



Seals for Fluid Power

Catalog 2007

Your Technology Specialist

simrit[®]

The information in this product catalog is based on the experience gained in decades of research on the development and manufacture of seals and components for vibration control in the Freudenberg group. It represents the current state of our knowledge.

The sealing effect of many products in the catalog is, however, not provided solely by the component. Indeed, in the specific application this effect depends on other parameters such as installation position and contact area, the pressure applied, operating temperature, media to be sealed, lubrication, vibration control-related effects and any ingress of dirt from the outside. This and other, unknown, factors in practical use can have a significant effect on the seals.

Against this background, general statements on the function of the products in the catalog are not possible. Information in this catalog only represents recommended values that are not correct

in every application. We therefore recommend you to discuss your specific application with our advisory service. In cases with high or special loads, for example due to aggressive media, the seal should be selected in collaboration with us; here trials on reliability are often indispensable.

In the context of product optimisation we reserve the right to change, without prior notice, the product range, production sites, products and their manufacturing process as well as the information in this catalog.

All previous issues become invalid on publication of this issue of the catalog.

Duplication in any form requires express approval from Freudenberg Simrit GmbH & Co. KG, 69465 Weinheim, Germany.

© Freudenberg Simrit GmbH & Co. KG
All rights reserved.

Simrit, Your Technology Specialist for Seals and Vibration Control



Simmering®



Fluid Power



Hydraulic Accumulator



O-Rings



Liquid Silicon Products



Special Sealing Products



Vibration Control

Our unique service package sets standards in quality, functionality and cost effectiveness throughout the industry.

With its comprehensive product range and large number of services, Simrit provides a service package unique in the market for almost every application. Simrit employs its leading technological expertise so that you benefit: We analyse your entire system and fine-tune the individual components to each other in an optimum way. This means you get exactly the solution that best fulfils your requirements – cost effective and dependable. Reinforced by single sourcing that saves time and costs, you will find that Simrit is your ideal partner for all sealing- and vibration-related applications when it comes to complex systems.

We have been the leading experts in materials for decades, and this is a significant factor for success, exceptional performance and continuous technological advancement of our products. Famous product names such as Simmering®, Merkel, Integral Accumulator, ISC O-Ring or Lederer reflect this. Together with the fields of special sealing products and vibration technology, they are inseparably connected with the Simrit brand name and constitute the world's largest product range for all applications throughout industry.

As part of the Freudenberg Group, we draw upon established research, development and production expertise within the Group to constantly extend our technological lead through innova-

tive solutions for the purposes of – and in the service of – our global customers with their local market requirements. The close international cooperation of Simrit in Europe and America with our Japanese partner, NOK, in Asia provides you with consistent quality standards wherever our solutions are required. And with Simrit Service Centers in all industrial markets, our global sales network supports you and more than 100,000 other customers dependably and on a basis of mutual trust and cooperation at sites in every continent.

The Simrit service package at a glance:

- **World's largest product range**
Comprehensive solutions from a single source
- **Continuous innovations**
Technological prominence for the competitive advantage of our customers
- **Unique expertise in materials and high quality standards**
Leading know-how for safe and cost-effective applications
- **A huge number of integrated services**
Support from development up to continuous product deployment
- **Globality**
Global expertise with the knowledge of local market requirements

Your Simrit Partner





Elastomers with Excellent Characteristics – the Basis of Innovative Solutions

Thorough know-how about materials for more than 60 years

Simrit has now been developing innovative branded products at the highest level for more than 60 years. With in-depth experience on materials, well-founded knowledge of processing and extensive product know-how, again and again we create ideal pre-conditions for your success. However, the quality of the elastomer material is decisive for the optimum operation of seals and components used in vibration control. Therefore, we are particularly proud of our pioneering role worldwide in this sector.

Deliberately targeted development of materials guarantees the highest possible quality and long life

More than 250 engineers and chemists worldwide are developing new materials every day for the highest possible functional requirements in joint development ventures with various research institutions plus leading manufacturers of polymers and chemicals. The materials we develop must fulfil the respective customer-specific requirements and withstand all the loadings feasible in their branch of industry – both with regard to temperature, pressure and resistance to media and in the presence of static or

dynamic loadings. The length of life of our products is constantly being improved by optimising our materials. Constant monitoring on the road to these products becoming mass production materials also guarantees you the highest possible quality.

The Individual Materials We have Developed are Leaders Worldwide

Uniquely wide range of standard materials

We produce more than a billion seals annually from a production volume of more than 15,000 tons. When considered as a whole, a range of material, which is unique in its quality and quantity, is available to you with more than 1,500 mixtures of 850 raw materials for your individual applications in seals and vibration control. A large proportion of these are standardised mixtures. Of course, our competent team of experts will advise and assist you fully – from the selection of the right materials via the test phase to the start of production.



Comprehensive performance package and much more

Materials manufactured individually to your wishes and requirements are unusually important in the comprehensive performance package from Simrit. The use of polymers, based on our own raw materials and tailored to your requirements, enables Simrit to develop high performance materials which satisfy the highest functional demands. We use our global materials database for the selection of application-specific materials, which groups together the know-how

of our experts, working worldwide, to form a network of top technological services which we can call on at any time. Finally, the appropriate material with the optimum characteristics for your application is manufactured using computer-controlled procedures, from the selection of the raw material to the compounding process. Of course, always adhering to the highest standards in quality and processing and complying with ecological guidelines – in the interests of your success and the environment.

Simrit Academy – Secure these Advantages for Your Success



The Simrit Academy offers you seminars which are tailored to your needs in terms of content and specialisation levels. There are numerous advantages for you.

A know-how advantage

You receive information from more than 20 qualified experts with regards to state of the art products and materials. Thus ensuring the correct selection of parts as well as smooth workflows in your production processes.

Individuality

Our seminar programme covers the needs of beginners and pros alike. The selection is extensive, allowing for a choice appropriate to the level of knowledge.

Practical relevance

Reinforcement of theoretical knowledge through practical exercises. At the same time we invite you to view our production and research facilities.

Productivity

With the knowledge that you have gained, you can increase your productivity by appropriately selecting the correct products and materials every time.

Languages

All attendance seminars are offered in both German and English. Simultaneous translation is available at every Innovations Forum.

Sustainability

For each Simrit Academy event, you will also receive comprehensive documentation to accompany the course information. Your participation is substantiated by DIN-ISO 9001 format seminar certificate.

Simrit Seminars

You visit our Academy on location in Weinheim and directly experience all materials and products yourself. In doing so, you can choose one of three different seminar categories.

Simrit Basic Seminar

Participants without previous technical knowledge can get to know the entire Simrit performance package.

Simrit Professional Seminar

Become an expert on Simrit and obtain detailed knowledge about all products, processes and materials. Both in theory and in practice.

Simrit Seminar Special

The course contents are highly specialised and concentrate on conveying knowledge related to a specific product or material area.

Innovation Forum

Interested parties learn about all the new Simrit innovations in this lecture series, and can exchange knowledge and experience with panels of experts and with other participants.



Registration

You can easily register for Simrit seminars at www.simrit.com/academy. Additional detailed information on registering and on the seminars can be found in the Simrit Academy Programme 2007 brochure, which you can order or download from www.simrit.com.



Merkel Xpress – The 24 hour Express-Service for Seals, Guides and Pivoting Parts

When it has to be there in a hurry: Merkel Xpress from Simrit. Our service delivers the desired seal within 24 hours.

With Merkel Xpress from Simrit you can minimise your machine down-time – and therefore production costs. At the same time, you can reduce the number of spare parts you keep in stock. After all, if you can order it at any time, you don't need to keep it in stock. Ask us: you'll have your seal tomorrow.

The seal you need

Whatever you need at short notice, we can produce it within a few hours using state-of-the-art production technology. Tailor-made to suit your requirements, from single seals for prototypes through to mass production in economical batch sizes. Merkel Xpress saves you shaping costs and minimum order quantities – by using new materials and thanks to our high-speed production and delivery systems.

Merkel Xpress offers you:

- Delivery within 24 hours
- Seals of up to 4 metres in diameter
- From single seals to mass production
- Wide range of profiles
- Original Simrit materials and geometries
- Plus special designs and special materials
- Leading production know-how
- Continuous development of the product range

Tailor-made. Immediately. Economically. The Triple Advantage of Merkel Xpress

Materials

Polyurethane:

SQ-PU

SQ-HPU

Further materials:

- For low-temperature ranges (down to -50°C)
- Self-lubricating properties
- With FDA approval

Elastomers:

SQ-NBR

SQ-HNBR

SQ-FKM (fluorelastomer)

SQ-EPDM*

SQ-SIL*

*Also with FDA approval (food safe)

Plastomers:

SQ-POM

SQ-PA

Fluoroplastic (PTFE):

SQ-WFLON (white, virginal)

SQ-GFLON (with 15% glass fibre, 5% MoS₂)

SQ-BFLON (with 40% bronze, or 60%)

SQ-CFLON (25% carbon)

Further qualities on request.



A flexible production concept for every requirement

With the newest generation of special lathes and software solutions developed to precisely satisfy customer demands, we can produce every machine-manufactured seal possible, quickly and economically. More than 260 pre-programmed seal design types serve as a basis for our efficient and rapid manufacturing processes. In this regard we work with both special materials such as PEEK and

FFKM, Original Simrit polyurethane and, of course, upon request every other market-standard material for your specific application. The perfect solution for:

- Non-standard seal and machined-part spare parts for every manufacturer
- Rapidly required standard seals
- Small-volume series of special seals
- Samples
- Substitute seals
- End-of-life design types whose series production will not be restarted

Further information can be found at www.simrit.com.

Realise Your Objectives
Quickly with www.simrit.com



Simrit Online – more than just a facelift. Thanks to a smart Navigation System – developed exactly to your requirements – the information you are looking for can be found about products and services with just a few mouse clicks.

The new online presence from Simrit, with integrated Smart Navigation, offers you a particularly easy and quick work platform for your Internet research. There's no quicker way for you to achieve your objective of getting solid expertise for your planning. Whether you need product information, material data sheets or want to access 3D-CAD data – in the user-friendly Simrit database you are sure to quickly find what you are looking for.

3D-CAD data – Download added value

With the 3D Download Service from Simrit you can reliably create your designs with visual clarity for your seal or vibration control solution. Including all technical details in three-dimensional display quality.

The new Simrit eCatalog

Up to 100.000 items accessible online and available within 24 hours. The new eCatalog in the Simrit portal makes it possible. And the best thing about it: The Simrit Product Navigator guides you in the easiest and most straightforward manner directly to the optimum product for your application. Find – compare – select. Convince yourself.

mySimrit – the easy, exclusive offering for smart online users

Register once – benefit continuously. As a registered user of the mySimrit customer area, you benefit from the continuously expanding service advantages. From initial query through product availability to quick CAD downloads and even accessing current news, you receive true added value for a minimum of registration effort. The best thing to do is test us today.



We speak your language:

As a worldwide leading technology specialist, of course we also make our Internet services available to you in your native language. Right from the start, our new online presence is represented in the national language of the most important industrial markets. And, we are continually expanding our portal for you.

Simrit on the Internet – your platform for successful business

- Smart navigation and full-text searches for rapid results
- An extensive eCatalog with more than 100.000 items
- Easy download function for 3D-CAD
- An overview of our brochure service by mouse click
- Availability query
- and much more



Table of Contents

A ● marks types to be preferably used with new designs

Design Types in Alphabetical Order _____ 14

Hydraulics

Rod Seals

Pre-Selection Rod Seals _____ 16

● Merkel U-Ring LF 300 _____	22
Merkel U-Ring NI 150 _____	26
Merkel U-Ring NI 250 _____	29
● Merkel U-Ring NI 300 _____	32
Merkel U-Ring NI 400 _____	38
● Merkel U-Ring T 20 _____	42
Merkel U-Ring T 22 _____	52
Merkel U-Ring T 23 _____	56
● Merkel U-Ring T 24 _____	59
● Merkel U-Ring TM 20 _____	62
Merkel U-Ring TM 23 _____	66
● Merkel U-Ring Syprim SM _____	70
Merkel U-Ring Seal Set 0214 _____	73
Merkel U-Ring Seal Set 0216 _____	76
● Merkel U-Ring TMP 20 _____	80
● Merkel Omegat OMS-MR _____	82
● Merkel Omegat OMS-MR PR _____	94
● Merkel Omegat OMS-S _____	100
● Merkel Omegat OMS-S PR _____	106
● Merkel Compact Seal KI 310 _____	110
● Merkel Compact Seal KI 320 _____	114
Merkel Compact Seal S 8 _____	117
Merkel Compact Seal TFMI _____	122
Merkel Chevron Seal Set ES, ESV _____	124
Chevron Seal Set made of PTFE _____	146
Packing Ring TFW made of PTFE _____	149
Merkel V-Packings V 1000 _____	153
Merkel Hat Seal H with Spring _____	186
Merkel Hat Seal H without Spring _____	189
Forseal FOI made of PTFE _____	192

Piston Seals

Pre-Selection Piston Seals _____ 194

Merkel U-Ring NA 150 _____	198
Merkel U-Ring NA 250 _____	201
● Merkel U-Ring NA 300 _____	205
Merkel U-Ring NA 400 _____	209

● Merkel U-Ring T 18 _____	213
● Merkel U-Ring TM 21 _____	217
● Merkel U-Ring TMP 21 _____	220
Merkel Compact Seal T 42 _____	223
Merkel Compact Seal T 44 _____	226
Merkel U-Ring Seal Set 0215 _____	229
Merkel U-Ring Seal Set 0217 _____	233
Merkel Omegat OMK-PU _____	237
● Merkel Omegat OMK-E _____	240
● Merkel Omegat OMK-ES _____	252
● Merkel Omegat OMK-MR _____	255
● Merkel Omegat OMK-S _____	267
Merkel Compact Seal Simko 300 _____	272
Merkel Compact Seal Simko 320 X2 _____	276
Merkel Compact Seal Simko 520 _____	278
Merkel Compact Seal L 27 _____	281
Merkel Compact Seal L 43 _____	284
Merkel Compact Seal T 19 _____	288
Merkel Compact Seal TFMA _____	290
Merkel Complete Piston TDUOH _____	293
Merkel Cup Packing T with Spring _____	296
Merkel Cup Packing T without Spring _____	300
Merkel Chevron Seal Set EK, EKV _____	307
Forseal FOA made of PTFE _____	313

Wipers

Pre-Selection Wipers _____ 316

Merkel Wiper AS _____	320
Merkel Wiper ASOB _____	324
● Merkel Wiper AUUPS _____	326
● Merkel Wiper AUAS _____	328
● Merkel Wiper AUAS R _____	331
Merkel Wiper AUASOB _____	333
Merkel Wiper P 6 _____	335
● Merkel Wiper PU 5 _____	339
● Merkel Wiper PU 6 _____	342
Merkel Wiper PU 7 _____	345
Merkel Double Wiper P 8 _____	348
Merkel Double Wiper P 9 _____	353
● Merkel Double Wiper PRW 1 with Integrated Pressure Relief _____	357
● Merkel Double Wiper PT 1 _____	360
● Merkel Double Wiper PT 2 _____	367
● Merkel Double Wiper PU 11 _____	372

Guides

Pre-Selection Guides	374
Merkel Guide Ring EKF	378
● Merkel Guide Ring FRA	381
● Merkel Guide Ring KB	384
● Merkel Guide Ring Guivex KBK	391
● Merkel Guide Strip KF	397
● Merkel Guide Ring FRI	406
● Merkel Guide Ring Guivex SBK	409
● Merkel Guide Ring SB	415
● Merkel Guide Strip SF	422

Profiles for Oscillating Applications	430
--	-----

Pre-Selection Other Seals	434
--	-----

Seals for Swivelling Movement

● Merkel Rotomatic M 15	438
● Merkel Rotomatic M 16	441
Merkel Rotomatic M 17	444
Merkel Rotomatic M 19	447

Radial and Axial Seals

Simmerring Radiamatic® EWDR made of PTFE	449
Simmerring Radiamatic® HTS II made of PTFE	451
Simmerring Radiamatic® R 35	455
Simmerring Radiamatic® R 36	463
Simmerring Radiamatic® R 37	467
Simmerring Radiamatic® R 58	472
Simmerring Radiamatic® R 35 LD	475
Simmerring Radiamatic® RS 85	477
Simmerring Radiamatic® RHS 51	479

Symmetric Seals

Merkel U-Ring N 1, AUN 1	481
Merkel U-Ring N 100, AUN 100	494

Static Seals

● Merkel Cover Seal PU 82	501
● Merkel Cover Seal PU 83	505
● Merkel Stircomatic SRC	509
ISC O-Ring	511

Fitting Tools as Mounting Auxiliaries	512
--	-----

Pneumatics

Pre-Selection Pneumatics	514
---------------------------------------	-----

Rod Seals

Merkel Combination Seal AU NIPSL	518
Merkel Combination Seal NIPSL	520
Merkel Combination Seal NIPSL 200	522
Merkel Combination Seal NIPSL 210	524
Merkel Combination Seal NIPSL 300	526
Merkel Combination Seal NIPSL 310	528
Merkel Combination Seal NIPSL 320	530
Merkel Combination Seal NIPSL SF	532
Merkel Compact Seal Airzet PR	534

Damper Seals

Merkel Damper Seal AU DIP	536
Merkel Damper Seal DIP	538

Piston Seals

Merkel U-Ring NAP 210	540
Merkel U-Ring NAP 300	542
Merkel U-Ring NAP 310	544
Merkel U-Ring NAPN	546
Merkel Compact Seal Airzet PK	548
Merkel Compact Seal KDN	550
Merkel Complete Piston NADUOP	552
Merkel Complete Piston Pneuko G	554
Merkel Complete Piston Pneuko M 210	556
Merkel Complete Piston Pneuko M 310	558
Merkel Complete Piston TDUOP	560
Merkel Complete Piston TDUOP with Venting Passages	562
Merkel Complete Piston TDUOP M	564

Guides

Merkel Guide Strip SF	566
Merkel Guide Ring EKF	574
Merkel Guide Strip KF	577

On the last pages you will find

Simrit Catalog Overview

Simrit Service Centers and Simrit Partners Worldwide

Design Types in Alphabetical Order

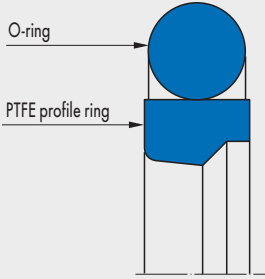
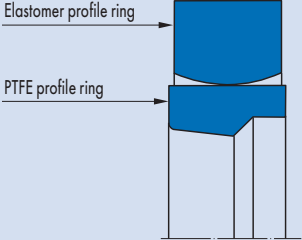
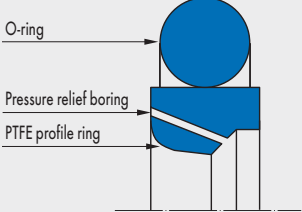
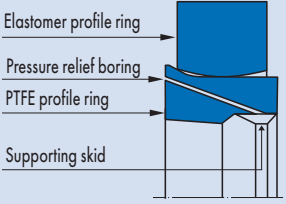
A		K	
Airzet PK	548	KB	384
Airzet PR	534	KDN	550
AS	320	KF	397, 577
ASOB	324	KI 310	110
AU DIP	536	KI 320	114
AU NIPSL	518		
AUAS R	331	L	
AUAS	328	L 27	281
AUASOB	333	L 43	284
AUN 1	481	LF 300	22
AUN 100	494		
AUPS	326		
C		M	
Chevron Seal Set made of PTFE	146	M 15	438
		M 16	441
		M 17	444
		M 19	447
D		N	
DIP	538	N 1	481
		N 100	494
		NA 150	198
		NA 250	201
		NA 300	205
		NA 400	209
		NADUOP	552
		NAP 210	540
		NAP 300	542
		NAP 310	544
		NAPN	546
		NI 150	26
		NI 250	29
		NI 300	32
		NI 400	38
		NIPSL	520
		NIPSL 200	522
		NIPSL 210	524
		NIPSL 300	526
		NIPSL 310	528
		NIPSL 320	530
		NIPSL SF	532
E			
EK, EKV	307		
EKF	378, 574		
ES, ESV	124		
F			
Fitting Tools as Mounting Auxiliaries	512		
Forseal FOA made of PTFE	313		
Forseal FOI made of PTFE	192		
FRA	381		
FRI	406		
G			
Guivex KBK	391		
Guivex SBK	409		
H			
H with Spring	186		
H without Spring	189		

O		S	
O-Ring	511	S 8	117
Omegat OMK-E	240	SB	415
Omegat OMK-ES	252	Seal Set 0214	73
Omegat OMK-MR	255	Seal Set 0215	229
Omegat OMK-PU	237	Seal Set 0216	76
Omegat OMK-S	267	Seal Set 0217	233
Omegat OMS-MR	82	SF	422, 566
Omegat OMS-MR PR	94	Simko 300	272
Omegat OMS-S	100	Simko 320 X2	276
Omegat OMS-S PR	106	Simko 520	278
		Stircomatic SRC	509
		Syprim SM	70
P		T	
P 6	335	T 18	213
P 8	348	T 19	288
P 9	353	T 20	42
Pneuko G	554	T 22	52
Pneuko M 210	556	T 23	56
Pneuko M 310	558	T 24	59
Profiles for Oscillating Applications	430	T 42	223
PRW 1 with Integrated Pressure Relief	357	T 44	226
PT 1	360	T with Spring	296
PT 2	367	T without Spring	300
PU 5	339	TDUOH	293
PU 6	342	TDUOP	560
PU 7	345	TDUOP with Venting Passages	562
PU 11	372	TDUOP M	564
PU 82	501	TFMA	290
PU 83	505	TFMI	122
		TFW made of PTFE	149
R		TM 20	62
Rdiamatic® EWDR aus PTFE	449	TM 21	217
Rdiamatic® HTS II aus PTFE	451	TM 23	66
Rdiamatic® R 35	455	TMP 20	80
Rdiamatic® R 35 LD	475	TMP 21	220
Rdiamatic® R 36	463		
Rdiamatic® R 37	467	V	
Rdiamatic® R 58	472	V 1000	153
Rdiamatic® RHS 51	479		
Rdiamatic® RS 85	477		

Pre-Selection Hydraulics – Rod Seals

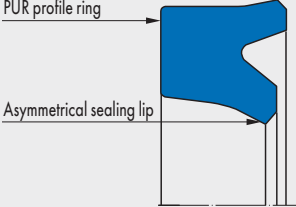
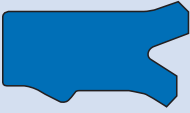
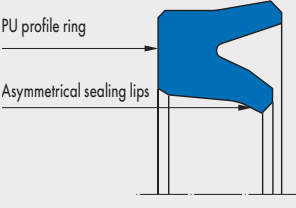
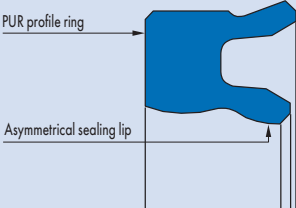
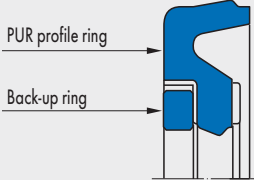
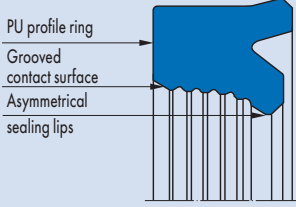
Temperature figures refer to mineral oils. Due to the large choice of media with different and varying additives, which is not always easily comprehensible, the above operating limits are only recommended values. We recommend testing resistance in the specific case.

Individual instances of the operating limits stated may be exceeded taking into account the related operating conditions. With a long duty cycle, stop-start operation or other difficult operating conditions it is recommended that these values are not simultaneously exploited to the full.

Seal		Standard	
Type	Material	DIN/ISO	Examples of use
<p>Merkel Omegat OMS-MR</p>  <p>O-ring PTFE profile ring</p>	<p>PTFE bronze NBR PTFE bronze FKM PTFE glass NBR</p>	<p>based on 7425/2</p>	<p>For high requirements in sealing systems, low friction, free of stick-slip, high temperature resistance/ high heat dissipation ability.</p>
<p>Merkel Omegat OMS-S</p>  <p>Elastomer profile ring PTFE profile ring</p>	<p>PTFE glass NBR</p>		<p>Very high resistance to pressure, specifically for heavy duty hydraulic applications, low friction, free of stick-slip, high contact pressure and design which prevents twisting through elastomer profile ring.</p>
<p>Merkel Omegat OMS-MR PR</p>  <p>O-ring Pressure relief boring PTFE profile ring</p>	<p>PTFE bronze NBR PTFE bronze FKM PTFE glass NBR</p>	<p>based on 7425/2</p>	<p>Patented pressure relief for high reliability, for high requirements in sealing systems, low friction, free of stick-slip, high temperature resistance/ heat dissipation ability.</p>
<p>Merkel Omegat OMS-S PR</p>  <p>Elastomer profile ring Pressure relief boring PTFE profile ring Supporting skid</p>	<p>PTFE bronze NBR PTFE glass NBR</p>		<p>Patented pressure relief for high reliability, specifically for heavy duty hydraulic applications, low friction, free of stick-slip, high temperature resistance/heat dissipation ability.</p>

● = very good; ◐ = good; ○ = possible or satisfactory; ⊗ = not suitable

	Function					Operating Limits		
	single-acting	double-acting	Individual seal	Primary seal	Secondary seal	Pressure (MPa)	Speed (m/s)	Temperature (°C)
	●	⊗	●	●		40	5	-30 ... +100
	●	⊗	●	●		40	5	-30 ... +100
	●	⊗		●	⊗	40	5	-30 ... +100
	●	⊗		●	⊗	40	5	-30 ... +100

Seal		Standard		
Type	Material	DIN/ISO	Examples of use	
Merkel U-Ring T 20  <p>PUR profile ring</p> <p>Asymmetrical sealing lip</p>	95 AU V142	5597/1	Optimal price/performance ratio.	
Merkel U-Ring T 24 	95 AU V142		Very good static and dynamic tightness, specifically for telescopic cylinders and for radially narrow housings.	
Merkel U-Ring TM 20  <p>PU profile ring</p> <p>Asymmetrical sealing lips</p>	95 AU V142		Very good static and dynamic tightness, low breakaway force, specifically for special sizes.	
Merkel U-Ring TMP 20  <p>PUR profile ring</p> <p>Asymmetrical sealing lip</p>	95 AU V167		High tightness, specifically for pneumatic applications.	
Merkel U-Ring Syprim SM  <p>PUR profile ring</p> <p>Back-up ring</p>	95 AU V142/POM	based on 5597/1	Standard buffer seal in sealing systems.	
Merkel U-Ring LF 300  <p>PU profile ring</p> <p>Grooved contact surface</p> <p>Asymmetrical sealing lips</p>	94 AU 925	5597/1	Low friction, optimised with regards to stick-slip behaviour, optimised with regards to hydrodynamic deformation value.	

● = very good; ● = good; ○ = possible or satisfactory; ⊗ = not suitable

	Function					Operating Limits		
	single-acting	double-acting	Individual seal	Primary seal	Secondary seal	Pressure (MPa)	Speed (m/s)	Temperature (°C)
	●	⊗	●	⊗	●	40	0,5 ... 0,8*	-30 ... +110
	●	⊗	●	⊗	●	40	0,5	-30 ... +110
	●	⊗	●	⊗	●	40	0,5	-30 ... +110
	●	⊗	●	⊗	●	2	1,5	-10 ... +80
	●	⊗		●	⊗	40	0,5	-30 ... +110
	●	⊗	●	⊗	●	32	0,6 ... 0,8*	-30 ... +110

Seal		Standard		
Type	Material	DIN/ISO	Examples of use	
<p>Merkel U-Ring NI 300</p> <p>Asymmetrical sealing lips PUR profile ring Sealing edge</p>	94 AU 925	5597/1	Additional protection against dirt intrusion.	
<p>Merkel U-Ring KI 310</p> <p>PU profile ring Sealing lips</p>	94 AU 925	5597/1	For narrow housings, high sealing effect at low pressures.	
<p>Merkel U-Ring KI 320</p> <p>PU profile ring Back-up rings Support edge</p>	94 AU 925/POM	5597/1	For high pressures and large gap widths.	

● = very good; ◐ = good; ○ = possible or satisfactory; ⊗ = not suitable

	Function					Operating Limits		
	single-acting	double-acting	Individual seal	Primary seal	Secondary seal	Pressure (MPa)	Speed (m/s)	Temperature (°C)
	●	⊗	●	⊗	●	40	0,5	-30 ... +110
	●	⊗	●	⊗	●	40	0,5	-30 ... +110
	●	⊗	●	⊗	●	50	0,5	-30 ... +110

Merkel U-Ring LF 300

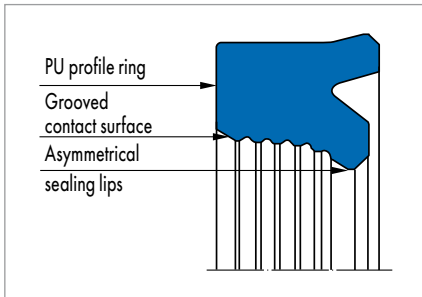


Fig. 1 Merkel U-Ring LF 300

Product description

Merkel U-ring with asymmetrical profile, inner lip set back, grooved contact surface on the inside diameter as well as press fit at the outside diameter.

Product advantages

Single-acting rod seal for standardised housings, amongst others, according to ISO 5597

- Very good static and dynamic tightness
- Low friction, smooth movement even at low running speeds, dynamic deformation value
- Use as an individual seal or secondary seal in sealing systems possible.

Application

Earth moving equipment, agricultural machinery, injection moulding machines, industrial vehicles, cranes, loading platforms.

Material

Material	Code	Hardness
Polyurethane	94 AU 925	94 Shore A
Polyurethane	92 AU 21100	92 Shore A

Operating conditions

Material	94 AU 925	92 AU 21100
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +110	-40 ... +100
HFA fluids	+5 ... +50	+5 ... +50
HFB fluids	+5 ... +50	+5 ... +50
HFC fluids	-30 ... +40	-40 ... +40
HFD fluids	-	-
Water	+5 ... +40	+5 ... +40
HETG (rapeseed oil)	-30 ... +60	-40 ... +60
HEES (synthetic ester)	-30 ... +60	-40 ... +80
HEPG (glycol)	-30 ... +40	-40 ... +40
Mineral greases	-30 ... +110	-40 ... +100
Pressure p in MPa	32	32
Running speed v in m/s	0,6	0,6

If the U-ring LF 300 is used as a secondary seal, running speeds up to 0,8 m/s can be allowed.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area Mr >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design Notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile	Max. permissible gap dimension		
	16 MPa	26 MPa	32 MPa
4,0 ... 5,0	0,50	0,40	0,35
>5,0 ... 7,5	0,55	0,45	0,40

Tolerance recommendation and dimension D2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

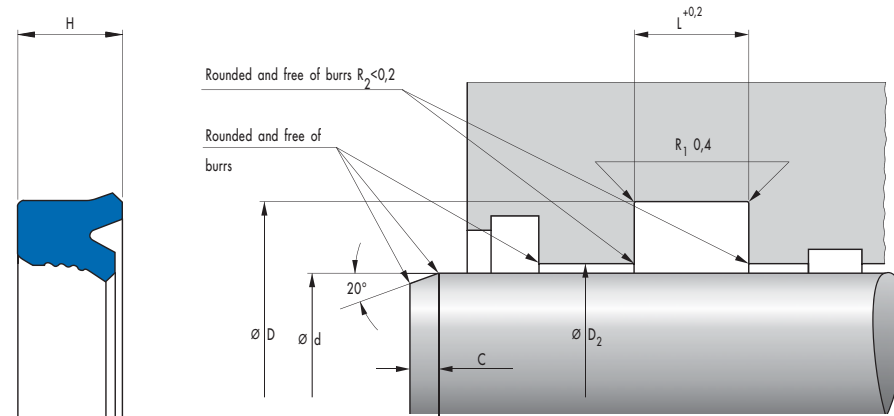
Nominal Ø d	d	D
≤180	f8	H11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
16	24	5,7	6,3	4	4		ISO	92 AU 21100	49016129	○
19	27	5,7	6,3	4	4			92 AU 21100	49016138	○
20	28	5,7	6,3	4	4		ISO	94 AU 925	521486	●
22	30	5,7	6,3	4	4		ISO	94 AU 925	521689	●
22	30	5,7	6,3	4	4	W		92 AU 21100	49024530	○
22	32	7,3	8	5	4,5	W	ISO	92 AU 21100	49024552	○
25	33	5,7	6,3	4	4	W	ISO	94 AU 925	521690	●
25	35	7,3	8	5	4,5		ISO	94 AU 925	530049	●
25	35	7,3	8	5	4,5		ISO	92 AU 21100	49024528	○
26	36	7,3	8	5	4,5			94 AU 925	530050	●
26	36	7,3	8	5	4,5	W		92 AU 21100	49024536	○
28	36	5,7	6,3	4	4	W		94 AU 925	521691	●
28	38	7,3	8	5	4,5		ISO	94 AU 925	522296	●
28	38	7,3	8	5	4,5		ISO	92 AU 21100	49024467	○
30	38	5,7	6,3	4	4	W		94 AU 925	521693	●
30	40	7,3	8	5	4,5	W	ISO	92 AU 21100	49032530	○
30	40	7,3	8	5	4,5	W		94 AU 925	530774	●
32	40	5,7	6,3	4	4	W		94 AU 925	530051	○
32	40	5,7	6,3	4	4	W		92 AU 21100	49024532	○
32	42	7,3	8	5	4,5	W	ISO	94 AU 925	521694	●
32	42	7,3	8	5	4,5	W	ISO	92 AU 21100	49024534	○
35	43	5,7	6,3	4	4	W		94 AU 925	530052	●
35	43	5,7	6,3	4	4	W		92 AU 21100	49024468	○
35	45	7,3	8	5	4,5	W		94 AU 925	521706	●
35	45	7,3	8	5	4,5	W		92 AU 21100	49024470	○
36	46	7,3	8	5	4,5	W	ISO	94 AU 925	521695	●
37	47	7,3	8	5	4,5	W		94 AU 925	522297	○
38	48	7,3	8	5	4,5	W		92 AU 21100	49024506	○
40	50	7,3	8	5	4,5	W	ISO	94 AU 925	521696	●
40	50	7,3	8	5	4,5	W	ISO	92 AU 21100	49024505	○
43	53	7,3	8	5	4,5	W		94 AU 925	530053	○
45	55	7,3	8	5	4,5	W	ISO	92 AU 21100	49042413	○
45	55	7,3	8	5	4,5	W	ISO	94 AU 925	521697	●
46	56	7,3	8	5	4,5	W		94 AU 925	530054	●
46	56	7,3	8	5	4,5	H		92 AU 21100	49024504	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
48	58	7,3	8	5	4,5	W		94 AU 925	526668	●
50	58	5,7	6,3	4	4	H		94 AU 925	522298	●
50	60	7,3	8	5	4,5	H	ISO	94 AU 925	522299	●
50	60	7,3	8	5	4,5	H	ISO	92 AU 21100	49016892	○
52	62	7,3	8	5	4,5	H		92 AU 21100	49024503	○
52	62	7,3	8	5	4,5	W		94 AU 925	530055	○
55	65	7,3	8	5	4,5	H		94 AU 925	521698	●
55	65	7,3	8	5	4,5	H		92 AU 21100	49022143	○
56	71	11,4	12,5	7,5	5,5	W	ISO	94 AU 925	521699	●
58	68	7,3	8	5	4,5	H		94 AU 925	522300	○
58	68	7,3	8	5	4,5	H		92 AU 21100	49024465	○
60	70	7,3	8	5	4,5	W		94 AU 925	524196	●
60	70	7,3	8	5	4,5	H		92 AU 21100	49024502	○
60	75	11,4	12,5	7,5	5,5	W		94 AU 925	521700	●
63	73	7,3	8	5	4,5	H		92 AU 21100	49024501	○
63	78	11,4	12,5	7,5	5,5	W	ISO	94 AU 925	521701	●
65	75	7,3	8	5	4,5	W		94 AU 925	529093	●
68	78	7,3	8	5	4,5	W		94 AU 925	530059	○
68	78	7,3	8	5	4,5	H		92 AU 21100	49024493	○
70	80	7,3	8	5	4,5	W		94 AU 925	530778	●
70	80	7,3	8	5	4,5	H		92 AU 21100	49024492	○
70	85	11,4	12,5	7,5	5,5	W	ISO	92 AU 21100	49044882	○
70	85	11,4	12,5	7,5	5,5	W	ISO	94 AU 925	521702	●
77	87	7,3	8	5	4,5	W		94 AU 925	530060	●
77	87	7,3	8	5	4,5	H		92 AU 21100	49024459	○
80	90	7,3	8	5	4,5	W		94 AU 925	530062	●
80	95	11,4	12,5	7,5	5,5	H	ISO	94 AU 925	521703	●
80	95	11,4	12,5	7,5	5,5	H	ISO	92 AU 21100	49024458	○
85	100	11,4	12,5	7,5	5,5	W		94 AU 925	530064	●
85	100	11,4	12,5	7,5	5,5	H		92 AU 21100	49024457	○
90	105	11,4	12,5	7,5	5,5	H	ISO	94 AU 925	521705	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring NI 150

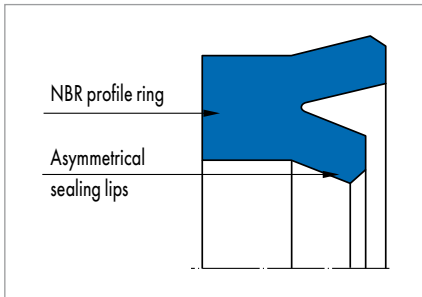


Fig. 1 Merkel U-Ring NI 150

Product description

Merkel U-ring with asymmetrical profile of the sealing lips.

Product advantages

Single-acting rod seal, for applications such as standardised housings according to ISO 5597; preferably for spare parts requirements.

Application

Earth moving equipment, mobile hydraulics, agricultural machinery.

Material

Material	Code	Hardness
Nitrile rubber	80 NBR 878	80 Shore A

Operating conditions

Material	80 NBR B246/BI-NBR B4B248/POM PO202
Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic ester)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	10
Running speed v in m/s	0,5

* max. pressure depends on the profile.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile	Max. permissible gap dimension			
	2,5 MPa	5 MPa	7,5 MPa	10 MPa
≤5	0,45	0,30	0,25	0,20
>5	0,50	0,35	0,30	0,25

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

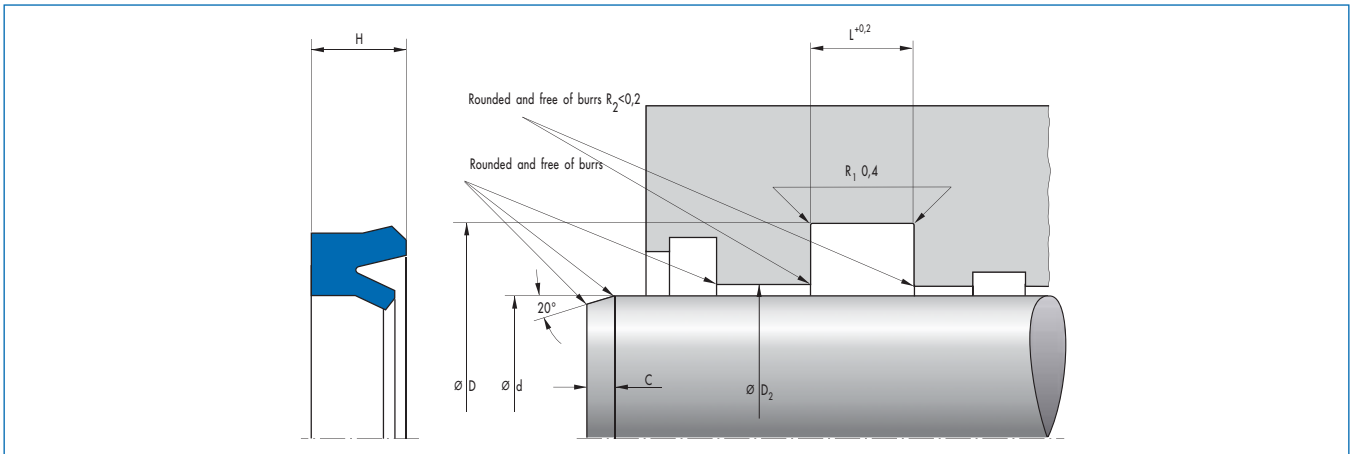
Nominal Ø d	d	D
≤180	f8	H11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
6	12	4	4,5	3	3,5			80 NBR M00878	84531	●
8	14	4	4,5	3	3,5			80 NBR M00878	84532	●
8	16	5,5	6	4	3,5		ISO	80 NBR M00878	84533	●
10	18	5,5	6	4	3,5		ISO	80 NBR M00878	84534	●
12	20	5,5	6	4	3,5		ISO	80 NBR M00878	84535	●
14	22	5,5	6	4	3,5		ISO	80 NBR M00878	84536	●
16	24	5,5	6	4	4		ISO	80 NBR M00878	84537	●
18	25	4,5	5	3,5	4			80 NBR M00878	84538	●
20	28	5,5	6	4	4	W	ISO	80 NBR M00878	84539	●
22	30	5,5	6	4	4	W	ISO	80 NBR M00878	84540	●
25	35	7	7,5	5	4,5	W	ISO	80 NBR M00878	84541	●
28	36	5,5	6	4	4	H		80 NBR M00878	84542	●
32	42	7	7,5	5	4,5	W	ISO	80 NBR M00878	84543	●
36	46	7	7,5	5	4,5	H	ISO	80 NBR M00878	84544	●
40	50	7	7,5	5	4,5	H	ISO	80 NBR M00878	84545	●
45	55	7	7,5	5	4,5	H	ISO	80 NBR M00878	84546	●
50	60	7	7,5	5	4,5	H	ISO	80 NBR M00878	84547	●
56	68	8,5	9,5	6	5	H		80 NBR M00878	84548	●
60	72	8,5	9,5	6	5	H		80 NBR M00878	84549	●
63	75	8,5	9,5	6	5	H		80 NBR M00878	84550	●
70	82	8,5	9,5	6	5	H		80 NBR M00878	84551	●
80	92	8,5	9,5	6	5	H		80 NBR M00878	84552	●
90	102	8,5	9,5	6	5	H		80 NBR M00878	84553	●
100	115	10	11	7,5	5,5	H		80 NBR M00878	84554	●
110	130	14	15	10	6	H	ISO	80 NBR M00878	84555	○
125	145	14	15	10	6	H	ISO	80 NBR M00878	84556	○
140	160	14	15	10	6	H		80 NBR M00878	84557	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring NI 250

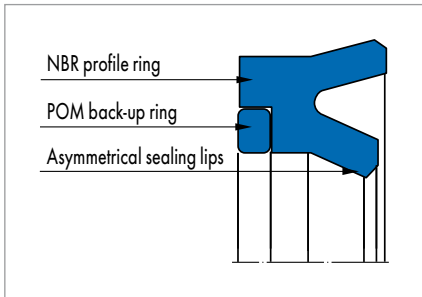


Fig. 1 Merkel U-Ring NI 250

Product description

Merkel U-ring with asymmetrical profile of the sealing lips and back-up ring as a gap sealing component.

Product advantages

Single-acting rod seal for medium loads, predominantly for spare parts requirements.

Application

Special cylinders, earth moving equipment, excavators, forestry equipment.

Material

Sealing component

Material	Code	Hardness
Nitrile rubber NBR	80 NBR 878	80 Shore A

Back-up ring

Material	Code
Polyacetal	POM 992020

Operating conditions

Material	80 NBR 878/POM
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic ester)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	25
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_p >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile	Max. permissible gap dimension		
	7,5 MPa	10 MPa	25 MPa
≤80	0,95	0,80	0,60
>80	1,00	0,85	0,65

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

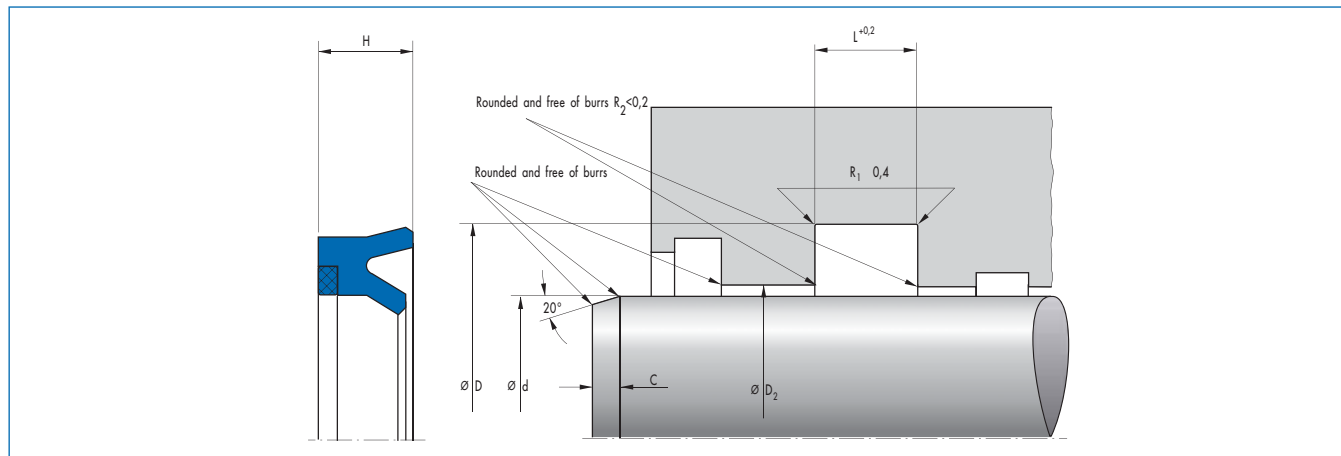
Nominal Ø d	d	D
≤120	f8	H11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



d	D	H	L	Profile	C	Fitting	Material	Article No.	
20	30	10	11	5	4		80 NBR M00878	18369	●
20	35	10	11	7,5	5,5		80 NBR M00878	18370	●
22	35	10	11	6,5	5,5		80 NBR M00878	18371	●
25	40	10	11	7,5	5,5		80 NBR M00878	18375	●
28	43	10	11	7,5	5,5		80 NBR M00878	18422	●
30	45	10	11	7,5	5,5		80 NBR M00878	18381	●
32	45	10	11	6,5	5,5		80 NBR M00878	18386	●
35	50	10	11	7,5	5,5		80 NBR M00878	18389	●
36	51	10	11	7,5	5,5		80 NBR M00878	18423	○
38	58	12	13	10	6		80 NBR M00878	18394	○
40	55	10	11	7,5	5,5	W	80 NBR M00878	18396	●
40	60	12	13	10	6		80 NBR M00878	18397	○
42	62	12	13	10	6		80 NBR M00878	18398	○
45	60	10	11	7,5	5,5	W	80 NBR M00878	18399	●
45	65	12	13	10	6		80 NBR M00878	18400	○
48	68	12	13	10	6	W	80 NBR M00878	18401	○
50	65	10	11	7,5	5,5	H	80 NBR M00878	18402	●
50	70	12	13	10	6		80 NBR M00878	18403	●
52	72	12	13	10	6	W	80 NBR M00878	18405	○
55	70	12	13	7,5	5,5	H	80 NBR M00878	18406	●
55	75	12	13	10	6	W	80 NBR M00878	18407	○
56	71	12	13	7,5	5,5	H	80 NBR M00878	18424	○
60	75	12	13	7,5	5,5	H	80 NBR M00878	18408	○
60	80	12	13	10	6	H	80 NBR M00878	18409	○
63	78	12	13	7,5	5,5	H	80 NBR M00878	18425	●
65	80	12	13	7,5	5,5	H	80 NBR M00878	18411	●
70	85	12	13	7,5	5,5	H	80 NBR M00878	18413	●
80	100	15	16	10	6	H	80 NBR M00878	5285	●
90	110	15	16	10	6	H	80 NBR M00878	31860	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring NI 300

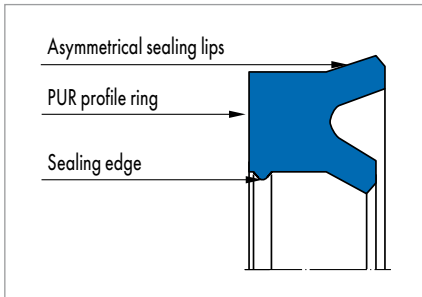


Fig. 1 Merkel U-Ring NI 300

Product description

Merkel U-ring with asymmetrical profile, inner lip set back, additional support edge and sealing edge as well as press fit at the outside diameter.

Product advantages

Single-acting rod seal for standardised housings, amongst others, according to ISO 5597

- Very good static and dynamic tightness
- Additional sealing edge, prevents ingress of dirt to a large degree
- Recommended for use in combination with single-acting wipers.

Application

Earth moving equipment, support cylinders, cranes, presses.

Material

Material	Code	Hardness
Polyurethane	94 AU 925	94 Shore A

Operating conditions

Material	94 AU 925
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +40
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic ester)	-30 ... +60
HEPG (glycol)	-30 ... +40
Mineral greases	-30 ... +110
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile	Max. permissible gap dimension			
	16 MPa	26 MPa	32 MPa	40 MPa
4,0 ... 5,0	0,50	0,40	0,35	0,30
>5,0 ... 7,5	0,55	0,45	0,40	0,35
>7,5 ... 12,5	0,66	0,50	0,45	0,40
>12,5	0,60	0,55	0,50	0,45

Tolerance recommendation and dimension d2

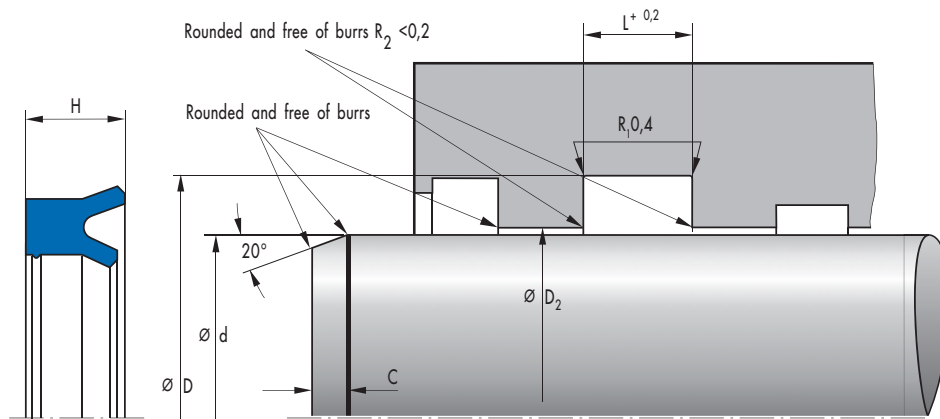
The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

Nominal Ø d	d	D
4 ... 260	f8	H11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
10	20	8	9	5	4			94 AU P00925	21258	●
12	20	5,5	6,3	4	3,5		ISO	94 AU P00925	337339	●
12	20	8	9	4	3,5			94 AU P00925	68421	●
12	22	7	8	5	4		ISO	94 AU P00925	337340	○
12	22	8	9	5	4			94 AU P00925	21261	●
14	22	5,5	6,3	4	3,5		ISO	94 AU P00925	435813	○
14	24	8	9	5	4			94 AU P00925	21263	●
15	25	8	9	5	4			94 AU P00925	21265	●
16	24	5,5	6,3	4	4		ISO	94 AU P00925	337342	●
16	26	8	9	5	4,5			94 AU P00925	18733	●
18	26	5,5	6,3	4	4		ISO	94 AU P00925	364610	●
18	26	8	9	4	4			94 AU P00925	81789	○
18	28	8	9	5	4,5			94 AU P00925	21266	●
20	28	5,5	6,3	4	4		ISO	94 AU P00925	337344	●
20	30	8	9	5	4,5			94 AU P00925	18735	●
20	30	10	11	5	4,5			94 AU P00925	21269	●
20	35	10	11	7,5	5,5			94 AU P00925	401667	○
22	30	5,5	6,3	4	4		ISO	94 AU P00925	429357	○
22	32	7	8	5	4,5		ISO	94 AU P00925	381991	○
22	32	8	9	5	4,5			94 AU P00925	21271	●
22	32	10	11	5	4,5			94 AU P00925	21272	●
22	35	10	11	6,5	5,5			94 AU P00925	401668	○
23	35	10	11	6	5			94 AU P00925	336462	○
25	33	5,5	6,3	4	4	W	ISO	94 AU P00925	337346	●
25	35	8	9	5	4,5			94 AU P00925	21274	●
25	35	10	11	5	4,5			94 AU P00925	21275	●
25	40	10	11	7,5	5,5			94 AU P00925	18741	●
25	45	12	13	10	6			94 AU P00925	401770	○
26	36	10	11	5	4,5			94 AU P00925	370114	●
28	36	8	9	4	4	W		94 AU P00925	5148	●
28	38	7	8	5	4,5			94 AU P00925	319964	○
28	38	8	9	5	4,5			94 AU P00925	21280	●
28	38	10	11	5	4,5			94 AU P00925	21282	●
28	43	10	11	7,5	5,5			94 AU P00925	21285	○
30	38	6	7	4	4	W		94 AU P00925	429363	○

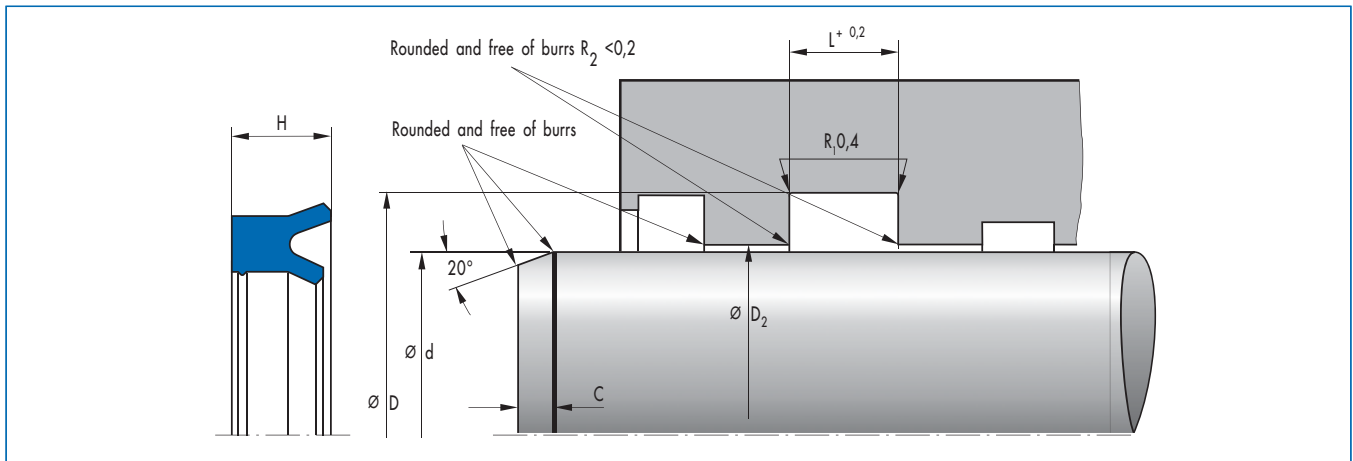
● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
30	40	10	11	5	4,5	W		94 AU P00925	21286	●
30	45	10	11	7,5	5,5			94 AU P00925	21305	●
30	50	12	13	10	6			94 AU P00925	401781	○
32	40	5,5	6,3	4	4	W		94 AU P00925	406663	○
32	40	6,5	7,5	4	4	W		94 AU P00925	315748	●
32	40	8	9	4	4	W		94 AU P00925	429370	●
32	42	10	11	5	4,5	W		94 AU P00925	21306	●
32	45	10	11	6,5	5,5			94 AU P00925	401826	●
32	47	10	11	7,5	5,5			94 AU P00925	21307	●
35	43	6	7	4	4	W		94 AU P00925	429378	○
35	45	10	11	5	4,5	W		94 AU P00925	18756	●
35	50	10	11	7,5	5,5			94 AU P00925	18759	●
36	44	6	7	4	4	W		94 AU P00925	429359	○
36	46	7	8	5	4,5	W	ISO	94 AU P00925	319965	●
36	46	10	11	5	4,5	W		94 AU P00925	21315	●
36	51	10	11	7,5	5,5			94 AU P00925	21317	●
36	56	12	13	10	6			94 AU P00925	21324	●
37	47	8	9	5	4,5	W		94 AU P00925	368268	●
37	47	10	11	5	4,5	W		94 AU P00925	375755	●
38	55	10	11	8,5	6			94 AU P00925	401832	○
40	48	8	9	4	4	H		94 AU P00925	429264	○
40	50	7	8	5	4,5	H	ISO	94 AU P00925	319563	●
40	50	10	11	5	4,5	H		94 AU P00925	18760	●
40	55	10	11	7,5	5,5			94 AU P00925	21326	●
40	55	11,5	12,5	7,5	5,5		ISO	94 AU P00925	337351	○
40	60	12	13	10	6			94 AU P00925	21338	●
42	52	10	11	5	4,5	H		94 AU P00925	116182	●
43	53	10	11	5	4,5	H		94 AU P00925	413930	○
45	55	7	8	5	4,5	H	ISO	94 AU P00925	429849	●
45	55	10	11	5	4,5	H		94 AU P00925	18763	●
45	60	10	11	7,5	5,5			94 AU P00925	18764	●
45	60	11,5	12,5	7,5	5,5		ISO	94 AU P00925	381990	○
45	65	12	13	10	6			94 AU P00925	21339	○
46	56	10	11	5	4,5	H		94 AU P00925	413959	○
50	58	8	9	4	4	H		94 AU P00925	429254	○
50	59	8	9	4,5	4,5	H		94 AU P00925	420826	●
50	60	10	11	5	4,5	H		94 AU P00925	18765	●
50	65	10	11	7,5	5,5	W		94 AU P00925	21344	●
50	65	11,5	12,5	7,5	5,5	W		94 AU P00925	457406	○
50	70	12	13	10	6			94 AU P00925	21349	●
52	62	10	11	5	4,5	H		94 AU P00925	112670	●
55	63	8	9	4	4	H		94 AU P00925	523147	○
55	65	8	9	5	4,5	H		94 AU P00925	384050	○
55	65	10	11	5	4,5	H		94 AU P00925	21357	●
55	65	12	13	5	4,5	H		94 AU P00925	21361	●
55	70	10	11	7,5	5,5	W		94 AU P00925	18766	●
55	70	12	13	7,5	5,5	W		94 AU P00925	21364	●
55	75	12	13	10	6			94 AU P00925	21365	○
56	66	10	11	5	4,5	H		94 AU P00925	21368	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing



d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
56	71	10	11	7,5	5,5	W		94 AU P00925	21374	●
56	76	12	13	10	6			94 AU P00925	21379	○
58	68	10	11	5	4,5	H		94 AU P00925	472965	○
60	70	10	11	5	4,5	H		94 AU P00925	18771	●
60	70	12	13	5	4,5	H		94 AU P00925	21386	●
60	75	10	11	7,5	5,5	W		94 AU P00925	21391	●
60	75	11,5	12,5	7,5	5,5	W		94 AU P00925	531745	○
60	75	12	13	7,5	5,5	W		94 AU P00925	21395	●
60	80	12	13	10	6			94 AU P00925	18772	●
63	73	12	13	5	4,5	H		94 AU P00925	21396	●
63	78	10	11	7,5	5,5	W		94 AU P00925	21406	●
63	83	12	13	10	6			94 AU P00925	21407	●
65	75	12	13	5	4,5	H		94 AU P00925	21420	●
65	80	12	13	7,5	5,5	W		94 AU P00925	21429	●
65	85	12	13	10	6			94 AU P00925	18773	●
68	78	12	13	5	4,5	H		94 AU P00925	380798	○
70	80	12	13	5	4,5	H		94 AU P00925	21430	●
70	85	10	11	7,5	5,5	W		94 AU P00925	18776	●
70	85	11,5	12,5	7,5	5,5	W	ISO	94 AU P00925	319968	○
70	85	12	13	7,5	5,5	W		94 AU P00925	21438	●
70	90	12	13	10	6			94 AU P00925	18777	●
75	85	12	13	5	4,5	H		94 AU P00925	21440	●
75	90	10	11	7,5	5,5	W		94 AU P00925	21446	●
75	90	12	13	7,5	5,5	W		94 AU P00925	18779	●
77	87	12	13	5	4,5	H		94 AU P00925	369026	○
80	90	10	11	5	4,5	H		94 AU P00925	127310	○
80	90	12	13	5	4,5	H		94 AU P00925	21447	●
80	95	10	11	7,5	5,5	H		94 AU P00925	21454	●
80	95	12	13	7,5	5,5	H		94 AU P00925	21455	●
80	100	12	13	10	6	W		94 AU P00925	18781	●
80	100	15	16	10	6	W	ISO	94 AU P00925	337358	○
85	95	12	13	5	4,5	H		94 AU P00925	432307	○
85	100	12	13	7,5	5,5	H		94 AU P00925	21466	●
85	105	12	13	10	6	W		94 AU P00925	21472	○
90	100	12	13	5	4,5	H		94 AU P00925	29310	○
90	105	11,5	12,5	7,5	5,5	H	ISO	94 AU P00925	344874	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
90	105	12	13	7,5	5,5	H		94 AU P00925	21474	●
90	110	12	13	10	6	W		94 AU P00925	18786	●
95	110	12	13	7,5	5,5	H		94 AU P00925	335953	○
95	115	12	13	10	6	W		94 AU P00925	324248	●
100	115	12	13	7,5	5,5	H		94 AU P00925	21482	●
100	120	12	13	10	6	W		94 AU P00925	18789	●
100	120	15	16	10	6	W	ISO	94 AU P00925	21483	●
100	125	15	16	12,5	6,5	W		94 AU P00925	401873	○
110	125	15	16	7,5	5,5	H		94 AU P00925	30970	●
110	130	12	13	10	6	W		94 AU P00925	21849	●
110	130	15	16	10	6	W	ISO	94 AU P00925	21486	●
110	135	15	16	12,5	6,5	W		94 AU P00925	401889	○
115	140	15	16	12,5	6,5	W		94 AU P00925	407165	○
120	135	15	16	7,5	5,5	H		94 AU P00925	21493	●
120	140	12	13	10	6	W		94 AU P00925	21497	●
120	140	15	16	10	6	W		94 AU P00925	21500	●
125	145	12	13	10	6	H		94 AU P00925	21852	●
125	145	15	16	10	6	H	ISO	94 AU P00925	21501	●
125	150	15	16	12,5	6,5	W		94 AU P00925	401892	○
125	155	18	19	15	7,5	W		94 AU P00925	21505	○
130	150	12	13	10	6	H		94 AU P00925	21511	●
130	150	15	16	10	6	H		94 AU P00925	21514	●
140	160	12	13	10	6	H		94 AU P00925	21516	●
140	160	15	16	10	6	H	ISO	94 AU P00925	21518	●
140	165	15	16	12,5	6,5	W		94 AU P00925	401895	○
140	170	18	19	15	7,5	W		94 AU P00925	21520	○
150	170	15	16	10	6	H		94 AU P00925	18792	●
150	180	18	19	15	7,5	W		94 AU P00925	21522	○
160	180	15	16	10	6	H		94 AU P00925	21538	●
160	185	15	16	12,5	6,5	H	ISO	94 AU P00925	401896	●
170	190	15	16	10	6	H		94 AU P00925	21561	●
180	200	15	16	10	6	H		94 AU P00925	18793	●
180	205	15	16	12,5	6,5	H	ISO	94 AU P00925	401907	○
180	210	18	19	15	7,5	W		94 AU P00925	21569	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring NI 400

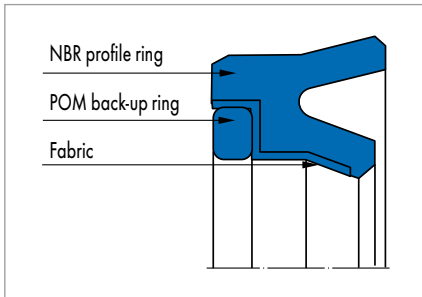


Fig. 1 Merkel U-Ring NI 400

Product description

Merkel U-ring with asymmetrical profile of the sealing lips, fabric reinforcement on the dynamic sealing side and back-up ring as a gap sealing component.

Product advantages

Single-acting rod seal for medium loads, predominantly for spare parts requirements.

Application

Heavy duty earth moving equipment, industrial vehicles, presses, control and regulation equipment.

Material

Sealing component

Material	Code	Hardness
Nitrile rubber NBR	80 NBR 878	80 Shore A

Back-up ring

Material	Code
Polyacetal	POM 992020

Operating conditions

Material	80 NBR 878/POM
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic ester)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_p >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile	Max. permissible gap dimension			
	16 MPa	26 MPa	32 MPa	40 MPa
≤80	0,60	0,50	0,40	0,35
>80	0,65	0,55	0,45	0,40

Tolerance recommendation and dimension D2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

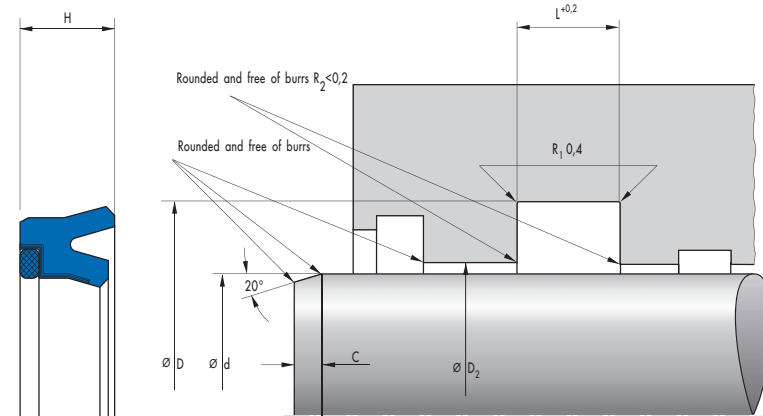
Nominal Ø d	d	D
≤360	f8	H11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



d	D	H	L	Profile	C	Fitting	Material	Article No.	
20	30	8	9	5	4,5		80 NBR M00878	24338	●
20	35	10	11	7,5	5,5		80 NBR M00878	24341	○
22	32	8	9	5	4,5		80 NBR M00878	24349	○
25	35	8	9	5	4,5		80 NBR M00878	24398	●
25	40	10	11	7,5	5,5		80 NBR M00878	24408	○
28	38	8	9	5	4,5		80 NBR M00878	24426	○
30	45	10	11	7,5	5,5		80 NBR M00878	4450	●
32	47	10	11	7,5	5,5		80 NBR M00878	24466	●
35	50	10	11	7,5	5,5		80 NBR M00878	3967	○
36	51	10	11	7,5	5,5		80 NBR M00878	24467	●
40	55	10	11	7,5	5,5		80 NBR M00878	24468	●
40	60	12	13	10	6		80 NBR M00878	24479	○
45	60	10	11	7,5	5,5		80 NBR M00878	24489	●
45	65	12	13	10	6		80 NBR M00878	24541	○
50	65	10	11	7,5	5,5		80 NBR M00878	24575	●
50	70	12	13	10	6		80 NBR M00878	24591	●
55	75	12	13	10	6		80 NBR M00878	4459	○
56	71	10	11	7,5	5,5	W	80 NBR M00878	24600	○
60	75	10	11	7,5	5,5	W	80 NBR M00878	3612	●
60	80	12	13	10	6		80 NBR M00878	30007	○
63	78	10	11	7,5	5,5	W	80 NBR M00878	24619	○
63	83	12	13	10	6		80 NBR M00878	24624	○
65	85	12	13	10	6		80 NBR M00878	4479	○
70	85	10	11	7,5	5,5	W	80 NBR M00878	24632	●
70	90	12	13	10	6		80 NBR M00878	24633	●
75	90	10	11	7,5	5,5	W	80 NBR M00878	30946	○
80	95	10	11	7,5	5,5	W	80 NBR M00878	24638	●
80	100	12	13	10	6	W	80 NBR M00878	24647	●
80	105	15	16	12,5	6,5		80 NBR M00878	24648	○
90	110	12	13	10	6	W	80 NBR M00878	24651	●
90	115	15	16	12,5	6,5	H	80 NBR M00878	24655	○
100	120	12	13	10	6	W	80 NBR M00878	24670	●
100	125	15	16	12,5	6,5	W	80 NBR M00878	24721	○
110	130	12	13	10	6	H	80 NBR M00878	24722	○
110	135	15	16	12,5	6,5	W	80 NBR M00878	24724	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

d	D	H	L	Profile	C	Fitting	Material	Article No.	
115	140	15	16	12,5	6,5	W	80 NBR M00878	24225	○
125	145	12	13	10	6	H	80 NBR M00878	24725	●
125	150	15	16	12,5	6,5	W	80 NBR M00878	24726	○
140	160	12	13	10	6	H	80 NBR M00878	24728	○
140	165	15	16	12,5	6,5	H	80 NBR M00878	24729	○
150	180	18	19	15	7,5	W	80 NBR M00878	4484	○
160	185	15	16	12,5	6,5	H	80 NBR M00878	4496	○
170	200	18	19	15	7,5	H	80 NBR M00878	3624	○
180	205	15	16	12,5	6,5	H	80 NBR M00878	4503	○
200	225	15	16	12,5	6,5	H	80 NBR M00878	4506	○
220	245	15	16	12,5	6,5	H	80 NBR M00878	4515	○
220	250	18	19	15	7,5	H	80 NBR M00878	4516	○
360	400	23	24	20	11	H	80 NBR M00878	4560	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring T 20

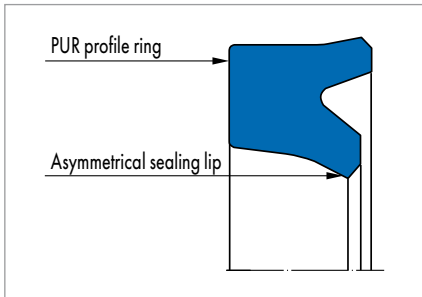


Fig. 1 Merkel U-Ring T 20

Product description

Merkel U-ring with asymmetrical profile, inner lip set back and press fit at the outside diameter.

Product advantages

Single-acting rod seal for standardised housings, amongst others, according to ISO 5597; very suitable as a secondary seal within a sealing system

- Good media resistance
- Wide operating temperature range
- Very good static and dynamic tightness
- Low breakaway force (in comparison to compact seals or U-rings with secondary sealing edge in corresponding material)
- Dynamic deformation value.

Application

Earth moving equipment, agricultural machinery, injection moulding machines, support cylinders, cranes, loading platforms, fork-lift trucks, standard cylinders.

Material

Ø range <500 mm

Material	Code	Hardness	Colour
Polyurethane	95 AU V142	95 Shore A	Blue

Ø range >500 mm

Material	Code	Hardness	Colour
Polyurethane	93 AU V167	93 Shore A	Red

Operating conditions

Material	95 AU V142/93 AU V167
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Pressure p in MPa	40
Running speed v in m/s	0,5*

* If a Merkel U-Ring T 20 is used as a secondary seal, higher running speeds may be permitted

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal → Technical Manual.

Profile	Max. permissible gap dimension			
	16 MPa	26 MPa	32 MPa	40 MPa
<5,0	0,45	0,4	0,35	–
>5,0 ... 7,5	0,50	0,45	0,4	0,35
>7,5 ... 12,5	0,55	0,5	0,45	0,4
15,0	0,60	0,55	0,45	0,4
>15 ... 20	0,62	0,57	0,47	0,42
>20 ... 25	0,65	0,57	0,47	0,42

The dimensions D1 and DF are to be viewed in connection with the guide elements used.

Tolerance recommendation and dimension D2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

For non-metallic guide profile $\leq 7,5$

16 MPa			26 MPa			32 MPa			40 MPa		
Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D
8 ... 200	f8	H11	8 ... 200	f8	H11	8 ... 110	f8	H11	8 ... 110	f8	H11
						>110 ... 200	f7	H11	>110 ... 200	f7	H11

For non-metallic guide profile $\geq 7,5 < 12,5$

16 MPa			26 MPa			32 MPa			40 MPa		
Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D
≤ 380	f8	H10	≤ 220	f8	H10	≤ 170	f8	H10	≤ 180	f8	H10
>380 ... 590	f7	H10	>220 ... 900	f7	H10	>180 ... 950	f7	H10			

For non-metallic guide profile $\geq 12,5 < 15$

16 MPa			26 MPa			32 MPa			40 MPa		
Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D
≤ 1000	f8	H10	≤ 310	f8	H10	≤ 1000	f8	H10	≤ 1200	f7	H10
			>310 ... 1000	f7	H10						

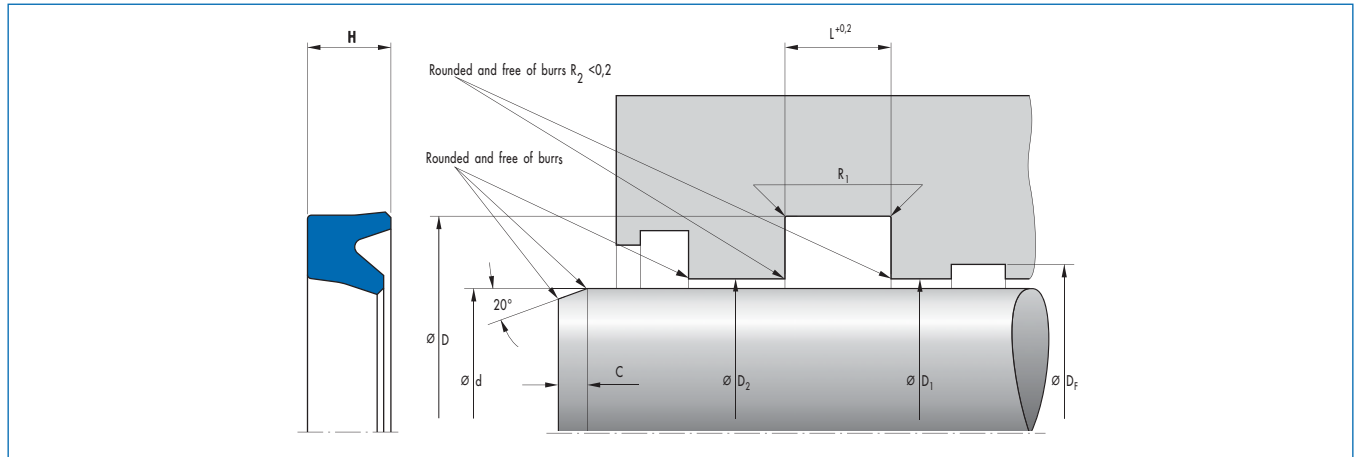
For non-metallic guide profile $\geq 15 < 25$

16 MPa			26 MPa			32 MPa			40 MPa		
Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D	Nominal $\varnothing d$	d	D
≤ 1200	f8	H10	≤ 400	f8	H10	≤ 1200	f7	H10	≤ 1200	f7	H10
			>400 ... 1200	f7	H10						

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



d	D	H	L	Profile	C	R ₁	Fitting	Housing	Material	Article No.	
8	16	5,7	6,3	4	4	0,4	W	ISO	95 AU V142	24223246	●
8	16	8,2	9	4	4	0,4	W		95 AU V142	24223247	○
10	18	5,7	6,3	4	4	0,4	W	ISO	95 AU V142	24223248	●
10	20	7,3	8	5	4	0,4	W	ISO	95 AU V142	24223249	●
10	20	8,2	9	5	4	0,4	H		95 AU V142	24223253	○
11	19	5,7	6,3	4	4	0,4	S		95 AU V142	24354784	○
12	20	5,7	6,3	4	4	0,4	W	ISO	95 AU V142	24223254	●
12	22	7,3	8	5	4,5	0,4	W	ISO	95 AU V142	24223255	●
12	22	8,2	9	5	4,5	0,4			95 AU V142	24187190	○
14	22	5,7	6,3	4	4	0,4		ISO	95 AU V142	24268060	●
14	24	7,3	8	5	4,5	0,4	H	ISO	95 AU V142	24223256	●
14	24	8,2	9	5	4,5	0,4	W		95 AU V142	24223257	○
15	25	8,2	9	5	4,5	0,4	H		95 AU V142	24223258	●
16	24	5,7	6,3	4	4	0,4	W	ISO	95 AU V142	24223260	●
16	26	7,3	8	5	4	0,4	W	ISO	95 AU V142	24223261	○
16	26	8,2	9	5	4	0,4			95 AU V142	24223262	○
18	26	5,7	6,3	4	4	0,4		ISO	95 AU V142	24268070	●
18	26	8,2	9	4	4	0,4	W		95 AU V142	24223263	○
18	28	7,3	8	5	4	0,4	W	ISO	95 AU V142	24223264	●
18	28	8,2	9	5	4,5	0,4			95 AU V142	24187191	●
20	28	5,7	6,3	4	4	0,4	W	ISO	95 AU V142	24223265	●
20	30	7,3	8	5	4,5	0,4	W	ISO	95 AU V142	24223266	●
20	30	8,2	9	5	4,5	0,4			95 AU V142	24187192	●
22	30	5,7	6,3	4	4	0,4		ISO	95 AU V142	24236862	●
22	30	7,3	8	4	4	0,4	W		95 AU V142	24249568	○
22	30	8,2	9	4	4	0,4	H		95 AU V142	24223267	●
22	32	7,3	8	5	4,5	0,4	H	ISO	95 AU V142	24223268	●
22	32	8,2	9	5	4,5	0,4			95 AU V142	24187193	○
22	35	9,1	10	6,5	5	0,4	H		95 AU V142	24369456	○
25	33	5,7	6,3	4	4	0,4	W	ISO	95 AU V142	24223269	●
25	33	8,2	9	4	4	0,4	W		95 AU V142	24308334	○
25	35	6,4	7	5	4,5	0,4			95 AU V142	24360709	○
25	35	7,3	8	5	4,5	0,4		ISO	95 AU V142	24223070	●
25	35	8,2	9	5	4,5	0,4	W		95 AU V142	24223271	●
25	38	8,6	9,5	6,5	5	0,4			95 AU V142	24362136	○

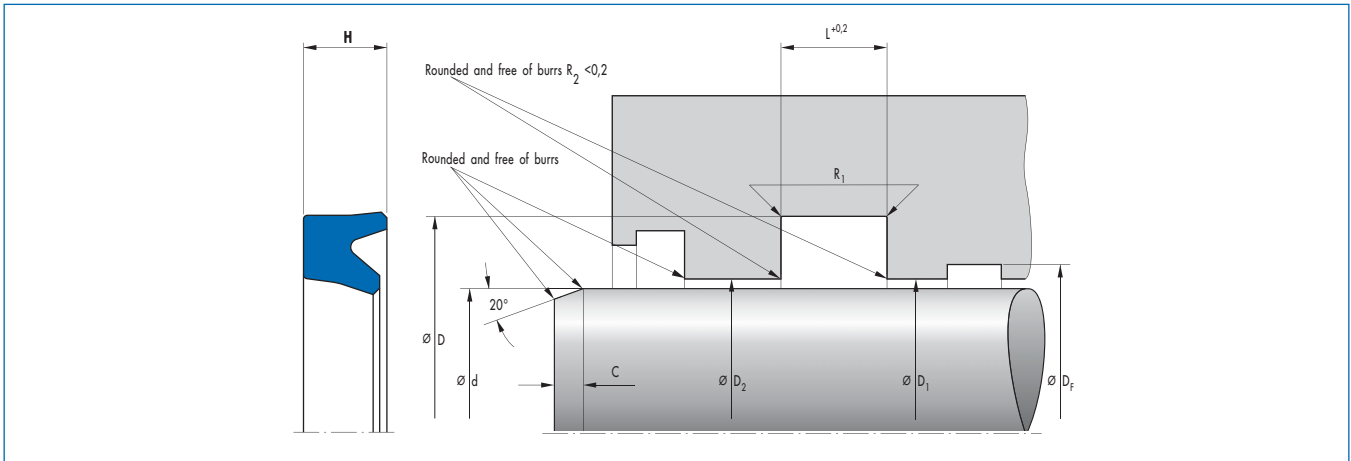
● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

d	D	H	L	Profile	C	R ₁	Fitting	Housing	Material	Article No.	
25	40	10	11	7,5	5,5	0,4	H		95 AU V142	24223272	●
25,4	34,56	5,9	6,5	4,6	4,5	0,4			95 AU V142	24370951	○
26	36	10	11	5	4,5	0,4	H		95 AU V142	24372447	○
27	36	6,8	7,5	4,5	4,5	0,4	W		95 AU V142	24268341	○
28	36	5,7	6,3	4	4	0,4	W	ISO	95 AU V142	24237159	●
28	36	8,2	9	4	4	0,4	W		95 AU V142	24249569	○
28	36	10	11	4	4	0,4	W		95 AU V142	24223273	○
28	38	7,3	8	5	4,5	0,4	H	ISO	95 AU V142	24223274	●
28	38	8,2	9	5	4,5	0,4			95 AU V142	24187195	●
28	40	10	11	6	5	0,4	W		95 AU V142	24223275	●
28	43	11,4	12,5	7,5	5,5	0,4	H	ISO	95 AU V142	24261406	●
29	37	5,7	6,3	4	4	0,4	W		95 AU V142	24368792	○
30	38	5,7	6,3	4	4	0,4	W		95 AU V142	24236861	●
30	38	8,2	9	4	4	0,4	W		95 AU V142	24223276	●
30	40	10	11	5	4,5	0,4	W		95 AU V142	24187196	●
30	42	8,7	9,6	6	5	0,4	W		95 AU V142	24373870	○
30	45	10	11	7,5	5,5	0,4	W		95 AU V142	24223277	●
32	40	5,7	6,3	4	4	0,4	W		95 AU V142	24234472	●
32	40	8,2	9	4	4	0,4	W		95 AU V142	24258895	●
32	42	7,3	8	5	4,5	0,4	W	ISO	95 AU V142	24223278	●
32	42	8,2	9	5	4,5	0,4	W		95 AU V142	24249570	○
32	42	10	11	5	4,5	0,4	W		95 AU V142	24223279	●
32	44	8,2	9	6	5	0,4	H		95 AU V142	24369393	○
32	47	10	11	7,5	5,5	0,4			95 AU V142	24187197	●
34	44	6,4	7	5	4,5	0,4	W		95 AU V142	24368632	○
35	43	5,7	6,3	4	4	0,4	W		95 AU V142	24236860	●
35	43	6,8	7,5	4	4,5	0,4	W		95 AU V142	24360144	○
35	45	10	11	5	4,5	0,4	W		95 AU V142	24187198	●
35	50	10	11	7,5	5,5	0,4			95 AU V142	24187199	●
35	52	11,8	13	8,5	5,5	0,4	W		95 AU V142	24374124	○
36	44	5,7	6,3	4	4,5	0,4	W	ISO	95 AU V142	24266873	●
36	44	8,2	9	4	4,5	0,4	W		95 AU V142	24355159	●
36	46	7,3	8	5	4,5	0,4	W	ISO	95 AU V142	24223280	●
36	46	10	11	5	4,5	0,4	W		95 AU V142	24187200	●
36	48	7,3	8	6	5	0,4	W		95 AU V142	24314092	○
36	48	10	11	6	5	0,4	W		95 AU V142	24267642	●
36	50	10	11	7	5	0,4	S		95 AU V142	24345948	○
36	51	10	11	7,5	5,5	0,4			95 AU V142	24358522	○
36	51	11,4	12,5	7,5	5,5	0,4		ISO	95 AU V142	24269445	●
36	52	13	14,3	8	5,5	0,4			95 AU V142	24375441	○
37	47	10	11	5	4,5	0,4	W		95 AU V142	24369267	○
40	48	5,7	6,3	4	4	0,4	H		95 AU V142	24239428	●
40	48	8,2	9	4	4	0,4	H		95 AU V142	24223281	●
40	50	7,3	8	5	4,5	0,4	W	ISO	95 AU V142	24223283	●
40	50	8,2	9	5	4,5	0,4	W		95 AU V142	24223282	●
40	50	10	11	5	4,5	0,4	W		95 AU V142	24187702	●
40	55	10	11	7,5	5,5	0,4			95 AU V142	24187203	●
40	55	11,4	12,5	7,5	5,5	0,4		ISO	95 AU V142	24261407	●
40	58	11,4	12,5	9	5,5	0,4			95 AU V142	24360465	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing



d	D	H	L	Profile	C	R ₁	Fitting	Housing	Material	Article No.	
42	50	5,7	6,3	4	4	0,4	H		95 AU V142	24261932	●
42	52	10	11	5	4,5	0,4	W		95 AU V142	24223284	●
44	52	5,7	6,3	4	4,5	0,4	H		95 AU V142	24292881	○
44,5	54	6,5	7,1	4,8	4,5	0,4	W		95 AU V142	24333357	○
45	53	8	9	4	4,5	0,4	H		95 AU V142	24290032	○
45	53	8,2	9	4	4	0,4	H		95 AU V142	24223285	●
45	55	7,3	8	5	4,5	0,4	W	ISO	95 AU V142	24223286	●
45	55	10	11	5	4,5	0,4	W		95 AU V142	24223287	●
45	57	8,7	9,6	6	5	0,4	W		95 AU V142	24373871	○
45	60	10	11	7,5	5,5	0,4	W		95 AU V142	24187204	●
46	56	7,3	8	5	4,5	0,4	W		95 AU V142	24375268	○
47	59	9,6	10,5	6	5	0,4	W		95 AU V142	24360464	○
48	56	8,2	9	4	4,5	0,4	H		95 AU V142	24233879	○
50	58	8	9	4	4,5	0,4	H		95 AU V142	24290848	○
50	58	8,2	9	4	4	0,4	H		95 AU V142	24223250	●
50	60	7,3	8	5	4,5	0,4	H	ISO	95 AU V142	24223251	●
50	60	10	11	5	4,5	0,4	H		95 AU V142	24187205	●
50	62	10	11	6	5	0,4	W		95 AU V142	24223289	●
50	65	10	11	7,5	5,5	0,4	W		95 AU V142	24187206	●
50	65	11,4	12,5	7,5	5,5	0,4	W	ISO	95 AU V142	24223290	●
50	70	11,4	13	10	6	0,6	H		95 AU V142	24223291	●
50,8	60,3	6,5	7,1	4,8	4,5	0,4	H		95 AU V142	24333369	○
50,8	66,6	12,7	13,4	7,9	5	0,4	W		95 AU V142	24296042	○
50,8	69,85	11,8	13,5	9,5	6	0,4			95 AU V142	24333466	○
51	61,4	6,4	7	5,2	4,5	0,4	W		95 AU V142	24362578	●
52	62	6,4	7	5	4,5	0,4	H		95 AU V142	24374053	○
53	63	9	10	5	4,5	0,4	H		95 AU V142	24371047	○
55	63	7,3	8	4	4,5	0,4	H		95 AU V142	24236859	●
55	63	8	9	4	4,5	0,4	H		95 AU V142	24290846	○
55	63	8,2	9	4	4,5	0,4	H		95 AU V142	24223292	●
55	65	7,3	8	5	4,5	0,4	H		95 AU V142	24239429	●
55	65	10	11	5	4,5	0,4	H		95 AU V142	24187207	●
55	65	11,8	13	5	4,5	0,4	H		95 AU V142	24187208	●
55	67	8,7	9,6	6	5	0,4	W		95 AU V142	24374139	○
55	67	10	11	6	5	0,4	W		95 AU V142	24261225	○
55	70	10	11	7,5	5,5	0,4	W		95 AU V142	24238292	●

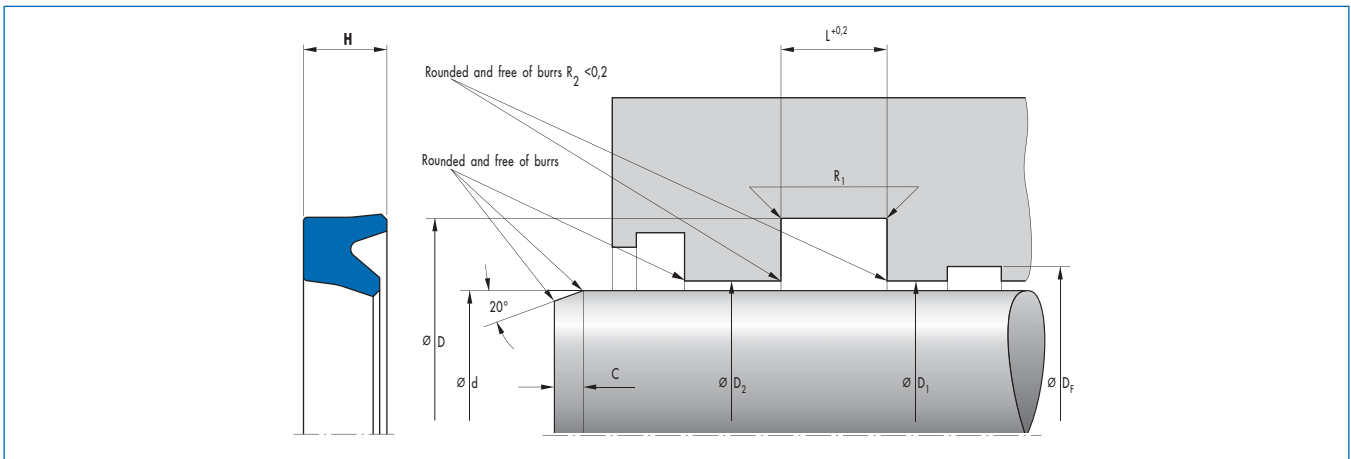
● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

d	D	H	L	Profile	C	R ₁	Fitting	Housing	Material	Article No.	
55	70	11,4	13	7,5	5,5	0,4	W		95 AU V142	24187209	●
56	66	7,3	8	5	4,5	0,4	H		95 AU V142	24266874	●
56	66	8,2	9	5	4,5	0,4	H		95 AU V142	24223293	●
56	66	10	11	5	4,5	0,4	H		95 AU V142	24236884	●
56	68	10	11	6	5	0,4	W		95 AU V142	24367432	○
56	71	11,4	12,5	7,5	5,5	0,4	W	ISO	95 AU V142	24223294	●
56	71	11,4	13	7,5	5,5	0,4	W		95 AU V142	24223295	○
60	68	8	9	4	4,5	0,4	H		95 AU V142	24219456	●
60	70	7,3	8	5	4,5	0,4	H		95 AU V142	24236858	●
60	70	10	11	5	4,5	0,4	H		95 AU V142	24223296	●
60	70	11,8	13	5	4,5	0,4	W		95 AU V142	24187211	●
60	72	10	11	6	5	0,4	H		95 AU V142	24261224	○
60	75	10,4	11	7,5	5,5	0,4	W		95 AU V142	24337823	○
60	75	11,4	12,5	7,5	5,5	0,4	W		95 AU V142	24223297	●
60	75	11,4	13	7,5	5,5	0,4	W		95 AU V142	24187212	●
60	80	16,6	18,2	10	6	0,6	W		95 AU V142	24373695	○
63	73	11,8	13	5	4,5	0,4	H		95 AU V142	24223298	●
63	75	8,7	9,6	6	5	0,4	H		95 AU V142	24246801	●
63	78	10	11	7,5	5,5	0,4	W		95 AU V142	24236586	○
63	78	11,4	12,5	7,5	5,5	0,4	W	ISO	95 AU V142	24223299	●
63	80	12,7	14	8,5	5,5	0,4	W		95 AU V142	24370282	○
63	83	14,6	16	10	6	0,6		ISO	95 AU V142	24289375	○
65	73	8,2	9	5	4,5	0,4	H		95 AU V142	49000807	○
65	75	7,3	8	5	4,5	0,4	H		95 AU V142	24370874	○
65	75	11,8	13	5	4,5	0,4	H		95 AU V142	24187213	●
65	77	8,7	9,6	6	5	0,4	H		95 AU V142	24251887	●
65	80	10	11	7,5	5,5	0,4	W		95 AU V142	24373620	○
65	80	11,4	13	7,5	5,5	0,4	W		95 AU V142	24223300	●
65	85	11,4	13	10	6	0,6			95 AU V142	24223301	○
70	78	8,2	9	4	4,5	0,4	H		95 AU V142	24314731	●
70	79,6	7,9	8,7	4,8	4,5	0,4	H		95 AU V142	24373899	○
70	80	11,8	13	5	4,5	0,4	H		95 AU V142	24187214	●
70	82	8,7	9,6	6	5	0,4	H		95 AU V142	24236857	●
70	85	10	11	7,5	5,5	0,4	W		95 AU V142	24233880	●
70	85	11,4	12,5	7,5	5,5	0,4	W	ISO	95 AU V142	24212669	●
70	85	11,4	13	7,5	5,5	0,4	W		95 AU V142	24223302	●
70	86	14	15,5	8	5,5	0,6	W		95 AU V142	24363001	○
70	90	11,4	13	10	6	0,6	W		95 AU V142	24223304	●
70	90	14,6	16	10	6	0,6	W	ISO	95 AU V142	24223303	○
72	84	8,7	9,6	6	5	0,4	H		95 AU V142	24362391	○
72	92	14,6	16	10	6	0,6	W		95 AU V142	24358384	○
73	85	8,7	9,6	6	5	0,4	H		95 AU V142	24374940	○
73	85	11,4	12,5	6	5	0,4	H		95 AU V142	24363261	○
75	85	12	12,5	5	4,5	0,4	H		95 AU V142	24227939	●
75	87	8,7	9,6	6	5	0,4	H		95 AU V142	24266875	●
75	88	10	11	6,5	5	0,4	H		95 AU V142	24374792	○
75	90	9	9,9	7,5	5,5	0,4	H		95 AU V142	24374761	○
75	90	10	11	7,5	5,5	0,4	W		95 AU V142	24223305	●
75	95	14,6	16	10	6	0,6	W		95 AU V142	24370708	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing



d	D	H	L	Profile	C	R ₁	Fitting	Housing	Material	Article No.	
80	90	7,3	8	5	4,5	0,4	H		95 AU V142	24363199	○
80	90	10	11	5	4,5	0,4	H		95 AU V142	24187219	○
80	90	11,8	13	5	4,5	0,4	H		95 AU V142	24223306	●
80	92	8,7	9,6	6	5	0,4	H		95 AU V142	24241622	●
80	95	9	9,9	7,5	5,5	0,4	H		95 AU V142	24374809	○
80	95	10	11	7,5	5,5	0,4	H		95 AU V142	24373621	○
80	95	11,4	12,5	7,5	5,5	0,4	H	ISO	95 AU V142	24223307	●
80	95	11,4	13	7,5	5,5	0,4	H		95 AU V142	24187220	●
80	100	11,4	13	10	6	0,6	W		95 AU V142	24223308	●
80	100	14,6	16	10	6	0,6	W	ISO	95 AU V142	24223309	●
82,55	101,6	15,2	16,7	9,5	6	0,6	W		95 AU V142	24296094	○
85	95	11,8	12,5	5	4,5	0,4	H		95 AU V142	24213882	●
85	97	8,7	9,6	6	5	0,4	H		95 AU V142	24266876	●
85	100	9	9,9	7,5	5,5	0,4	H		95 AU V142	24374873	○
85	100	10	11	7,5	5,5	0,4	H		95 AU V142	24374762	○
85	100	11,4	12,5	7,5	5,5	0,4	H		95 AU V142	24223310	●
85	100	11,4	13	7,5	5,5	0,4	H		95 AU V142	24194923	●
88	105	12,7	14	8,5	5,5	0,6	H		95 AU V142	24360733	○
88,9	107,95	14,4	15,9	9,5	6	0,6	W		95 AU V142	24362624	○
90	98	5,7	6,3	4	4,5	0,4	H		95 AU V142	24293541	○
90	98	8,2	9	4	4,5	0,4	H		95 AU V142	24359373	○
90	99,6	7,6	8,4	4,8	4,5	0,4	H		95 AU V142	24375705	○
90	100	6,8	7,5	5	4,5	0,4	H	ISO	95 AU V142	24368410	○
90	100	10	11	5	4,5	0,4	H		95 AU V142	24209770	○
90	102	8,7	9,6	6	5	0,4	H		95 AU V142	24251888	●
90	105	10	11	7,5	5,5	0,4	H		95 AU V142	24235803	●
90	105	11,4	12,5	7,5	5,5	0,4	H	ISO	95 AU V142	24223311	●
90	105	11,4	13	7,5	5,5	0,4	H		95 AU V142	24223312	●
90	110	11,4	13	10	6	0,6	W		95 AU V142	24223313	●
90	110	14,6	16	10	6	0,6	W	ISO	95 AU V142	24289376	●
95	110	9	9,9	7,5	5,5	0,4	H		95 AU V142	24374785	○
95	110	10	11	7,5	5,5	0,4	H		95 AU V142	24374810	○
95	110	11,8	13	7,5	5,5	0,4	H		95 AU V142	24369674	○
95	115	11,4	13	10	6	0,6	W		95 AU V142	24265228	○
95	115	12	13,2	10	6	0,6	W		95 AU V142	24374811	○
95,3	114,3	12,3	13,5	9,5	6	0,6	H		95 AU V142	24315959	○

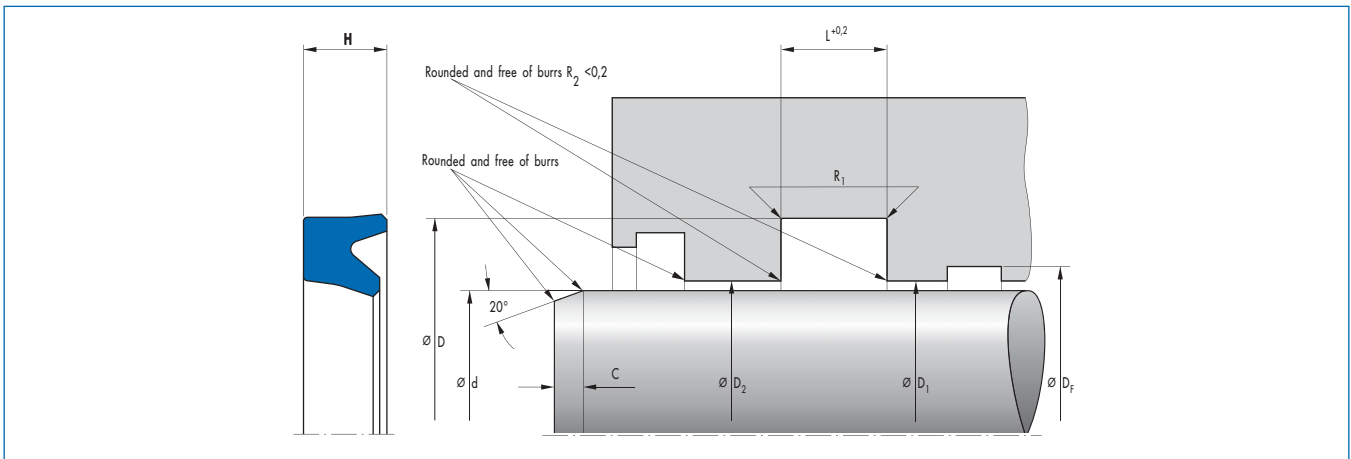
● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

d	D	H	L	Profile	C	R ₁	Fitting	Housing	Material	Article No.	
95,3	114,3	15,2	16,7	9,5	6	0,6	H		95 AU V142	24315958	○
100	115	9	9,9	7,5	5,5	0,4	H		95 AU V142	24374763	○
100	115	10	11	7,5	5,5	0,4	H		95 AU V142	24235802	●
100	115	10,9	12	7,5	5,5	0,4	H		95 AU V142	24266877	●
100	115	11,4	13	7,5	5,5	0,4	H		95 AU V142	24223314	●
100	120	11,4	13	10	6	0,6	W		95 AU V142	24223316	●
100	120	12	13,2	10	6	0,6	W		95 AU V142	24374793	○
100	120	14,6	16	10	6	0,6	H	ISO	95 AU V142	24187222	●
102	117	10,9	12	7,5	5,5	0,4	H		95 AU V142	24360191	○
105	115	10	11	5	4,5	0,4	H		95 AU V142	24366780	○
105	115	12	13	5	4,5	0,4	H		95 AU V142	24213883	○
105	120	11,4	12,5	7,5	5,5	0,4	H		95 AU V142	24300392	●
105	125	14,6	16	10	6	0,6	H		95 AU V142	24223317	●
108	127	12,3	13,5	9,5	6	0,6	H		95 AU V142	24315960	○
110	120	7,7	8,5	5	4,5	0,4	H		95 AU V142	24369546	○
110	125	9	9,9	7,5	5,5	0,4	H		95 AU V142	24374786	○
110	125	9,6	10,6	7,5	5,5	0,4	H	ISO	95 AU V142	24368411	○
110	125	10,9	12	7,5	5,5	0,4	H		95 AU V142	24239427	●
110	125	12	13	7,5	5,5	0,4	H		95 AU V142	24242341	●
110	130	11,8	13	10	6	0,6	H		95 AU V142	24376016	○
110	130	14,6	16	10	6	0,6	W	ISO	95 AU V142	24223318	●
114,3	133,35	15,2	16,7	9,5	6	0,6	H		95 AU V142	24296086	○
115	130	10,9	12	7,5	5,5	0,4	H		95 AU V142	24251889	○
115	135	14,6	16	10	6	0,6	W		95 AU V142	24223319	●
115	140	17,3	19	12,5	6,5	0,8	W		95 AU V142	24361949	○
120	135	10,9	12	7,5	5,5	0,4	H		95 AU V142	24360190	○
120	140	14,6	16	10	6	0,6	H		95 AU V142	24223320	●
120	145	17,3	19	12,5	6,5	0,8	W		95 AU V142	24371176	○
125	140	10,9	12	7,5	5,5	0,4	H		95 AU V142	24251890	●
125	145	14,6	16	10	6	0,6	H	ISO	95 AU V142	24223321	●
125	155	17,3	19	15	7,5	0,8	W		95 AU V142	24371643	○
130	140	15	16	5	5,5	0,4	H		95 AU V142	24213884	○
130	145	10	11	7,5	5,5	0,4	H		95 AU V142	24359621	●
130	145	13,7	15	7,5	5,5	0,4	H		95 AU V142	24362610	○
130	145	14,6	16	7,5	5,5	0,4	H		95 AU V142	24358619	○
130	150	14,6	16	10	6	0,6	H		95 AU V142	24223322	●
130	160	17,3	19	15	7,5	0,4	W		95 AU V142	24370486	○
133,4	152,4	12,3	13,5	9,5	6	0,6	H		95 AU V142	24315961	○
135	155	14,6	16	10	6	0,6			95 AU V142	24360106	○
135	165	17,3	19	15	7,5	0,8	W		95 AU V142	24362625	○
140	155	11,4	12,5	7,5	5,5	0,8			95 AU V142	24357236	○
140	160	11,8	13	10	6	0,6			95 AU V142	24376017	○
140	160	14,6	16	10	6	0,6	H	ISO	95 AU V142	24223323	●
140	170	17,3	19	15	7,5	0,8	W		95 AU V142	24377812	○
145	165	14,6	16	10	6	0,6	H		95 AU V142	24375686	○
150	170	11,8	13	10	6	0,6	H		95 AU V142	24295710	○
150	170	14,6	16	10	6	0,6	H		95 AU V142	24223324	●
150	180	17,3	19	15	7,5	0,8	W		95 AU V142	24223325	○
158,8	177,8	12,3	13,5	9,5	6	0,6	H		95 AU V142	24315962	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing



d	D	H	L	Profile	C	R ₁	Fitting	Housing	Material	Article No.	
160	175	14,6	16	7,5	5,5	0,4	H		95 AU V142	24374166	○
160	180	14,6	16	10	6	0,6	H		95 AU V142	24266878	●
160	180	17,3	19	10	6	0,6	H		95 AU V142	24362611	○
160	185	14,6	16	12,5	6,5	0,8	H	ISO	95 AU V142	24223326	●
160	190	17,3	19	10	6	0,06	H		95 AU V142	530551	○
165	180	14,6	16	7,5	5,5	0,4	H		95 AU V142	24363184	○
170	190	14,6	16	10	6	0,6	H		95 AU V142	24338964	●
180	200	11,8	13	10	6	0,6	H		95 AU V142	24374656	○
180	200	14,6	16	10	6	0,6	H		95 AU V142	24223327	●
180	205	14,6	16	12,5	6,5	0,8	H	ISO	95 AU V142	24223328	●
180	205	18,2	20	12,5	6,5	0,8	H		95 AU V142	24380944	○
180	210	17,3	19	15	7,5	0,8	W		95 AU V142	24375978	○
180	210	22,8	25	15	7,5	0,8	W	ISO	95 AU V142	24359904	○
185	200	11,4	12,5	7,5	5,5	0,4	H		95 AU V142	24373150	○
190	210	13,7	15	10	6	0,6	H		95 AU V142	24368634	○
190	210	14,6	16	10	6	0,6	H		95 AU V142	24328527	●
190	215	17,1	18,8	12,5	6,5	0,8	H		95 AU V142	24370226	○
200	215	11,4	12,5	7,5	5,5	0,4	H		95 AU V142	24339703	○
200	220	14,6	16	10	6	0,6	H		95 AU V142	24223329	●
200	225	14,6	16	12,5	6,5	0,8	H	ISO	95 AU V142	24223330	●
200	225	18,2	20	12,5	6,5	0,8	H		95 AU V142	24380945	○
205	235	21,8	24	15	7,5	0,8	W		95 AU V142	24361564	○
210	230	14,6	16	10	6	0,6	H		95 AU V142	24337781	○
215	235	14,6	16	10	6	0,6	H		95 AU V142	24356092	○
215	235	14,6	16	10	6	0,6	H		95 AU V142	49030353	●
215	240	18,2	20	12,5	6,5	0,8	H		95 AU V142	24372392	○
215	245	20,9	23	15	7,5	0,8	H		95 AU V142	24362845	○
220	240	14,6	16	10	6	0,6	H		95 AU V142	24223331	●
220	250	17,3	19	15	7,5	0,8	H		95 AU V142	24223332	●
220	250	18,2	20	15	7,5	0,8	H	ISO	95 AU V142	24375979	○
220	250	21,8	24	15	7,5	0,8	H		95 AU V142	24367393	○
220	250	22,8	25	15	7,5	0,8	H		95 AU V142	24380946	○
225	245	14,6	16	10	6	0,6	H		95 AU V142	24376131	○
230	250	14,6	16	10	6	0,6	H		95 AU V142	24223336	○
235	255	14,6	16	10	6	0,6	H		95 AU V142	24366784	○
240	260	14,6	16	10	6	0,6	H		95 AU V142	24290247	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

d	D	H	L	Profile	C	R ₁	Fitting	Housing	Material	Article No.	
240	270	17,3	19	15	7,5	0,8	H		95 AU V142	24352222	○
240	270	18	7,1	15	7,5	0,8	H		95 AU V142	24314612	○
245	267	14,1	15,5	11	6,5	0,6	H		95 AU V142	24362532	○
250	270	14,6	16	10	6	0,6	H		95 AU V142	24291160	●
250	280	17,3	19	15	7,5	0,8	H		95 AU V142	24223333	●
250	280	20,9	23	15	7,5	0,8	H		95 AU V142	24373997	○
254	274,6	14,6	16	10,3	6,5	0,6	H		95 AU V142	24359559	○
260	280	14,6	16	10	6	0,6	H		95 AU V142	24339213	●
270	290	14,6	16	10	6	0,6	H		95 AU V142	24331910	○
270	300	17,3	19	15	7,5	0,8	H		95 AU V142	24361563	○
270	300	22,5	24	15	7,5	0,8	H		95 AU V142	24360583	○
275	305	17,3	19	15	7,5	0,8	H		95 AU V142	24327509	○
280	300	15	16,5	10	6	0,6	H		95 AU V142	24359724	○
280	310	17,3	19	15	7,5	0,8	H		95 AU V142	24223334	●
290	320	17,3	19	15	7,5	0,8	H		95 AU V142	24356384	○
300	330	17,3	19	15	7,5	0,8	H		95 AU V142	24351902	●
300	330	21,5	23,6	15	7,5	0,8	H		95 AU V142	24377304	○
300	330	21,8	24	15	7,5	0,8	H		95 AU V142	24361028	○
304,8	330,2	18,1	19,8	12,7	7,5	0,8	H		95 AU V142	24366949	○
306	331	20	22	12,5	6,5	0,8	H		95 AU V142	24361684	○
310	340	17,3	19	15	7,5	0,8	H		95 AU V142	24358215	○
320	350	17,3	19	15	7,5	0,8	H		95 AU V142	24335042	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring T 22

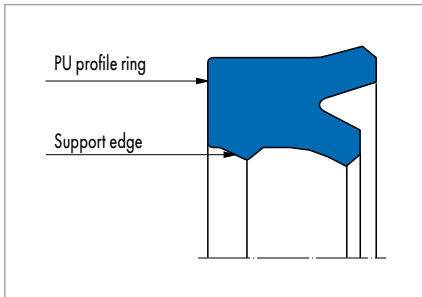


Fig. 1 Merkel U-Ring T 22

Product description

Merkel polyurethane U-ring with asymmetrical profile, shortened inner lip and second support edge and sealing edge as well as press fit at the outside diameter.

Product advantages

Single-acting rod seal, also for standardised housings according to ISO 5597

- Highly wear-resistant
- Good media resistance
- Wide operating temperature range
- Very good static and dynamic tightness
- (Note: low deformation value, therefore not suitable for sealing systems).

Application

Earth moving equipment, support cylinders, marine hydraulics, mobile hydraulics. We recommend more modern series for new designs.

Material

Material	Code	Hardness
Novathan (polyurethane)	95 AU V142	95 Shore A

Operating conditions

Material	95 AU V142
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile		Max. permissible gap dimension			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
8 ... 13	5,0	0,50	0,40	0,35	–
11 ... 13	7,5	0,55	0,45	0,40	0,35
11 ... 16	10,0	0,60	0,50	0,45	0,40
≥16	12,5	0,60	0,50	0,45	0,40

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

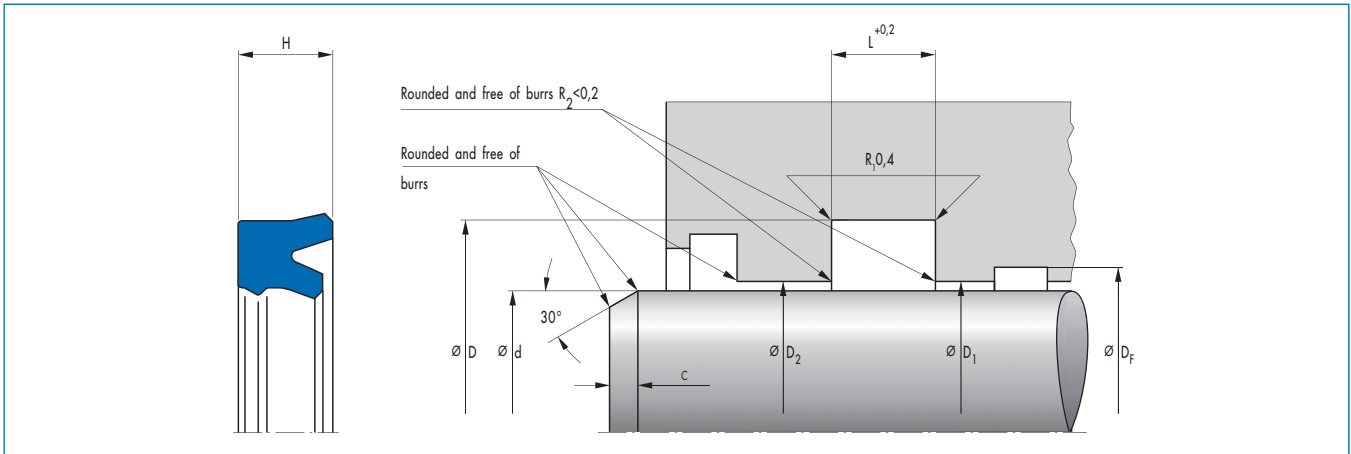
Nominal Ø d	d	D
15 ... 160	f8	H10

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
15	25	8,2	9	5	2,5			95 AU V142	24249943	○
20	30	7,3	8	5	2,5	H	ISO	95 AU V142	24250814	●
20	30	8,2	9	5	2,5	H		95 AU V142	24250815	○
22	32	7,3	8	5	2,5	W	ISO	95 AU V142	24250816	○
22	32	8,2	9	5	2,5	H		95 AU V142	24250817	○
25	35	7,3	8	5	2,5	H	ISO	95 AU V142	24250818	●
25	35	8,2	9	5	2,5	W		95 AU V142	24250819	○
28	38	7,3	8	5	2,5	H	ISO	95 AU V142	24250820	○
28	38	8,2	9	5	2,5	W		95 AU V142	24250821	○
30	40	7,3	8	5	2,5	W		95 AU V142	24289914	●
30	40	10	11	5	2,5	W		95 AU V142	24250822	●
30	45	10	11	7,5	4	W		95 AU V142	24250823	○
32	42	7,3	8	5	2,5	W	ISO	95 AU V142	24250824	●
32	42	10	11	5	2,5	W		95 AU V142	24250825	●
32	47	10	11	7,5	4	H		95 AU V142	24250826	○
35	45	10	11	5	2,5	W		95 AU V142	24250827	●
35	50	10	11	7,5	4	H		95 AU V142	24250828	●
36	46	10	11	5	2,5	W		95 AU V142	24250829	●
40	50	7,3	8	5	2,5	W	ISO	95 AU V142	24250830	●
40	50	8,2	9	5	2,5	W		95 AU V142	24250831	○
40	50	10	11	5	2,5	W		95 AU V142	24250832	●
40	55	10	11	7,5	4	H		95 AU V142	24250833	●
45	55	10	11	5	2,5	W		95 AU V142	24250834	●
45	60	10	11	7,5	4			95 AU V142	24250835	●
50	60	7,3	8	5	2,5	H	ISO	95 AU V142	24250836	●
50	60	10	11	5	2,5	H		95 AU V142	24250837	●
50	65	10	11	7,5	4	W		95 AU V142	24245251	●
50	70	11,4	12,5	10	5			95 AU V142	24289912	○
50	70	11,4	13	10	5	W		95 AU V142	24291788	○
55	65	10	11	5	2,5	H		95 AU V142	24250839	●
55	65	11,4	13	5	2,5	H		95 AU V142	24250840	○
55	70	11,4	13	7,5	4	W		95 AU V142	24250841	●
56	71	11,4	12,5	7,5	4	W	ISO	95 AU V142	24250842	●
56	71	11,4	13	7,5	4	W		95 AU V142	24250843	○
60	70	10	11	5	2,5	H		95 AU V142	24250844	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
60	70	11,4	13	5	2,5	H		95 AU V142	24250845	○
60	75	11,4	12,5	7,5	4	W		95 AU V142	24250846	○
60	75	11,4	13	7,5	4	W		95 AU V142	24250847	●
63	83	11,4	12,5	10	5			95 AU V142	24289913	○
63	83	11,4	13	10	5	W		95 AU V142	24291789	○
65	75	11,4	13	5	2,5	H		95 AU V142	24250848	●
65	80	11,4	13	7,5	4	W		95 AU V142	24250849	○
65	85	11,4	13	10	5	W		95 AU V142	24250850	○
70	80	11,4	13	5	2,5	H		95 AU V142	24250851	●
70	90	11,4	13	10	5			95 AU V142	24250854	○
70	90	14,6	16	10	5			95 AU V142	24250855	●
75	85	11,4	12,5	5	2,5	H		95 AU V142	24265555	○
75	85	11,4	13	5	2,5	H		95 AU V142	24265557	○
75	90	10	11	7,5	4	W		95 AU V142	24250856	○
80	90	11,4	13	5	2,5	H		95 AU V142	24250857	○
80	95	11,4	12,5	7,5	4	H	ISO	95 AU V142	24250858	●
80	95	11,4	13	7,5	4	H		95 AU V142	24250859	○
80	100	11,4	13	10	5	W		95 AU V142	24250860	○
90	105	11,4	12,5	7,5	4	H		95 AU V142	24250861	●
90	105	11,4	13	7,5	4	H		95 AU V142	24250862	○
90	110	11,4	13	10	5	W		95 AU V142	24250863	○
100	115	11,4	13	7,5	4	H		95 AU V142	24250864	●
100	120	11,4	12,5	10	5	W		95 AU V142	24250865	●
100	120	11,4	13	10	5	W		95 AU V142	24250866	○
100	120	14,6	16	10	5	W		95 AU V142	24250867	○
110	130	14,6	16	10	5	W		95 AU V142	24250868	●
120	140	11,4	12,5	10	5	H		95 AU V142	24289915	○
120	140	14,6	16	10	5	H		95 AU V142	24250869	○
125	145	14,6	16	10	5	H		95 AU V142	24250870	●
140	160	14,6	16	10	5	H		95 AU V142	24250871	○
150	170	14,6	16	10	5	H		95 AU V142	24250872	●
160	185	14,6	16	12,5	6,5	H		95 AU V142	24250873	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring T 23

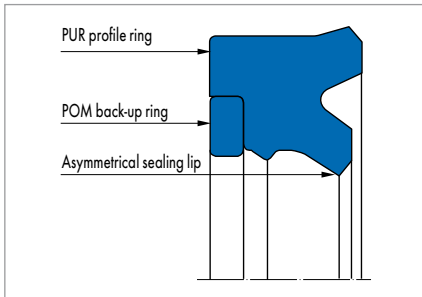


Fig. 1 Merkel U-ring T23

Product description

Two-piece Merkel seal set with shortened inner lip and active back-up ring with press fit at the outside diameter.

Product advantages

The Merkel U-Ring T 23 is mainly used with high pressures and is designed for housings according to ISO 5597

- Bridges large gaps even with high pressures
- Wide operating temperature range
- Very good static and dynamic tightness
- High resistance to wear.

Application

Earth moving equipment, steel hydraulics engineering, heavy-duty mobile hydraulics, marine hydraulics, support cylinders, scrap cutters.

Material

Material	Code	Hardness
Polyurethane	95 AU V142	95 Shore A
Material	Code	
Polyacetal	POM PO202	

Operating conditions

Material	95 AU V142/POM PO202
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Pressure p in MPa	50
Running speed v in m/s	0,1

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Tolerance recommendation and dimension D2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

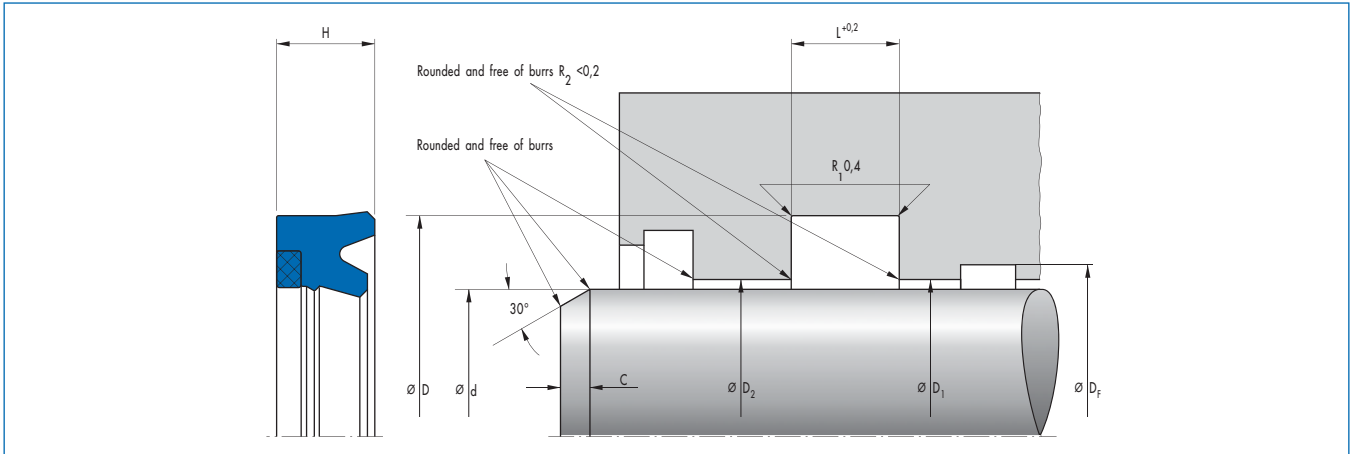
Dimensions D1 and DF must be considered in connection with the guide element used.

Nominal Ø D	Profile	16 MPa			26 MPa			32 MPa			40 MPa		
		D	d	X ₂	D	d	X ₂	D	d	X ₂	D	d	X ₂
... 180	7,5 ... 8,5 (BR 3,5)	H10	f8	0,8	H10	f8	0,7	H10	f8	0,50	H10	f8	0,4
>180 ... 310	7,5 ... 15,0 (BR 5,0)	H10	f8	1,2	H10	f8	1,0	H10	f8	0,65	H10	f8	0,5
>310 ... 400	12,5 ... 15,0 (BR 7,5)	H10	f8	1,8	H10	f8	1,4	H10	f8	0,90	H10	f8	0,7

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal. → Technical Manual. Dimensions listed in the table of dimensions with "h" can be fitted by hand into plunge-cut grooves. Articles identified with "w" can be easily fitted into plunge-cut grooves with a fitting tool. We will be pleased to supply a design drawing for this on enquiry.

Article list



d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
40	55	11,4	12,5	7,5	6	W	ISO	95 AU V142	24302155	○
50	65	11,4	12,5	7,5	6	W	ISO	95 AU V142	24302156	○
60	75	11,4	12,5	7,5	6	W		95 AU V142	24302157	●
70	85	11,4	12,5	7,5	6	W	ISO	95 AU V142	24295613	●
80	95	11,4	12,5	7,5	6	W	ISO	95 AU V142	24302158	●
80	100	14,6	16	10	7	W	ISO	95 AU V142	24332093	●
90	110	14,6	16	10	7	W	ISO	95 AU V142	24265875	●
100	115	14,6	16	7,5	6	W		95 AU V142	24377482	○
100	120	14,6	16	10	7	W	ISO	95 AU V142	24302127	●
110	125	14,6	16	7,5	6	W		95 AU V142	24377483	○
110	130	14,6	16	10	7	W	ISO	95 AU V142	24265876	●
120	135	14,6	16	7,5	6	W		95 AU V142	24344467	○
125	140	11,4	12,5	7,5	6	H		95 AU V142	24332131	○
125	145	14,6	16	10	7	H	ISO	95 AU V142	24302159	●
140	160	14,6	16	10	7	H	ISO	95 AU V142	24302160	●
170	185	14,6	16	7,5	6	H		95 AU V142	24306416	●
170	190	14,6	16	10	7	H		95 AU V142	24377490	○
180	195	11,4	12,5	7,5	6	H		95 AU V142	24377491	○
180	200	19,1	21	10	7	H		95 AU V142	24332132	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring T 24

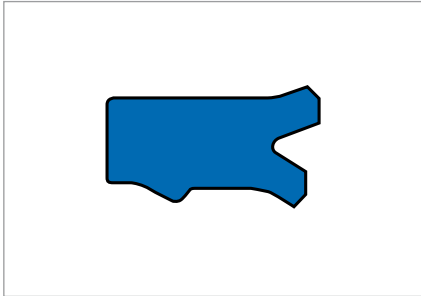


Fig. 1 Merkel U-Ring T 24

Product description

Merkel U-ring with asymmetrical profile, inner lip set back, additional support edge and sealing edge and press fit at the outside diameter.

Product advantages

Single-acting rod seal especially for telescopic cylinders and radially restricted housings

- Very good static and dynamic tightness
- Additional sealing edge prevents ingress of dirt to a large degree
- (Note: low dynamic deformation value, therefore not suitable for sealing systems).

Application

Telescopic cylinders.

Material

Material	Code	Hardness
Novathan (polyurethane)	95 AU V142	95 Shore A

Operating conditions

Material	95 AU V142
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile	Max. permissible gap dimension		
	16 MPa	26 MPa	32 MPa
4	0,50	0,40	0,35

Tolerance recommendation and dimension d2

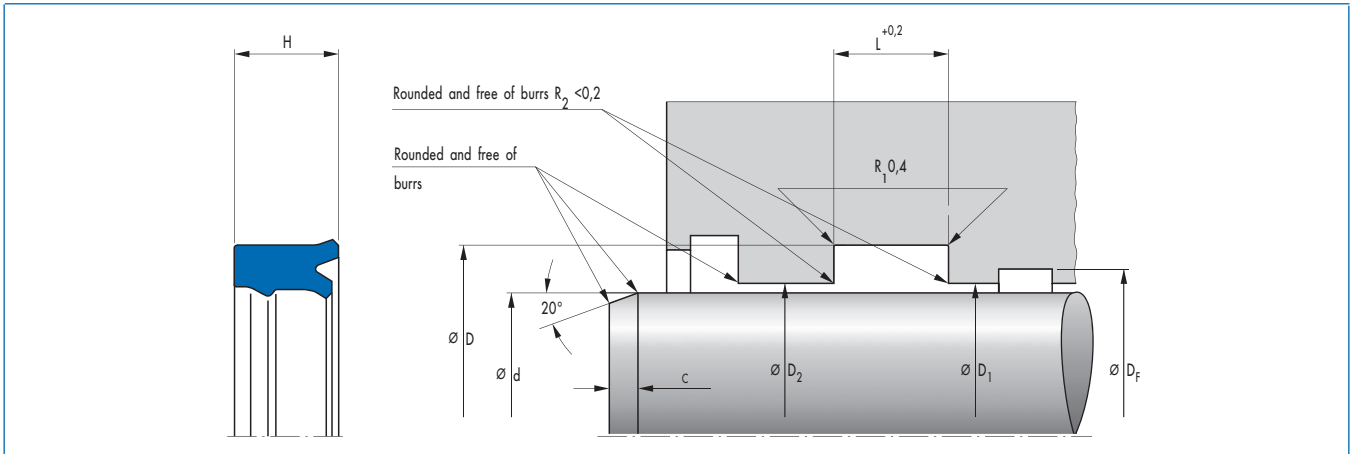
The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

Nominal Ø d	16 MPa		26 MPa		32 MPa	
	d	D	d	D	d	D
45 ... 171	f8	H8	f8	H8	f8	H8

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



d	D	H	L	Profile	C	Fitting	Material	Article No.	
45	53	10,9	12	4	3	H	95 AU V142	24309792	○
50	58	10,9	12	4	3	H	95 AU V142	24309793	○
55	63	10,9	12	4	3	H	95 AU V142	24309794	●
60	68	10,4	12	4	3	H	95 AU V142	24306330	○
65	73	10,9	12	4	3	H	95 AU V142	24314232	○
70	78	10,9	12	4	3	H	95 AU V142	24308889	○
75	83	10,9	12	4	3	H	95 AU V142	24302750	●
80	88	10,9	12	4	3	H	95 AU V142	24306333	●
90	98	10,9	12	4	3	H	95 AU V142	24302751	●
92	100	10,9	12	4	3	H	95 AU V142	24315416	●
93	101	10,9	12	4	3	H	95 AU V142	24308890	○
95	103	10,9	12	4	3	H	95 AU V142	24314233	○
100	108	10,9	12	4	3	H	95 AU V142	24269499	●
105	113	10,9	12	4	3	H	95 AU V142	24302752	○
110	118	10,9	12	4	3	H	95 AU V142	24309795	●
118	126	10,9	12	4	3	H	95 AU V142	24308891	○
120	128	10,9	12	4	3	H	95 AU V142	24302753	●
125	133	10,9	12	4	3	H	95 AU V142	24316541	●
130	138	10,9	12	4	3	H	95 AU V142	24336027	○
143	151	10,9	12	4	3	H	95 AU V142	24308892	○
150	158	10,9	12	4	3	H	95 AU V142	24336028	○
155	163	11,4	12	4	3	H	95 AU V142	24269864	○
171	179	10,9	12	4	3	H	95 AU V142	24308893	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring TM 20

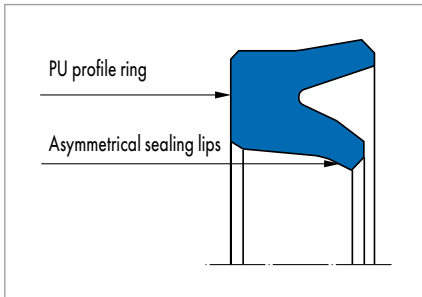


Fig. 1 Merkel U-Ring TM 20

Product description

Merkel U-ring with asymmetrical profile, inner lip set back and press fit at the outside diameter.

Product advantages

Single-acting rod seal for hydraulic cylinders. With new production technology even special sizes can be manufactured quickly and flexibly

- Good media resistance
- Wide operating temperature range
- Very good static and dynamic tightness
- Use as an individual seal or as a secondary seal in sealing systems possible
- Large range of dimensions
- No moulding tools.

Application

Injection moulding machines, presses, heavy machinery manufacture, large cylinders.

Material

Ø range <500

Material	Code	Hardness	Colour
Polyurethane	95 AU V142	95 Shore A	Blue

Ø range >500

Material	Code	Hardness	Colour
Polyurethane	93 AU V168	93 Shore A	Red

Operating conditions

Material	95 AU V142	93 AU V168
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +110	-25 ... +100
HFA fluids	+5 ... +50	+5 ... +60
HFB fluids	+5 ... +50	+5 ... +60
HFC fluids	-30 ... +40	-25 ... +40
HFD fluids	-	-
Water	+5 ... +50	+5 ... +60
HETG (rapeseed oil)	-30 ... +60	-25 ... +60
HEES (synthetic ester)	-30 ... +80	-25 ... +80
HEPG (glycol)	-30 ... +50	-25 ... +50
Mineral greases	-30 ... +110	-25 ... +100
Pressure p in MPa	40	
Running speed v in m/s	0,5*	

* If TM 20 is fitted in a sealing system as a secondary seal, higher running speeds can be allowed.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_c >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation and dimension D2

D2 "System" is based on the use of Merkel TM 20 as a secondary seal in a sealing system. The specified D2 dimensions are based on the use of Merkel fabric-base laminate guide ring SB or metal guide. They provide high security against gap extrusion and also metal tarnish. → Technical Manual. If the stated operating parameters range is not fully exploited or only for a short period, larger D2 dimensions may be selected. With high lateral forces or high deflection we recommend a metal guide.

Housing recommendations for new designs

Merkel U-Ring TM 20 primary seal

d	D	L	c
>320 ... 600	d + 30	25	11
>320 ... 720	d + 40	32	12
>720 ... 2000	d + 40	40	16

Merkel U-Ring TM 20 secondary seal in the sealing system

d	D	L	c
>320 ... 650	d + 20	16	8
>650 ... 950	d + 25	20	10
>950 ... 2000	d + 30	25	11

Tolerance recommendation for SB Guide Ring

<10 MPa				
Nominal Ø d	S	DF	d	D2
≤190	≤15	H8	f8	H10
>190 ... 320	≤15	H7	f8	H9
>320 ... 600	15	H7	f8	H8
>320 ... 720	20	H8	f8	H8
>720 ... 2000	≥25	H8	f8	H8

<25 MPa				
Nominal Ø d	S	DF	d	D2
>105 ... 320	≤15	H7	f8	H8
>320 ... 600	15	H6	f7	H7
>320 ... 720	20	H7	f7	H7
>720 ... 2000	≥25	+0,05	f7	H7

<40 MPa				
Nominal Ø d	S	DF	d	D2
>85 ... 320	≤15	H6	f7	H7
>320 ... 600	15	H6	f6	H7
>320 ... 720	20	H6	f7	H6
>720 ... 2000	≥25	+0,05	f6	H6

System			
Nominal Ø d	DF**	d**	D2
<320	-	-	H11
>320	-	-	+0,4

* Profiles in accordance with "housing recommendations for new designs"

** Use fit or tolerance level of primary seal

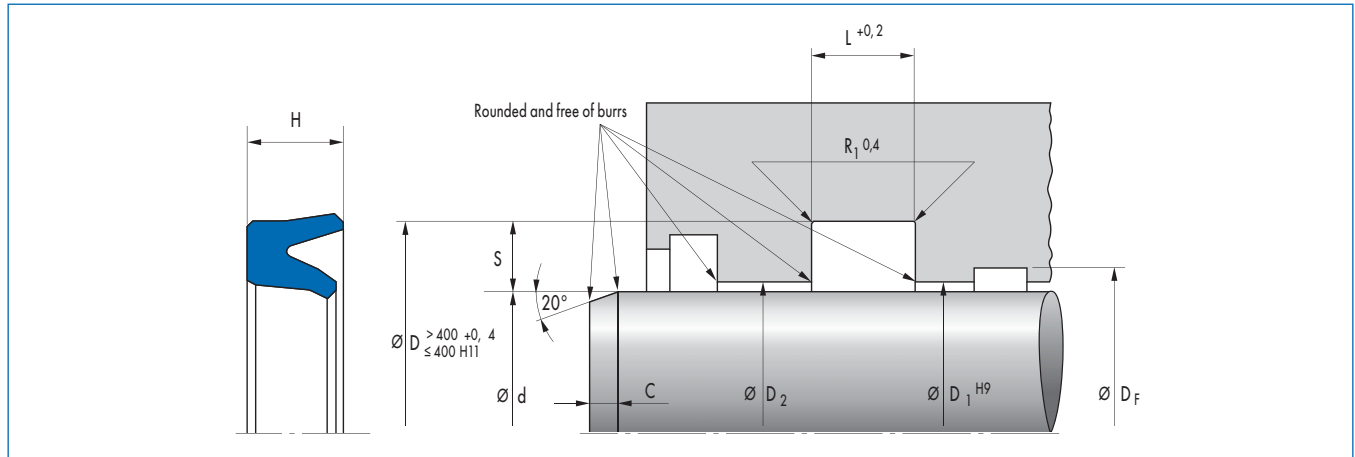
Lead-in chamfers

Dimension C → Technical Manual.

Fitting & installation

The rod seals can be fitted into plunge-cut grooves by hand or with a fitting tool. In the case of different housings, e.g. in old plant, please ask our advisory service.

Article list



d	D	H	L	Profile	C	Fitting	Material	Article No.	
320	340	14,6	16	10	10	S	95 AU V142	24357237	○
320	350	22,8	25	15	11		95 AU V142	24359549	○
320	360	29,1	32	20	14		95 AU V142	24359550	○
330	360	22,8	25	15	11		95 AU V142	24359743	○
350	370	14,6	16	10	10	S	95 AU V142	24357238	○
350	380	22,8	25	15	11		95 AU V142	24359746	○
350	390	29,1	32	20	14		95 AU V142	24359747	○
360	380	14,6	16	10	10	S	95 AU V142	24359719	●
360	400	29,1	32	20	14		93 AU V168	24359748	○
370	400	22,8	25	15	11		95 AU V142	24359749	○
380	400	14,6	16	10	10	S	95 AU V142	24359750	○
380	410	22,8	25	15	11		95 AU V142	49001346	○
380	420	29,1	32	20	14		95 AU V142	24359751	○
390	420	22,8	25	15	11		95 AU V142	24359752	○
400	420	14,6	16	10	10	S	95 AU V142	24359753	○
400	430	22,8	25	15	11		95 AU V142	24359755	○
400	440	29,1	32	20	14		95 AU V142	24359754	○
410	430	14,6	16	10	10	S	95 AU V142	24357239	○
420	460	29,1	32	20	14		95 AU V142	24359757	○
430	460	22,8	25	15	11		95 AU V142	24359758	○
440	460	14,6	16	10	10	S	95 AU V142	24357240	○
440	470	22,8	25	15	11		95 AU V142	24370501	○
450	470	14,6	16	10	10	S	95 AU V142	24359760	○
450	480	22,8	25	15	11		95 AU V142	24359761	○
450	490	29,1	32	20	14		95 AU V142	24359763	○
480	500	14,6	16	10	10	S	95 AU V142	24357241	●
500	520	14,6	16	10	10		93 AU V167	24359767	○
500	530	22,8	25	15	11		93 AU V168	24359768	○
500	540	29,1	32	20	14		93 AU V168	24359769	○
520	560	29,1	32	20	14		93 AU V168	24359770	○
530	560	22,8	25	15	11		93 AU V168	24359771	○
540	580	29,1	32	20	14		93 AU V168	24359772	○
550	570	14,6	16	10	10	S	93 AU V168	24357242	○
550	590	29,1	32	20	14		93 AU V168	24359204	○
560	600	29,1	32	20	14		93 AU V168	24359773	○

● Available from stock ○ On request: Tool is available, delivery at short notice

S = only as secondary seal

d	D	H	L	Profile	C	Fitting	Material	Article No.	
580	610	22,8	25	15	14		93 AU V168	49001720	○
580	620	29,1	32	20	14		93 AU V168	24359774	○
600	620	14,6	16	10	10	S	93 AU V168	24359775	○
600	630	22,8	25	15	11		93 AU V168	24359776	○
600	640	29,1	32	20	14		93 AU V168	24359777	○
620	640	14,6	16	10	10	S	93 AU V168	24359551	○
630	670	29,1	32	20	14		93 AU V168	24359778	○
640	660	14,6	16	10	10	S	93 AU V168	24358387	○
670	695	18,2	20	12,5	11	S	93 AU V168	24359552	○
670	710	29,1	32	20	14		93 AU V168	24359779	○
710	750	29,1	32	20	14		93 AU V168	24359780	○
720	745	18,2	20	12,5	11		93 AU V168	49004523	○
720	760	29,1	32	20	13		93 AU V168	24359781	○
720	770	36,4	40	25	16		93 AU V168	24357182	○
750	800	36,4	40	25	16		93 AU V168	24359782	○
800	825	18,2	20	12,5	11	S	93 AU V168	24359783	○
820	870	36,4	40	25	16		93 AU V168	24357250	○
830	855	18,2	20	12,5	11		93 AU V168	49003544	○
900	925	18,2	20	12,5	11	S	93 AU V168	24359788	○
900	950	36,4	40	25	16		93 AU V168	24359789	○
950	975	18,2	20	12,5	11	S	93 AU V168	24359554	○
1000	1030	22,8	25	15	11	S	93 AU V168	24359555	○
1000	1050	36,4	40	25	16		93 AU V168	24359792	○
1040	1070	22,8	25	15	16		93 AU V168	49017258	○
1050	1100	36,4	40	25	16		93 AU V168	24359793	○
1070	1120	36,4	40	25	16		93 AU V168	24359794	○
1150	1200	36,4	40	25	16		93 AU V168	24359795	○
1200	1250	36,4	40	25	16		93 AU V168	24362258	○
1250	1300	36,4	40	25	16		93 AU V168	24359556	○

● Available from stock ○ On request: Tool is available, delivery at short notice

S = only as secondary seal

Merkel U-Ring TM 23

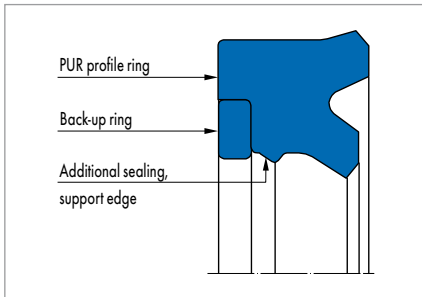


Fig. 1 Merkel U-Ring TM 23

Product description

The Merkel U-Ring TM 23 is specially designed for sealing the piston rods of plungers, pushers and subsidiary cylinders in self-advancing support systems.

Product advantages

To meet the requirements of a higher radial deflection and larger gap bridging, the Merkel U-Ring TM 23 has been fitted with an increased pre-load and active back-up ring. The second sealing edge provides extra protection against the ingress of dirt particles.

- Good media resistance
- Very good static and dynamic tightness
- Large range of dimensions
- Bridges large gaps
- Highly wear-resistant.

Application

Mining.

Material

Material	Code	Hardness
Novathan (polyurethane)	95 AU V157/ 93 AU V167	95 Shore A/93 Shore A

Operating conditions

Material	95 AU V157/ 93 AU V167
	Temperature range in °C
HFA fluids/water	+5 ... +60
Pressure p in MPa	50
Running speed v in m/s	<0,1*

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% up to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Recommended profile

d	S	L
<60	6,0	9,6
60 ... 120	7,5	12,5
120 ... 200	10,0	16,0
200 ... 300	12,5	20,0
>300	15,0	22,0

Other dimensions are possible. Please ask.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile		Max. permissible gap dimension			
L	Profile	16 MPa	26 MPa	32 MPa	50 MPa
12,5	7,5	0,8	0,7	0,50	0,4
>12,5 ... 16,0	>7,5 ... 10,0	1,2	1,0	0,65	0,5
>16,0	>10,0	1,8	1,4	0,90	0,7

Tolerance recommendation and dimension d2

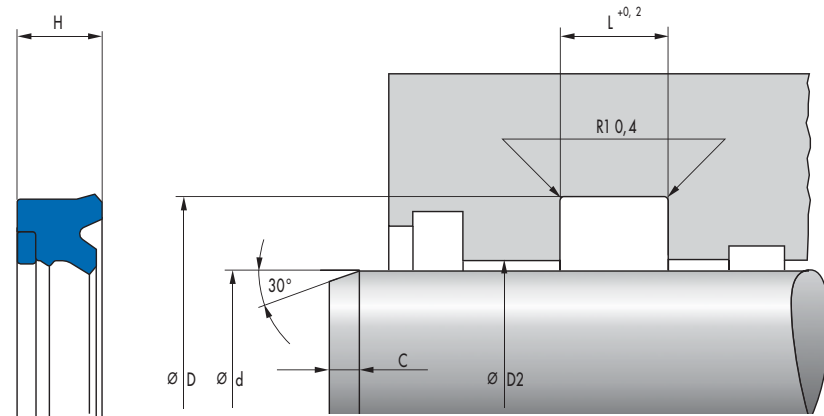
The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

Nominal Ø d	d	D
≤350	f7	H10

Fitting & installation

The U-rings can be fitted into plunge-cut grooves by hand or with a fitting tool. We will be pleased to send you a design drawing for this on enquiry.

Article list



d	D	H	L	Profile	C	Material	Article No.	
60	72	11,4	13	6	6	95 AU V157	24301853	○
70	85	11,4	13	7,5	7	95 AU V157	24296870	○
80	92	10,9	12	6	6	95 AU V157	24301858	○
80	95	14,6	16	7,5	7	95 AU V157	24309920	○
85	100	11,4	13	7,5	7	93 AU V167	24359397	○
90	110	14,6	16	10	8,5	95 AU V157	24296871	○
95	110	11,4	13	7,5	7	95 AU V157	24328307	○
100	115	10,5	12	7,5	7	95 AU V157	24315670	○
100	115	14,6	16	7,5	7	95 AU V157	24268764	○
110	125	14,6	16	7,5	7	95 AU V157	24313031	○
110	130	14,6	16	10	8,5	95 AU V157	24296872	○
120	135	11,4	13	7,5	7	95 AU V157	24296681	○
120	135	14,6	16	7,5	7	95 AU V157	24313025	○
125	140	11,4	13	7,5	7	95 AU V157	24294247	○
135	155	14,6	16	10	8,5	93 AU V167	24369133	○
140	160	14,6	16	10	8,5	95 AU V157	24265472	○
145	162	14,6	16	8,5	8	95 AU V157	24372351	○
145	165	16	17,5	7,5	8,5	93 AU V167	24354392	○
149	165	18,2	20	8	7	95 AU V157	24299881	○
150	165	14,6	16	7,5	7	95 AU V157	24313029	○
150	168	19,1	21	9	8	95 AU V157	24328308	○
155	170	14,6	16	7,5	7	95 AU V157	24313030	○
155	175	14,6	16	10	8,5	95 AU V157	24268763	○
160	175	14,6	16	7,5	7	95 AU V157	24308961	○
165	180	11,4	13	7,5	7	95 AU V157	24309919	○
165	182	11,4	13	8,5	8	95 AU V157	24315950	○
165	182	14,6	16	8,5	8	93 AU V167	24366938	○
170	185	14,6	16	7,5	7	95 AU V157	24292396	○
170	190	14,6	16	10	8,5	95 AU V157	24338291	○
180	195	11,4	16	7,5	7	95 AU V157	24296682	○
180	195	14,6	16	7,5	7	95 AU V157	24299882	○
180	200	14,6	16	10	8,5	93 AU V167	24374346	○
180	200	19,1	21	10	8,5	95 AU V157	24293702	○
185	200	20,6	23	7,5	7	93 AU V167	24374555	○
185	210	18,2	20	12,5	7	95 AU V157	24314005	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	Material	Article No.	
185	214	18,2	20	14,5	11	95 AU V157	24299628	<input type="radio"/>
190	210	14,6	16	10	8,5	95 AU V157	24265473	<input type="radio"/>
195	210	14,6	16	7,5	7	93 AU V167	24356464	<input type="radio"/>
195	215	14,6	16	10	8,5	93 AU V167	24366936	<input type="radio"/>
205	220	14,6	16	7,5	7	95 AU V157	24313032	<input type="radio"/>
205	225	14,6	16	10	8,5	95 AU V157	24327442	<input type="radio"/>
210	230	14,6	16	10	8,5	93 AU V167	24358106	<input type="radio"/>
210	235	18,2	20	12,5	9,5	95 AU V157	24263447	<input type="radio"/>
220	235	14,6	16	7,5	7	95 AU V157	24262955	<input type="radio"/>
222	237	20,2	23	7,5	7	95 AU V157	24337054	<input type="radio"/>
225	250	18,2	20	12,5	9,5	93 AU V167	24366939	<input type="radio"/>
230	255	22,8	25	12,5	9,5	95 AU V157	24293703	<input type="radio"/>
235	255	14,6	16	10	8,5	95 AU V157	24299884	<input type="radio"/>
245	270	18,2	20	12,5	9,5	95 AU V157	24314006	<input type="radio"/>
260	280	16,6	18	10	8,5	93 AU V167	24374345	<input type="radio"/>
265	294	20	22	14,5	11	95 AU V157	24299629	<input type="radio"/>
275	300	18,2	20	12,5	9,5	95 AU V157	24265474	<input type="radio"/>
285	310	18,2	20	12,5	9,5	95 AU V157	24380148	<input type="radio"/>
290	315	18,2	20	12,5	9,5	95 AU V157	24316205	<input type="radio"/>
305	330	18,2	20	12,5	9,5	93 AU V167	24263445	<input type="radio"/>
325	355	20	22	15	8	93 AU V167	24359407	<input type="radio"/>

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel U-Ring Syprim SM

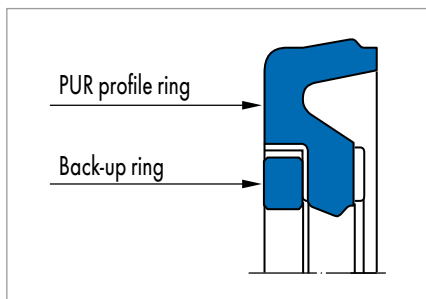


Fig. 1 Merkel U-Ring Syprim SM

Product description

Two-piece Merkel seal set for use as a primary rod seal. The Merkel Syprim SM seal set is always used in a sealing system in combination with U-ring (e.g. Merkel U-Ring T 20).

Product advantages

The Merkel U-Ring Syprim SM is designed especially for use as a system seal

- Short primary seal
- No pressure enclosed between primary and secondary seal
- Low friction
- Highly wear-resistant
- Protection against extrusion through activated back-up ring.

Application

Earth moving equipment, agricultural machinery, injection moulding machines, industrial vehicles, cranes, standard cylinders.

Material

PUR profile ring

Material	Code	Hardness
Polyurethane	95 AU V142	95 Shore A

Back-up ring

Material	Code
Polyacetal	POM PO202

Operating conditions

Material	95 AU V142/POM PO202
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-40 ... +110
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_p >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile		Max. permissible gap dimension			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
6,3	7,55	0,6	0,5	0,4	0,4
8,1	10,25	0,7	0,6	0,5	0,5

Tolerance recommendation and dimension D2

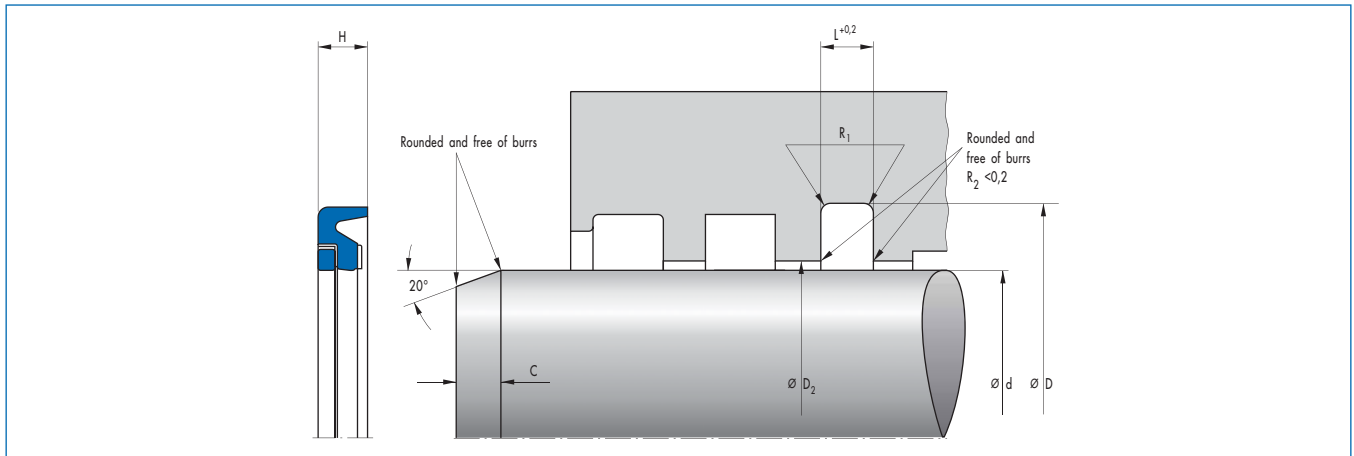
The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

Nominal Ø d	d	D
45 ... 80	f8	H9
>80 ... 200	f8	H8

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



d	D	H	L	Profile	C	R ₁	Fitting	Material	Article No.	
40	55,1	5,9	6,3	7,55	5,5	1,2	H	95 AU V142	24360070	○
42	57,1	5,9	6,3	7,55	5,5	1,2	H	95 AU V142	24356005	○
45	60,1	5,9	6,3	7,55	5,5	1,2	H	95 AU V142	24355139	●
50	65,1	5,9	6,3	7,55	5,5	1,2	H	95 AU V142	24341750	●
54	69,1	5,9	6,3	7,55	5,5	1,2	H	95 AU V142	24370654	○
56	71,1	5,9	6,3	7,55	5,5	1,2	H	95 AU V142	24351367	○
60	75,1	5,9	6,3	7,55	5,5	1,2	H	95 AU V142	24352073	●
63	78,1	5,9	6,3	7,55	5,5	1,2	H	95 AU V142	24356949	●
70	85,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	24345981	●
80	95,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	24355289	●
85	100,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	24341751	○
90	105,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	24359197	●
100	115,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	24332507	●
105	120,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	24369062	○
110	125,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	528762	○
115	130,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	533605	○
120	135,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	24368150	○
125	140,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	24357329	●
150	165,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	24357330	○
170	185,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	24357331	○
180	195,1	5,9	6,3	7,55	6	1,2	H	95 AU V142	24357332	○
200	220,5	7,6	8,1	10,25	7,5	2	H	95 AU V142	24357333	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring Seal Set 0214

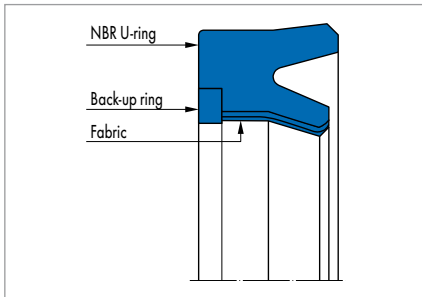


Fig. 1 Merkel U-Ring Seal Set 0214

Product description

Two-piece Merkel seal set comprising an elastomer U-ring with an elastomer sealing edge, fabric reinforcement on the contact area and an active back-up ring.

Product advantages

Single-acting rod seal for use in hydraulics and pneumatics

- Low friction due to fabric reinforcement
- Large range of dimensions
- Protection against extrusion through activated back-up ring
- Low deformation value (not suitable for sealing systems)
- Easily installed in non-axial housings
- From 100 mm diameter.

Application

Injection moulding machines, iron and steel technology, presses, special cylinders, marine hydraulics, steel hydraulics engineering, scrap cutters.

Material

U-Ring

Material	Code
NBR	80 NBR B246
Cotton fabric	BI-NBR B4 B248

Back-up ring

D	Material	Code
<300 mm	Polyacetal POM	POM PO202
>300 mm	Polyamide	PA 6.G200

Other materials like PTFE bronze back-up ring on enquiry.

Operating conditions

Material	80 NBR B246/BI-NBR B4B248/ POM PO202	80 NBR B246/BI-NBR B4B248/ PA 6.G200
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +100
HFA fluids	+5 ... +60	+5 ... +60
HFB fluids	+5 ... +60	+5 ... +60
HFC fluids	-30 ... +60	-30 ... +60
HFD fluids	-	-
Water	+5 ... +100	+5 ... +100
HETG (rapeseed oil)	-30 ... +80	-30 ... +80
HEES (synthetic ester)	-30 ... +80	-30 ... +80
HEPG (glycol)	-30 ... +60	-30 ... +60
Mineral greases	-30 ... +100	-30 ... +100
Pressure p in MPa Hydraulic	25 or 40*	
Pressure p in MPa Pneumatic	5	
Running speed v in m/s	1,5	

* max. pressure depends on the profile.

For Merkel U-Ring Seal Sets 0214, if long strokes are traversed, the max. pressure should only be applied to the last part of the stroke (closing pressure); during the stroke max. 16 MPa.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension X2

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile	16 MPa			26 MPa			32 MPa			40 MPa		
	D	d	X2	D	d	X2	D	d	X2	D	d	X2
<15	H10	f7	1,2	H10	f7	1,0	H10	f7	0,65	H10	f7	0,5
>15	H10	f7	1,8	H10	f7	1,4	H10	f7	0,9	H10	f7	0,7

The dimensions D1 and DF are to be viewed in connection with the sealing component used.

Tolerance recommendation

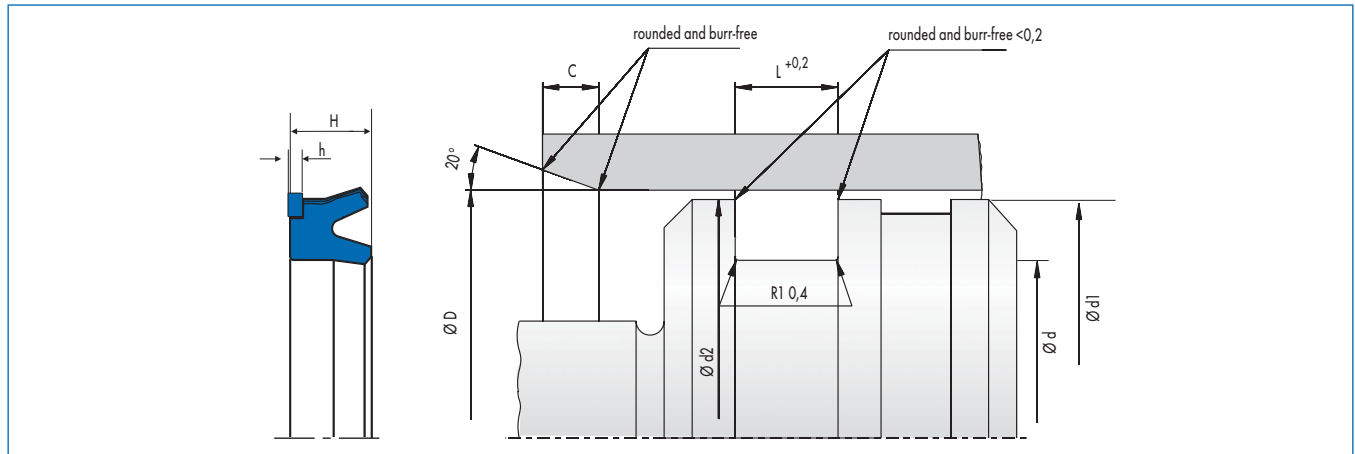
The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



d	D	H	L	Profile	C	Material	Article No.	
140	170	18	19	15	7,5	80 NBR B246	24314112	○
150	180	18	19	15	7,5	80 NBR B246	24296304	○
170	195	18,5	20	12,5	6,5	80 NBR B246	24299328	○
170	200	22	23	15	7,5	80 NBR B246	24294436	○
180	210	18	19	15	7,5	80 NBR B246	24245484	○
180	210	22	23	15	7,5	80 NBR B246	24315582	○
190	220	22	23	15	7,5	80 NBR B246	24262669	○
210	240	22	23	15	7,5	80 NBR B246	24251000	○
220	250	19	20	15	7,5	80 NBR B246	24245485	○
240	270	22	23	15	7,5	80 NBR B246	24243972	○
250	280	22	23	15	7,5	80 NBR B246	24265061	○
270	300	22	23	15	7,5	80 NBR B246	24266413	○
280	310	22	23	15	7,5	80 NBR B246	24265062	○
300	330	22	23	15	7,5	80 NBR B246	24237123	○
300	340	24	25	20	10	80 NBR B246	24245487	○
320	360	20	21	20	10	80 NBR B246	24245104	○
320	360	30	32	20	10	80 NBR B246	24262827	○
350	380	25	26	15	7,5	80 NBR B246	24248695	○
350	390	30	32	20	10	80 NBR B246	49000836	○
370	400	25	26	15	7,5	80 NBR B246	24310654	○
380	420	30	32	20	10	80 NBR B246	24265065	○
390	420	25	26,5	15	7,5	80 NBR B246	24289371	○
420	450	25	26,5	15	7,5	80 NBR B246	24299742	○
450	490	30	32	20	10	80 NBR B246	24227265	○
480	520	30	32	20	10	80 NBR B246	24245108	○
500	540	30	32	20	10	80 NBR B246	24245110	○
530	560	25	26,5	15	7,5	80 NBR B246	24293085	○
560	600	25	26	20	10	80 NBR B246	24287009	○
580	620	30	32	20	10	80 NBR B246	24245106	○
800	850	32	34	25	12,5	80 NBR B246	24300506	○
850	890	30	32	20	10	80 NBR B246	24311337	○
1000	1050	37,5	40	25	12,5	80 NBR B246	24293084	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel U-Ring Seal Set 0216

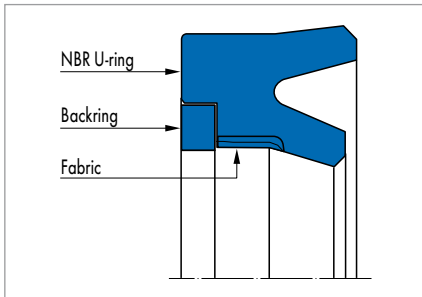


Fig. 1 Merkel U-Ring Seal Set 0216

Product description

Two-piece Merkel seal set comprising an elastomer U-ring with an elastomer sealing edge, fabric reinforcement on the contact area and an active back-up ring. Merkel U-Ring Seal Set 0216 can also be used for pneumatic applications.

Product advantages

Single-acting rod seal for use in hydraulics and pneumatics

- Low friction due to fabric part
- Large range of dimensionse
- Protection against extrusion through activated back-up ring
- Low deformation value (not suitable for sealing systems)
- Easily installed in non-axial housings
- From 100 mm diameter.

Application

Pneumatic applications.

Material

U-ring

Material	Code
NBR	80 NBR B246
Cotton fabric	BI-NBR B4 B248

Back-up ring

D	Material	Code
<300 mm	Polyacetal POM	POM PO202
>300 mm	Polyamide	PA 6.G200

Other materials like PTFE bronze back-up ring on enquiry.

Operating conditions

Material	80 NBR B246/BI-NBR B4B248/ POM PO202	80 NBR B246/BI-NBR B4B248/ PA 6.G200
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +100
HFA fluids	+5 ... +60	+5 ... +60
HFB fluids	+5 ... +60	+5 ... +60
HFC fluids	-30 ... +60	-30 ... +60
HFD fluids	-	-
Water	+5 ... +100	+5 ... +100
HETG (rapeseed oil)	-30 ... +80	-30 ... +80
HEES (synthetic esters)	-30 ... +80	-30 ... +80
HEPG (glycol)	-30 ... +60	-30 ... +60
Mineral greases	-30 ... +100	-30 ... +100
Pressure p in MPa Hydraulic	25 or 40*	
Pressure p in MPa Pneumatic	5	
Running speed v in m/s	1,5	

* max. pressure depends on the profile

For Merkel U-Ring Seal Sets 0216, if long strokes are traversed, the max. pressure should only be applied to the last part of the stroke (closing pressure); during the stroke max. 16 MPa.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension X2

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile	16 MPa			26 MPa			32 MPa			40 MPa		
	D	d	X2	D	d	X2	D	d	X2	D	d	X2
<15	H10	f7	1,2	H10	f7	1,0	H10	f7	0,65	H10	f7	0,5
>15	H10	f7	1,8	H10	f7	1,4	H10	f7	0,90	H10	f7	0,7

The dimensions D1 and DF are to be viewed in connection with the sealing component used.

Tolerance recommendation

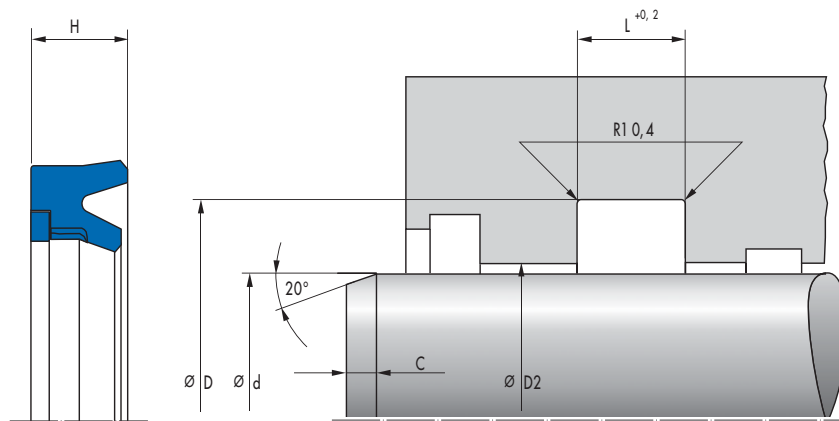
The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



d	D	H	L	Profile	C	Material	Article No.	
125	155	18	19	15	7,5	80 NBR B246	24291122	○
140	170	18	19	15	7,5	80 NBR B246	24314111	○
170	200	22	23	15	7,5	80 NBR B246	24275197	○
180	210	18	19	15	7,5	80 NBR B246	24245114	○
200	230	22	23	15	7,5	80 NBR B246	24290483	○
210	240	22	23	15	7,5	80 NBR B246	24275209	○
250	280	22	23	15	7,5	80 NBR B246	24269898	○
260	290	22	23	15	7,5	80 NBR B246	24316621	○
270	300	22	23	15	7,5	80 NBR B246	24266414	○
280	310	22	23	15	7,5	80 NBR B246	24269899	○
300	330	22	23	15	7,5	80 NBR B246	24245117	○
320	350	22	23	15	7,5	80 NBR B246	24269900	○
320	360	30	32	20	10	80 NBR B246	24248351	○
350	380	25	26	15	7,5	80 NBR B246	24250321	○
360	400	30	32	20	10	80 NBR B246	24290064	○
370	400	25	26	15	7,5	80 NBR B246	24310655	○
380	420	30	32	20	10	80 NBR B246	24275210	○
390	420	25	26,5	15	7,5	80 NBR B246	24289372	○
400	430	22	23	15	7,5	80 NBR B246	24308105	○
420	450	25	26,5	15	7,5	80 NBR B246	24299741	○
450	480	25	26	15	7,5	80 NBR B246	24274570	○
450	490	30	32	20	10	80 NBR B246	24228307	○
475	515	30	32	20	10	80 NBR B246	24234174	○
480	520	30	32	20	10	80 NBR B246	24232822	○
500	530	25	26,5	15	7,5	80 NBR B246	24289342	○
530	560	25	26,5	15	7,5	80 NBR B246	24293086	○
540	580	30	32	20	10	80 NBR B246	24288874	○
560	600	25	26	20	10	80 NBR B246	24287008	○
580	620	30	32	20	10	80 NBR B246	24234580	○
600	630	25	26	15	7,5	80 NBR B246	24275198	○
600	640	30	32	20	10	80 NBR B246	24237292	○
670	710	25	26,5	20	10	80 NBR B246	24293600	○
720	760	30	32	20	10	80 NBR B246	24361403	○
800	850	32	34	25	12,5	80 NBR B246	24361423	○
850	890	30	32	20	10	80 NBR B246	24311336	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	Material	Article No.	
890	920	25	26	15	12,5	80 NBR B246	24345895	<input type="radio"/>
975	1025	37,5	40	25	12,5	80 NBR B246	24361424	<input type="radio"/>
1000	1050	37,5	40	25	12,5	80 NBR B246	24293083	<input type="radio"/>
1070	1120	31	33	25	12,5	80 NBR B246	24361426	<input type="radio"/>

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel U-Ring TMP 20

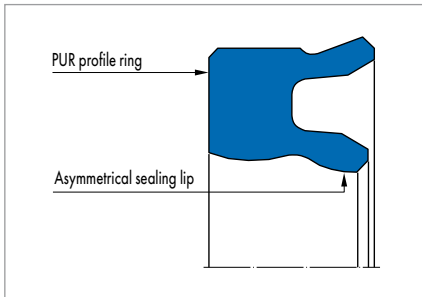


Fig. 1 Merkel U-Ring TMP 20

Product description

Single-acting rod seal made of abrasion-resistant polyurethane.

Product advantages

Rod seal for heavy-duty pneumatic stresses and strains and high operating requirements. New production technology allows special sizes to be manufactured quickly and flexibly. The Merkel U-rings are designed for pressure on one side

- High tightness
- Suitable for dry air
- Large range of dimensions
- No mould tools required.

Application

Presses, large cylinders.

Material

Ø range <500 mm

Material	Code	Hardness	Colour
Polyurethane	93 AU V167	93 Shore A	Red

Ø range >500 mm

Material	Code	Hardness	Colour
Polyurethane	93 AU V168	93 Shore A	Red

Operating conditions

Material	93 AU V167/93 AU V168
Temperature range in °C	
HFA fluids/water	-10 ... +80
Pressure p in MPa	2*
Running speed v in m/s	1,5

* short version <1,2 MPa

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%. Abrasive surfaces, ridges, scratches and blow-holes must be avoided.

Design notes

Please observe our general design notes in → Technical Manual.

Housing recommendations for new designs

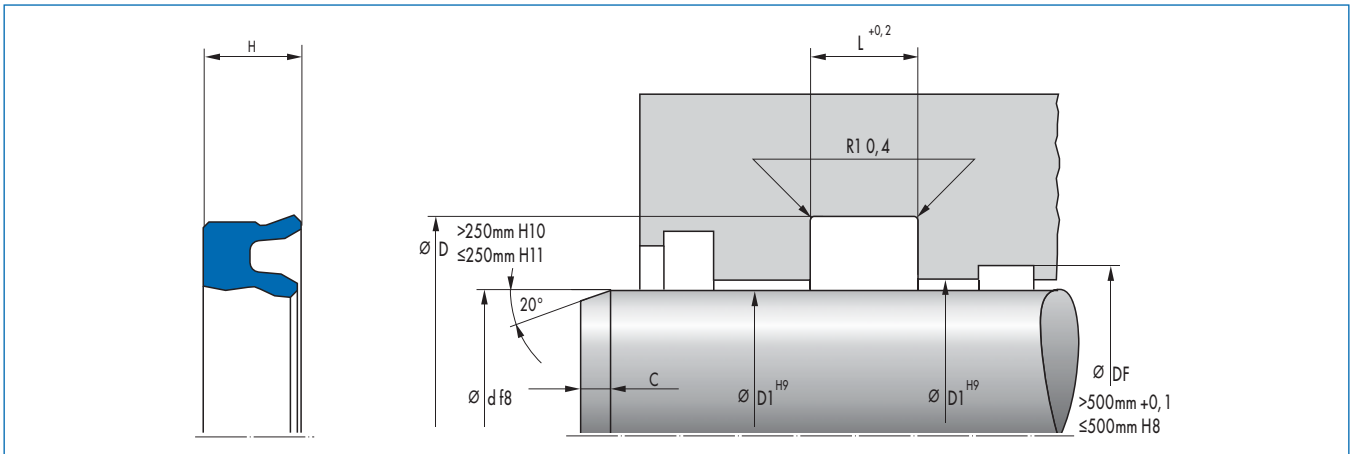
d	D	L	c
>50 ... 200	d + 20	16	8,5
>100 ... 320	d + 25	20	10,0
>150 ... 630	d + 30	24	11,5
>400 ... 800	d + 40	32	12,5
>800 ... 1200	d + 50	40	16,0
>1000 ... 2000	d + 60	48	18,0

Fitting & installation

The rod seals can be inserted into plunge-cut grooves by hand or with a fitting tool. In the case of different housings, such as in old plant, please ask our

advisory service. For optimum running-in and operation behaviour the U-rings should be lightly oiled or greased prior to use (initial lubrication).

Article list



d	D	H	Profile	L	C	Material	Article No.	
50	70	14,6	10	16	8,5	93 AU V167	24377712	○
60	80	14,6	10	16	8,5	93 AU V167	24377711	○
80	100	14,6	10	16	8,5	93 AU V167	24370305	○
90	110	14,6	10	16	8,5	93 AU V167	24370306	○
100	120	14,6	10	16	8,5	93 AU V167	24370307	○
110	130	14,6	10	16	8,5	93 AU V167	24370308	○
160	180	14,6	10	16	8,5	93 AU V167	24371779	○
170	200	20,9	15	23	11,5	93 AU V167	24368238	○
180	210	20,9	15	23	11,5	93 AU V167	24368239	○
210	240	20,9	15	23	11,5	93 AU V167	24368242	○
220	250	20,9	15	23	11,5	93 AU V167	24368243	○
240	270	20,9	15	23	11,5	93 AU V167	24367642	○
250	280	20,9	15	23	11,5	93 AU V167	24368244	○
270	300	20,9	15	26	11,5	93 AU V167	24368245	○
280	310	20,9	15	23	11,5	93 AU V167	24368246	○
330	360	20,9	15	23	11,5	93 AU V167	49001221	○
350	380	23,7	15	23	11,5	93 AU V167	24368249	○
370	400	23,7	15	26	11,5	93 AU V167	24368250	○
390	420	23,7	15	26	11,5	93 AU V167	24368251	○
400	430	23,7	15	26	11,5	93 AU V167	24368252	○
420	450	23,7	15	26	11,5	93 AU V167	24368253	○
440	470	23,7	15	26	11,5	93 AU V167	526870	○
450	480	23,7	15	26	11,5	93 AU V167	24367970	○
500	530	23,7	15	23	11,5	93 AU V167	24368255	○
670	710	24,9	15	27	11,5	93 AU V168	24368259	○
750	800	32	25	34	16	93 AU V168	24368261	○
800	850	32	25	34	16	93 AU V168	24368262	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Omegat OMS-MR

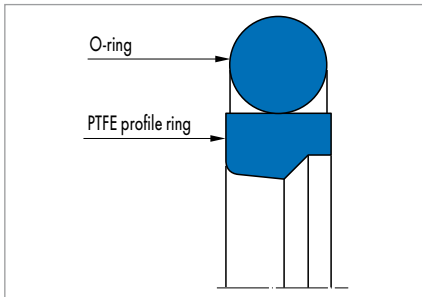


Fig. 1 Merkel Omegat OMS-MR

Product description

Two-piece Merkel seal set made of PTFE profile ring with one O-ring as a pre-load component.

Product advantages

Rod seal used in particular in a sealing system

- Very high resistance to pressure
- Good thermal conductivity
- Very good extrusion resistance
- High resistance to abrasion
- Low friction, free of stick-slip.

Application

Industrial vehicles, handling equipment, agricultural machinery, cranes, injection moulding machines, presses, marine hydraulics, control and regulation equipment, mills.

Material

PTFE profile ring

Material	Code
PTFE bronze compound	PTFE B602
PTFE glass/MoS ₂ compound	PTFE GM201

O-ring

Material	Code	Hardness
NBR	70 NBR B276	70 Shore A
FKM	70 FKM K655	70 Shore A

Operating conditions

Material	PTFE GM201/NBR	PTFE B602/ 70 FKM K655	PTFE B602/ 70 NBR B276
	Temperature range in °C		
Hydraulic oils HL, HLP	-30 ... +100	-10 ... +200	-30 ... +100
HFA fluids	+5 ... +60	-	-
HFB fluids	+5 ... +60	-	-
HFC fluids	-30 ... +60	-	-
HFD fluids	-	-10 ... +200	-
Water	+5 ... +100	-	-
HETG (rapeseed oil)	-30 ... +80	-10 ... +80	-30 ... +80
HEES (synthetic ester)	-30 ... +80	-10 ... +100	-30 ... +80
HEPG (glycol)	-30 ... +60	-10 ... +80	-30 ... +60
Mineral greases	-30 ... +100	-10 ... +200	-30 ... +100
Pressure p in MPa	40		
Running speed v in m/s	5		

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_c >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile		Max. permissible gap dimension			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
2,2	2,45	0,35	0,30	-	-
3,2	3,65	0,40	0,35	-	-
4,2	5,35	0,50	0,40	0,30	-
6,3	7,55	0,55	0,45	0,35	0,30
8,1	10,25	0,60	0,50	0,40	0,40
8,1	12,00	0,70	0,60	0,55	0,50
9,5	13,65	0,75	0,65	0,60	0,55

Tolerance recommendation and dimension D2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

Nominal Ø d	16 MPa		26 MPa		32 MPa		40 MPa	
	d	D	d	D	d	D	d	D
≤80	f8	H9	f8	H9	f7	H9	f7	H7
>80 ... 500	f8	H8	f8	H8	f7	H8	f7	H8
>500 ... 1450	f8	H8	f7	H8	f7	H8	f7	H8

The dimensions D1 and DF are to be viewed in connection with the guide elements used.

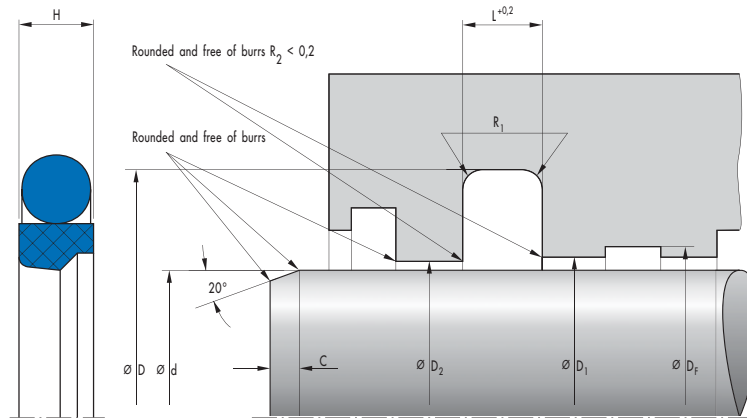
Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

d	D	H	L	Profile	C	R ₁	Material	Article No.	
20	30,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24178433	●
22	29,3	3	3,2	3,65	3	0,5	PTFE GM201 / NBR	24131171	●
22	29,3	3	3,2	3,65	3	0,5	PTFE B602 / NBR	24223120	●
22	29,3	3	3,2	3,65	3	0,5	PTFE B602 / FKM	24332956	○
22	32,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24131206	●
22	32,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24290506	○
22	32,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24178434	●
25	32,3	3	3,2	3,65	3	0,5	PTFE GM201 / NBR	24131172	●
25	32,3	3	3,2	3,65	3	0,5	PTFE B602 / NBR	24223123	●
25	32,3	3	3,2	3,65	3	0,5	PTFE B602 / FKM	24245536	●
25	35,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24131207	●
25	35,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24344719	○
25	35,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24178435	●
28	35,3	3	3,2	3,65	3	0,5	PTFE GM201 / NBR	24131173	○
28	35,3	3	3,2	3,65	3	0,5	PTFE B602 / NBR	24223126	●
28	35,3	3	3,2	3,65	3	0,5	PTFE B602 / FKM	24296908	●
28	38,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24131208	●
28	38,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24311631	●
28	38,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24178436	●
30	37,3	3	3,2	3,65	3	0,5	PTFE GM201 / NBR	24131174	●
30	37,3	3	3,2	3,65	3	0,5	PTFE B602 / NBR	24223129	●
30	37,3	3	3,2	3,65	3	0,5	PTFE B602 / FKM	24268382	○
30	40,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24108645	○
30	40,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24263335	●
30	40,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24178437	●
32	39,3	3	3,2	3,65	3	0,5	PTFE GM201 / NBR	24131175	○
32	39,3	3	3,2	3,65	3	0,5	PTFE B602 / NBR	24223132	●
32	39,3	3	3,2	3,65	3	0,5	PTFE B602 / FKM	24250622	●
32	42,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24122880	●
32	42,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24296466	○
32	42,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24178438	●
35	42,3	3	3,2	3,65	3	0,5	PTFE GM201 / NBR	24131176	○
35	42,3	3	3,2	3,65	3	0,5	PTFE B602 / NBR	24223135	●
35	42,3	3	3,2	3,65	3	0,5	PTFE B602 / FKM	24309807	○
35	45,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24131209	●
35	45,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24296131	○
35	45,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24178439	●
36	43,3	3	3,2	3,65	3	0,5	PTFE GM201 / NBR	24131177	●
36	43,3	3	3,2	3,65	3	0,5	PTFE B602 / NBR	24223138	●
36	43,3	3	3,2	3,65	3	0,5	PTFE B602 / FKM	24246483	○
36	46,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24113843	●
36	46,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24315180	○
36	46,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24178440	●
40	50,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24131178	●
40	50,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24223147	●
40	50,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24238040	○
40	55,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24113841	●
40	55,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / FKM	24262761	○
40	55,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	24178441	●
42	52,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24131179	○

● Available from stock ○ On request: Tool is available, delivery at short notice

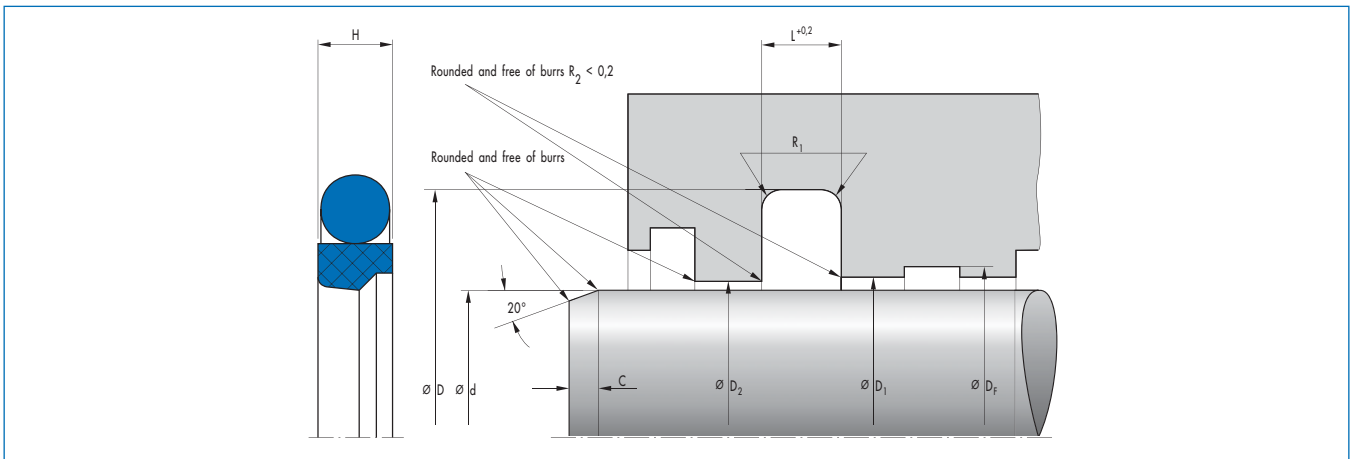


d	D	H	L	Profile	C	R ₁	Material	Article No.	
42	52,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24223150	●
42	52,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24300453	○
42	57,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24131210	○
42	57,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / FKM	24314958	○
42	57,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	24178442	●
45	55,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24131180	●
45	55,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24223153	●
45	55,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24260922	●
45	60,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24101569	●
45	60,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / FKM	24334150	○
45	60,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	24178443	●
50	60,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24131181	●
50	60,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24223156	●
50	60,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24232029	○
50	65,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24131211	●
50	65,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / FKM	24262762	●
50	65,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	24178444	●
55	65,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24262485	○
55	65,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24262488	●
55	65,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24344722	○
55	70,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24131212	●
55	70,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / FKM	24245798	○
55	70,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	24178445	●
56	66,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24131183	●
56	66,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24223159	●
56	66,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24244976	●
56	71,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24101265	●
56	71,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / FKM	24265478	●
56	71,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	24178446	●
60	70,7	4	4,2	5,35	3,5	0,8	PTFE GM201 / NBR	24131184	○
60	70,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24223162	●
60	70,7	4	4,2	5,35	3,5	0,8	PTFE B602 / FKM	24250623	○
60	75,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24105984	●
60	75,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / FKM	24288710	○
60	75,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	24178447	●
63	78,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24131213	●
63	78,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	24190727	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	R ₁	Material	Article No.	
63	78,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / FKM	24245797	○
65	80,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24131214	●
65	80,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / FKM	24344723	○
65	80,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	24178449	●
70	85,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24110738	●
70	85,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	24178450	●
75	90,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24121487	●
75	90,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / FKM	24263440	○
75	90,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	24178451	●
80	90,7	4	4,2	5,35	3,5	0,8	PTFE B602 / NBR	24334161	○
80	95,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	24121483	●
80	95,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / FKM	24275322	●
85	100,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24110740	●
85	100,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24178453	●
85	100,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24329122	○
90	105,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24111803	●
90	105,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24178454	●
90	105,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24334402	●
95	110,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24213071	●
95	110,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24223698	○
100	115,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24131215	●
100	115,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24178455	●
100	115,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24314801	●
105	120,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24214072	●
105	120,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24302829	○
105	120,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24138660	○
110	125,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24119466	●
110	125,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24179236	●
110	125,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24301675	●
111,1	126,2	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24375984	○
115	130,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24131216	○
115	130,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24179237	●
115	130,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24344729	○
120	135,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24196902	●
120	135,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24214075	●
120	135,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24292144	●
125	140,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24179238	●
125	140,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24332957	●
125	140,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24131217	●
130	145,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24193747	○
130	145,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24298480	○
130	145,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24346876	●
140	155,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24179239	●
140	155,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24332958	●
140	155,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24131218	●
150	165,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24179240	●
150	165,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24265511	○
150	165,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24131219	●
160	175,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24179241	●
160	175,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24269037	●

● Available from stock ○ On request: Tool is available, delivery at short notice

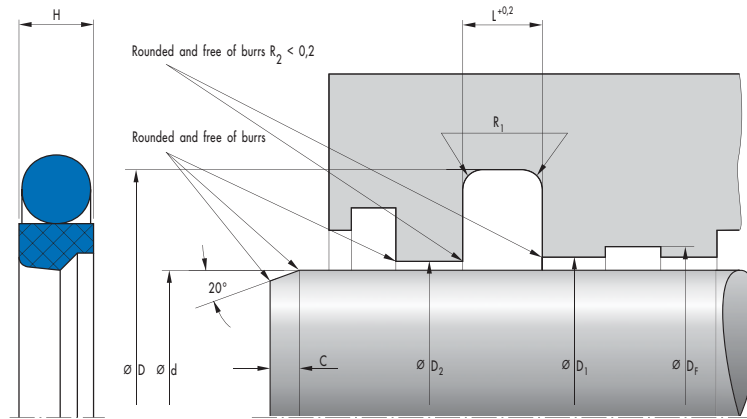


d	D	H	L	Profile	C	R ₁	Material	Article No.	
160	175,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24131220	○
170	185,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24214082	●
170	185,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24249007	●
170	185,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24133133	○
180	195,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24179242	●
180	195,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24316384	●
180	195,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24131221	●
190	205,1	5,9	6,3	7,55	6	1,2	PTFE GM201 / NBR	24216295	○
190	205,1	5,9	6,3	7,55	6	1,2	PTFE B602 / NBR	24223168	●
190	205,1	5,9	6,3	7,55	6	1,2	PTFE B602 / FKM	24348307	○
200	220,5	7,6	8,1	10,25	7,5	2	PTFE B602 / NBR	24179243	●
200	220,5	7,6	8,1	10,25	7,5	2	PTFE B602 / FKM	24258145	●
200	220,5	7,6	8,1	10,25	7,5	2	PTFE GM201 / NBR	24131222	●
210	230,5	7,6	8,1	10,25	7,5	2	PTFE GM201 / NBR	24121485	○
210	230,5	7,6	8,1	10,25	7,5	2	PTFE B602 / NBR	24223171	●
220	240,5	7,6	8,1	10,25	7,5	2	PTFE B602 / NBR	24214085	●
220	240,5	7,6	8,1	10,25	7,5	2	PTFE GM201 / NBR	24223690	○
220	240,5	7,6	8,1	10,25	7,5	2	PTFE B602 / FKM	24340955	●
225	245,5	7,6	8,1	10,25	7,5	2	PTFE GM201 / NBR	24275173	○
225	245,5	7,6	8,1	10,25	7,5	2	PTFE B602 / NBR	24335734	○
230	250,5	7,6	8,1	10,25	7,5	2	PTFE B602 / NBR	24223174	●
230	250,5	7,6	8,1	10,25	7,5	2	PTFE B602 / FKM	24352984	○
230	250,5	7,6	8,1	10,25	7,5	2	PTFE GM201 / NBR	24174789	○
240	260,5	7,6	8,1	10,25	7,5	2	PTFE GM201 / NBR	24105394	○
240	260,5	7,6	8,1	10,25	7,5	2	PTFE B602 / NBR	24223177	●
240	260,5	7,6	8,1	10,25	7,5	2	PTFE B602 / FKM	24344734	●
250	270,5	7,6	8,1	10,25	7,5	2	PTFE GM201 / NBR	24179920	○
250	270,5	7,6	8,1	10,25	7,5	2	PTFE B602 / NBR	24214087	●
250	270,5	7,6	8,1	10,25	7,5	2	PTFE B602 / FKM	24344735	○
260	284	7,6	8,1	12	8	2	PTFE B602 / NBR	24223180	●
260	284	7,6	8,1	12	8	2	PTFE GM201 / NBR	24223691	○
260	284	7,6	8,1	12	8	2	PTFE B602 / FKM	24258139	●
270	294	7,6	8,1	12	8	2	PTFE B602 / NBR	24223183	●
280	304	7,6	8,1	12	8	2	PTFE B602 / NBR	24214089	●
280	304	7,6	8,1	12	8	2	PTFE B602 / FKM	24344737	●
280	304	7,6	8,1	12	8	2	PTFE GM201 / NBR	24177957	○
290	314	7,6	8,1	12	8	2	PTFE B602 / NBR	24223186	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	R ₁	Material	Article No.	
300	324	7,6	8,1	12	8	2	PTFE GM201 / NBR	24213516	●
300	324	7,6	8,1	12	8	2	PTFE B602 / NBR	24214091	●
300	324	7,6	8,1	12	8	2	PTFE B602 / FKM	24344739	●
320	344	7,6	8,1	12	8	2	PTFE B602 / NBR	24214093	●
320	344	7,6	8,1	12	8	2	PTFE GM201 / NBR	24223694	○
320	344	7,6	8,1	12	8	2	PTFE B602 / FKM	24311132	○
330	354	7,6	8,1	12	8	2	PTFE B602 / NBR	24223192	●
340	364	7,6	8,1	12	8	2	PTFE B602 / NBR	24223195	●
340	364	7,6	8,1	12	8	2	PTFE GM201 / NBR	24223696	○
340	364	7,6	8,1	12	8	2	PTFE B602 / FKM	24344742	○
360	384	7,6	8,1	12	8	2	PTFE GM201 / NBR	24196617	○
360	384	7,6	8,1	12	8	2	PTFE B602 / NBR	24214095	●
360	384	7,6	8,1	12	8	2	PTFE B602 / FKM	24243374	●
380	404	7,6	8,1	12	8	2	PTFE B602 / NBR	24275731	●
380	404	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275871	○
390	414	7,6	8,1	12	8	2	PTFE B602 / NBR	24275745	○
390	414	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275912	○
400	424	7,6	8,1	12	8	2	PTFE B602 / NBR	24259183	●
400	424	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275913	○
410	434	7,6	8,1	12	8	2	PTFE B602 / NBR	24275730	●
410	434	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275910	○
410	434	7,6	8,1	12	8	2	PTFE B602 / FKM	24344748	○
420	444	7,6	8,1	12	8	2	PTFE B602 / NBR	24275718	●
420	444	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275882	○
420	444	7,6	8,1	12	8	2	PTFE B602 / FKM	24344749	○
430	454	7,6	8,1	12	8	2	PTFE B602 / NBR	24275744	●
430	454	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275870	○
430	454	7,6	8,1	12	8	2	PTFE B602 / FKM	24344750	○
435	459	7,6	8,1	12	8	2	PTFE GM201 / NBR	24308272	○
440	464	7,6	8,1	12	8	2	PTFE GM201 / NBR	24265249	○
440	464	7,6	8,1	12	8	2	PTFE B602 / NBR	24275751	●
440	464	7,6	8,1	12	8	2	PTFE B602 / FKM	24344751	○
450	474	7,6	8,1	12	8	2	PTFE B602 / FKM	24243371	○
450	474	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275900	○
450	474	7,6	8,1	12	8	2	PTFE B602 / NBR	24346723	○
460	484	7,6	8,1	12	8	2	PTFE B602 / NBR	24275729	●
460	484	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275909	○
460	484	7,6	8,1	12	8	2	PTFE B602 / FKM	24344752	○
470	494	7,6	8,1	12	8	2	PTFE B602 / NBR	24269646	○
470	494	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275881	○
470	494	7,6	8,1	12	8	2	PTFE B602 / FKM	24344753	○
480	504	7,6	8,1	12	8	2	PTFE B602 / NBR	24268686	●
480	504	7,6	8,1	12	8	2	PTFE GM201 / NBR	24268688	○
480	504	7,6	8,1	12	8	2	PTFE B602 / FKM	24344754	○
485	509	7,6	8,1	12	8	2	PTFE GM201 / NBR	24344483	○
485	509	7,6	8,1	12	8	2	PTFE B602 / NBR	24352001	○
490	514	7,6	8,1	12	8	2	PTFE B602 / NBR	24269412	○
490	514	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275869	○
490	514	7,6	8,1	12	8	2	PTFE B602 / FKM	24344755	○
495	519	7,6	8,1	12	8	2	PTFE B602 / NBR	24267645	○

● Available from stock ○ On request: Tool is available, delivery at short notice

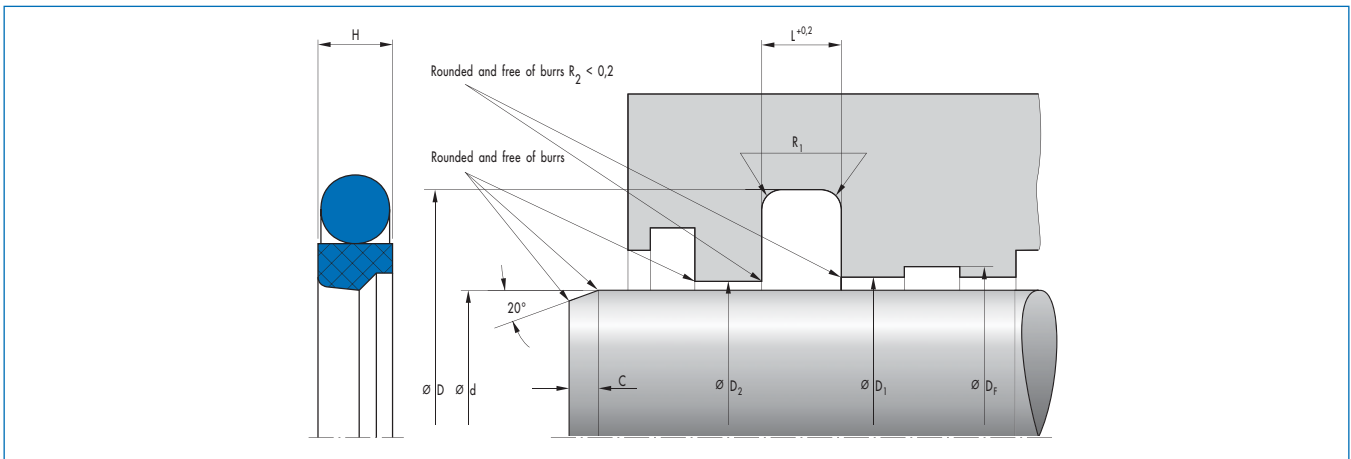


d	D	H	L	Profile	C	R ₁	Material	Article No.	
500	524	7,6	8,1	12	8	2	PTFE B602 / NBR	24264956	●
500	524	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275911	○
500	524	7,6	8,1	12	8	2	PTFE B602 / FKM	24357274	○
510	534	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275908	○
510	534	7,6	8,1	12	8	2	PTFE B602 / FKM	24344757	○
515	539	7,6	8,1	12	8	2	PTFE B602 / NBR	24339493	○
520	544	7,6	8,1	12	8	2	PTFE B602 / NBR	24275716	○
520	544	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275899	○
520	544	7,6	8,1	12	8	2	PTFE B602 / FKM	24344758	○
530	554	7,6	8,1	12	8	2	PTFE B602 / NBR	24275728	○
530	554	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275880	○
530	554	7,6	8,1	12	8	2	PTFE B602 / FKM	24344759	○
540	564	7,6	8,1	12	8	2	PTFE B602 / NBR	24261155	○
540	564	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275868	○
540	564	7,6	8,1	12	8	2	PTFE B602 / FKM	24344760	○
550	574	7,6	8,1	12	8	2	PTFE GM201 / NBR	24233563	○
550	574	7,6	8,1	12	8	2	PTFE B602 / NBR	24234533	●
550	574	7,6	8,1	12	8	2	PTFE B602 / FKM	24344761	○
555	579	7,6	8,1	12	8	2	PTFE B602 / NBR	24314953	○
560	584	7,6	8,1	12	8	2	PTFE GM201 / NBR	24243496	○
560	584	7,6	8,1	12	8	2	PTFE B602 / FKM	24263331	○
560	584	7,6	8,1	12	8	2	PTFE B602 / NBR	24275702	●
570	594	7,6	8,1	12	8	2	PTFE B602 / NBR	24275715	○
570	594	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275898	○
570	594	7,6	8,1	12	8	2	PTFE B602 / FKM	24344762	○
580	604	7,6	8,1	12	8	2	PTFE B602 / NBR	24275732	●
580	604	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275907	○
580	604	7,6	8,1	12	8	2	PTFE B602 / FKM	24344763	○
590	614	7,6	8,1	12	8	2	PTFE B602 / NBR	24275727	○
590	614	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275879	○
590	614	7,6	8,1	12	8	2	PTFE B602 / FKM	24344764	○
600	624	7,6	8,1	12	8	2	PTFE B602 / NBR	24275742	●
600	624	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275867	○
600	624	7,6	8,1	12	8	2	PTFE B602 / FKM	24344765	○
610	634	7,6	8,1	12	8	2	PTFE B602 / NBR	24275703	○
610	634	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275890	○
610	634	7,6	8,1	12	8	2	PTFE B602 / FKM	24344766	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	R ₁	Material	Article No.	
620	644	7,6	8,1	12	8	2	PTFE B602 / NBR	24275714	○
620	644	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275897	○
620	644	7,6	8,1	12	8	2	PTFE B602 / FKM	24344767	○
630	654	7,6	8,1	12	8	2	PTFE B602 / NBR	24268690	●
630	654	7,6	8,1	12	8	2	PTFE GM201 / NBR	24268692	○
630	654	7,6	8,1	12	8	2	PTFE B602 / FKM	24344768	○
640	664	7,6	8,1	12	8	2	PTFE B602 / NBR	24275726	●
640	664	7,6	8,1	12	8	2	PTFE GM201 / NBR	24275878	○
640	664	7,6	8,1	12	8	2	PTFE B602 / FKM	24344769	○
650	677,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275734	●
650	677,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275866	○
650	677,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344770	○
660	687,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275704	○
660	687,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275889	○
660	687,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344771	○
670	697,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275713	●
670	697,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275896	○
670	697,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344772	○
680	707,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24269482	○
680	707,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275906	○
680	707,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344773	○
690	717,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275725	○
690	717,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344774	○
690	717,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275877	○
700	727,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275741	○
700	727,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275865	○
700	727,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344775	○
710	737,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275705	○
710	737,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344776	○
720	747,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275712	○
720	747,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275895	○
720	747,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344777	○
730	757,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275724	●
730	757,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275905	○
730	757,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344778	○
735	762,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24350580	○
740	767,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275749	○
740	767,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275876	○
740	767,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344779	○
750	777,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275736	●
750	777,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275864	○
750	777,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344780	○
760	787,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275706	○
760	787,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275887	○
760	787,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344781	○
770	797,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275723	○
770	797,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275894	○
770	797,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344782	○
780	807,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275711	○
780	807,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344783	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	L	Profile	C	R ₁	Material	Article No.	
780	807,3	9,5	9,5	13,65	11	2	PTFE GM201 / NBR	24275904	○
790	817,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275748	○
790	817,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275875	○
790	817,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344784	○
795	822,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24344330	○
800	827,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275737	●
800	827,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275863	○
800	827,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344785	○
810	837,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275707	○
810	837,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275886	○
810	837,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344786	○
820	847,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275722	○
820	847,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275893	○
820	847,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344787	○
830	857,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275747	○
830	857,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275903	○
830	857,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344788	○
840	867,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275752	○
840	867,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275874	○
840	867,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344789	○
850	877,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275738	●
850	877,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275862	○
850	877,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344790	○
860	887,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275708	●
860	887,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275902	○
860	887,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344791	○
870	897,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275721	○
870	897,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275892	○
870	897,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344792	○
880	907,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275746	○
880	907,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275885	○
880	907,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344793	○
890	917,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275753	●
890	917,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275873	○
890	917,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344794	○
900	927,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275739	○
900	927,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275861	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	R ₁	Material	Article No.	
900	927,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344795	○
910	937,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275709	○
910	937,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275901	○
910	937,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344796	○
920	947,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275720	○
920	947,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275891	○
920	947,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344797	○
930	957,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	24275754	○
930	957,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275884	○
930	957,3	8,7	9,5	13,65	11	2	PTFE B602 / FKM	24344798	○
940	967,3	8,7	9,5	13,65	11	2	PTFE B670 / NBR	24275740	○
940	967,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275872	○
940	967,3	8,7	9,5	13,65	11	2	PTFE B670 / FKM	24344799	○
950	977,3	8,7	9,5	13,65	11	2	PTFE B670 / NBR	24275710	○
950	977,3	8,7	9,5	13,65	11	2	PTFE GM201 / NBR	24275860	○
950	977,3	8,7	9,5	13,65	11	2	PTFE B670 / FKM	24344800	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Omegat OMS-MR PR

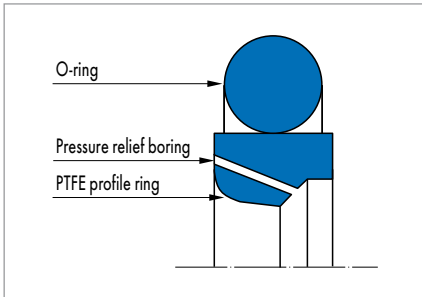


Fig. 1 Merkel Omegat OMS-MR PR

Product description

Two-component Merkel seal set for sealing piston rods, consisting of one PTFE profile ring with integrated pressure-relief function and an elastomer ring as pre-load component. Patented product design (patent no.: DE 10117662 CI).

Product advantages

- Can be exchanged with operating environments of the Merkel Omegat OMS-MR Series. Increased operating reliability of sealing systems with demanding operating parameters (no continuously pressure build-up in gap area)
- Extended service life of sealing systems by long-term stability (reduced loading of the sealing system by minimised friction and wear).

Application

- Primary seal in a sealing system - longer stroke (greater than 400 mm)
- High stroke speed when piston rod extends (greater than 0,5 m/s)
- High speed differences depending on the direction of movement (V out greater than 8xV in)
- Fast pressure drop in main area
- Large diameter (greater than 310 mm).

Injection moulding machines, mills, agricultural machinery, presses, earth moving equipment, large cylinders, industrial vehicles, cranes, control and regulation equipment, marine hydraulics.

Material

PTFE profile ring

Material	Code	Colour
PTFE bronze compound	PTFE B602	Brown
PTFE glass MoS ₂ compound	PTFE GM201	Grey
PTFE carbon fibre compound	PTFE C104	Dark grey

O-ring

Material	Code
Nitrile rubber	NBR

Other combinations of materials are available on enquiry.

Operating conditions

Material	PTFE B602/NBR	PTFE GM201/NBR PTFE C104/NBR
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +100
HFA fluids	-	+5 ... +60
HFB fluids	-	+5 ... +60
HFC fluids	-	-30 ... +60
HFD fluids	-	-
Water	-	+5 ... +100
HETG (rapeseed oil)	-30 ... +80	-30 ... +80
HEES (synthetic ester)	-30 ... +80	-30 ... +80
HEPG (glycol)	-30 ... +60	-30 ... +60
Mineral greases	-30 ... +100	-30 ... +100
Pressure p in MPa	40	
Running speed v in m/s	5	

The specified values are maximum values and must not be applied simultaneously.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Gap dimension

The dimension D2 is determined under load with reference to the maximum permissible extrusion gap, the tolerance levels, the guide play and the compressive deflection of the guide. → Technical Manual. The maximum permissible extrusion gap with one-sided position of the piston rod is primarily determined by the maximum operating pressure and the temperature-dependent form stability of the sealing material.

Profile		Max. permissible gap dimension			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
4,2	5,35	0,5	0,4	0,3	-
6,3	7,55	0,55	0,45	0,35	0,3
8,1	10,25	0,6	0,5	0,4	0,4
8,1	12	0,7	0,6	0,55	0,5
9,5	13,65	0,75	0,65	0,6	0,55
8,1	12	0,7	0,6	0,55	0,5
9,5	13,65	0,75	0,65	0,6	0,55

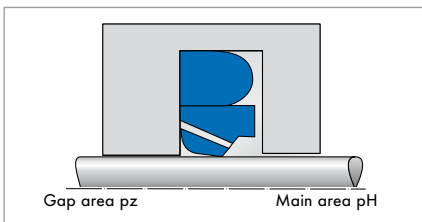
At an operating temperature above 90°C and simultaneously applied operating pressure above 26 MPa we recommend the use of the material compounds PTFE B602 and PTFE C104.

Mode of operation

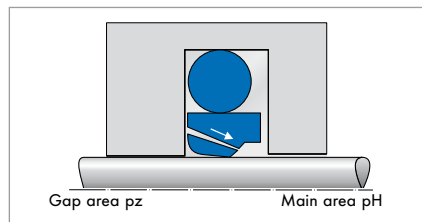
The Omegat OMS-MR PR has an integrated pressure-relief function. Once the gap pressure p_z is greater than the pressure in the main area p_H (e.g. caused by poor speed conditions during extension and retraction) the seal is reliably relieved. The sealing function of the Omegat OMS-MR PR is similar to the tried-and-trusted Omegat seals.

Position in the operating environment

$p_z < p_H$



Position in the operating environment during pressure relief

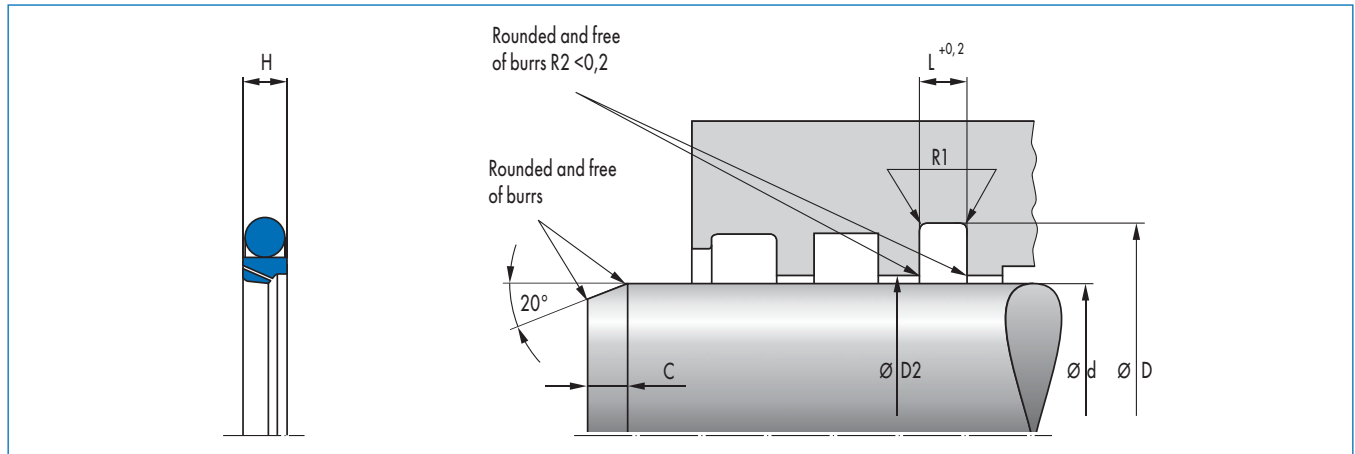


p_z = pressure in the gap area; p_H = pressure in the main area

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list

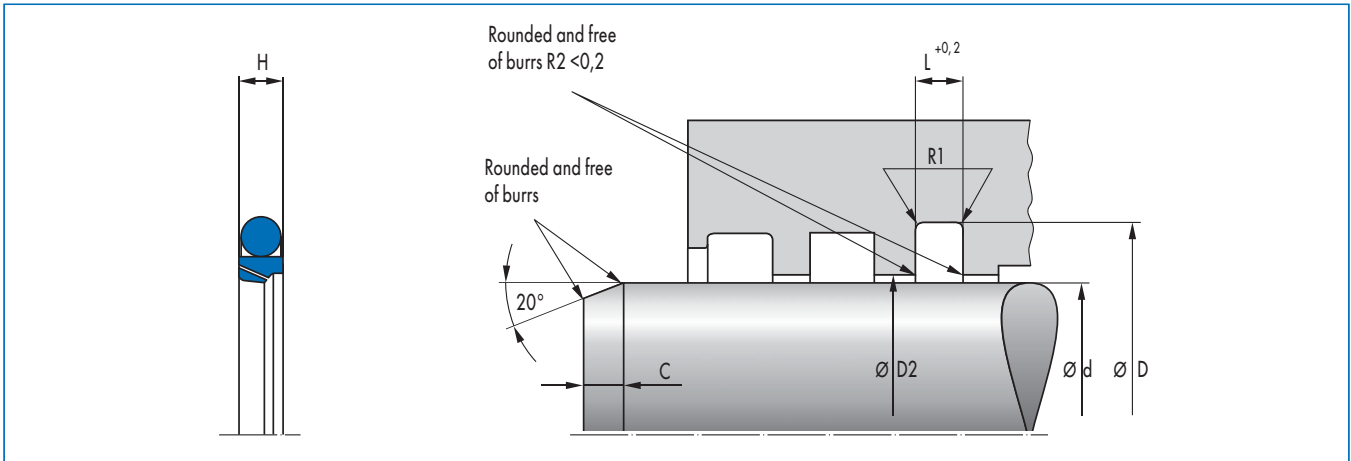


d	D	H	L	Profile	C	R ₁	Material	Article No.	
25	35,7	4	4,2	5,35	5,5	1,2	PTFE B602 / NBR	49015922	○
30	40,7	4	4,2	5,35	5,5	1,2	PTFE GM201 / NBR	49013958	○
32	42,7	4	4,2	5,35	5,5	1,2	PTFE B602 / NBR	49015921	○
36	46,7	4	4,2	5,35	5,5	1,2	PTFE B602 / NBR	49022316	○
40	50,7	4	4,2	5,35	5,5	1,2	PTFE B602 / NBR	49008897	○
40	55,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49030512	○
45	55,7	4	4,2	5,35	5,5	1,2	PTFE B602 / NBR	49005182	○
50	60,7	4	4,2	5,35	5,5	0,8	PTFE B602 / NBR	49009141	○
50	60,7	4	4,2	5,35	5,5	1,2	PTFE GM201 / NBR	49022785	○
50	65,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49004614	○
50	65,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49023489	○
50	65,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49029429	○
55	70,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49014635	○
55	70,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49019333	○
55	70,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49023488	○
56	71,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49002594	○
56	71,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49014916	○
56	71,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49018474	○
60	75,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49012253	○
60	75,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49039570	○
63	78,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49009142	○
63	78,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49014917	○
63	78,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49018475	○
65	80,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49002595	○
65	80,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49021364	○
68	83,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49024835	○
70	80,7	4	4,2	5,35	5,5	1,2	PTFE C104 / NBR	49011113	○
70	85,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49006087	○
70	85,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49008472	○
70	85,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49017738	○
73	88,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49039585	○
74	89,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49023807	○
75	90,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49002596	○
75	90,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49018476	○
75	90,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49022320	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	R ₁	Material	Article No.	
80	95,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49005181	○
80	95,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / FKM	49013961	○
80	95,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49016403	○
80	95,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49039522	○
85	100,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49002597	○
85	100,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49018477	○
85	100,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49018521	○
90	105,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49017739	○
90	105,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49027501	○
95	110,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49021365	○
100	115,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49015915	○
100	115,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49020572	○
100	115,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49021366	○
105	120,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49003864	○
105	120,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49015663	○
110	125,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49002598	○
110	125,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49012225	○
110	125,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49017740	○
115	130,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49018445	○
120	135,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49002599	○
120	135,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49012945	○
120	135,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49017277	○
125	140,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49010807	○
125	140,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / FKM	49013002	○
125	140,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49015916	○
125	140,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49017741	○
130	145,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49002600	○
130	145,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49012252	○
130	145,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49036920	○
135	150,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49018331	○
140	155,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49004553	○
140	155,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49015917	○
140	155,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49024657	○
145	160,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49017742	○
150	165,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49005153	○
150	165,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49016162	○
150	165,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49020172	○
155	170,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49018944	○
160	175,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49015918	○
160	175,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49017743	○
170	185,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49015207	○
170	185,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49018943	○
170	185,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49022317	○
175	190,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49035947	○
180	195,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / FKM	49012616	○
180	195,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49015919	○
180	195,1	5,9	6,3	7,55	5,5	1,2	PTFE C104 / NBR	49017744	○
180	195,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49023809	○
190	205,1	5,9	6,3	7,55	5,5	1,2	PTFE B602 / NBR	49018778	○
190	205,1	5,9	6,3	7,55	5,5	1,2	PTFE GM201 / NBR	49023810	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	L	Profile	C	R ₁	Material	Article No.	
200	220,5	7,6	8,1	10,25	8	2	PTFE GM201 / FKM	49013960	○
200	220,5	7,6	8,1	10,25	8	2	PTFE C104 / NBR	49017745	○
200	220,5	7,6	8,1	10,25	8	2	PTFE GM201 / NBR	49023811	○
200	220,5	7,6	8,1	10,25	8	2	PTFE B602 / NBR	49027562	○
210	230,5	7,6	8,1	10,25	8	2	PTFE C104 / NBR	49015913	○
210	230,5	7,6	8,1	10,25	8	2	PTFE GM201 / NBR	49023822	○
210	230,5	7,6	8,1	10,25	8	2	PTFE B602 / NBR	49027563	○
215	235,5	7,6	8,1	10,25	8	2	PTFE C104 / NBR	49023880	○
220	240,5	7,6	8,1	10,25	8	2	PTFE B602 / NBR	49012807	○
220	240,5	7,6	8,1	10,25	8	2	PTFE C104 / NBR	49017746	○
220	240,5	7,6	8,1	10,25	8	2	PTFE B604 / NBR	49036674	○
230	250,5	7,6	8,1	10,25	8	2	PTFE GM201 / NBR	49004615	○
230	250,5	7,6	8,1	10,25	8	2	PTFE B602 / NBR	49027564	○
240	260,5	7,6	8,1	10,25	8	2	PTFE B602 / NBR	49016866	○
240	260,5	7,6	8,1	10,25	8	2	PTFE C104 / NBR	49018772	○
250	270,5	7,6	8,1	10,25	8	2	PTFE GM201 / NBR	49009053	○
250	270,5	7,6	8,1	10,25	8	2	PTFE C104 / NBR	49017747	○
250	270,5	7,6	8,1	10,25	8	2	PTFE B602 / NBR	49030568	○
255	275,5	7,6	8,1	10,25	8	2	PTFE B602 / NBR	49015011	○
260	284	7,6	8,1	12	8	2	PTFE GM201 / FKM	49015687	○
260	284	7,6	8,1	12	8	2	PTFE B602 / NBR	49016862	○
260	284	7,6	8,1	12	8	2	PTFE C104 / NBR	49019084	○
265	289	7,6	8,1	12	8	2	PTFE C104 / NBR	49017636	○
270	294	7,6	8,1	12	8	2	PTFE B602 / NBR	49016776	○
280	304	7,6	8,1	12	8	2	PTFE C104 / NBR	49017748	○
280	304	7,6	8,1	12	8	2	PTFE B602 / NBR	49020179	○
285	309	7,6	8,1	12	8	2	PTFE B602 / NBR	49027565	○
290	314	7,6	8,1	6,5	8	2	PTFE B602 / NBR	49012804	○
295	319	7,6	8,1	12	8	2	PTFE C104 / NBR	49017637	○
295	319	7,6	8,1	12	8	2	PTFE B602 / NBR	49037793	○
300	324	7,6	8,1	12	8	2	PTFE B602 / NBR	49020994	○
310	334	7,6	8,1	12	8	2	PTFE C104 / NBR	49023881	○
320	344	7,6	8,1	12	8	2	PTFE B602 / NBR	49013550	○
320	344	7,6	8,1	12	8	2	PTFE C104 / NBR	49024658	○
330	354	7,6	8,1	12	8	2	PTFE GM201 / NBR	49004616	○
330	354	7,6	8,1	12	8	2	PTFE B602 / NBR	49012805	○
335	359	7,6	8,1	12	8	2	PTFE C104 / NBR	49017638	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	R ₁	Material	Article No.	
340	364	7,6	8,1	12	8	2	PTFE B602 / NBR	49013224	○
350	374	7,6	8,1	12	8	2	PTFE C104 / FKM	49013920	○
350	374	7,6	8,1	12	8	2	PTFE B602 / FKM	49018008	○
350	374	7,6	8,1	12	8	2	PTFE B602 / NBR	49036916	○
355	379	7,6	8,1	12	8	2	PTFE B602 / NBR	49017650	○
355	379	7,6	8,1	12	8	2	PTFE C104 / NBR	49017750	○
360	384	7,6	8,1	12	8	2	PTFE B602 / NBR	49014368	○
360	384	7,6	8,1	12	8	2	PTFE C104 / NBR	49024660	○
365	389	7,6	8,1	12	8	2	PTFE B602 / NBR	49037296	○
370	394	7,6	8,1	12	8	2	PTFE B602 / NBR	49020995	○
380	404	7,6	8,1	12	8	2	PTFE B602 / NBR	49012806	○
380	404	7,6	8,1	12	8	2	PTFE C104 / NBR	49017639	○
390	414	7,6	8,1	12	8	2	PTFE B602 / NBR	49027566	○
400	424	7,6	8,1	12	8	2	PTFE C104 / NBR	49017751	○
400	424	7,6	8,1	12	8	2	PTFE B602 / FKM	49020262	○
400	424	7,6	8,1	12	8	2	PTFE B602 / NBR	49027567	○
400	427,3	8,7	9,5	13,65	11	2	PTFE C104 / FKM	49019802	○
410	434	7,6	8,1	12	8	2	PTFE B602 / NBR	49007163	○
440	464	7,6	8,1	12	8	2	PTFE B602 / NBR	49019314	○
450	474	7,6	8,1	12	8	2	PTFE B602 / NBR	49027568	○
460	484	7,6	8,1	12	8	2	PTFE B602 / NBR	49014935	○
470	494	7,6	8,1	12	8	2	PTFE B602 / NBR	49014936	○
470	494	7,6	8,1	12	8	2	PTFE C104 / NBR	49017641	○
490	514	7,6	8,1	12	8	2	PTFE B602 / NBR	49037293	○
500	524	7,6	8,1	12	8	2	PTFE B602 / NBR	49015337	○
520	544	7,6	8,1	12	8	2	PTFE B602 / NBR	49014937	○
530	554	7,6	8,1	12	8	2	PTFE B602 / NBR	49014247	○
530	554	7,6	8,1	12	8	2	PTFE GM201 / NBR	49033643	○
540	564	7,6	8,1	12	8	2	PTFE B602 / NBR	49034165	○
560	584	7,6	8,1	12	8	2	PTFE B602 / NBR	49033893	○
590	614	7,6	8,1	12	8	2	PTFE C104 / NBR	49020078	○
600	624	7,6	8,1	12	8	2	PTFE B602 / NBR	49016703	○
630	654	7,6	8,1	12	8	2	PTFE C104 / NBR	49023709	○
670	697,3	8,7	9,5	13,65	11	2	PTFE C104 / NBR	49017644	○
730	757,3	8,7	9,5	13,65	11	2	PTFE C104 / NBR	49018768	○
750	777,3	8,7	9,5	13,65	11	2	PTFE C104 / NBR	49017645	○
750	777,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	49020530	○
760	787,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	49039345	○
800	827,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	49003492	○
870	908	12,9	13,8	19	15	2	PTFE C104 / NBR	49018775	○
900	927,3	8,7	9,5	13,65	11	2	PTFE B602 / NBR	49032920	○
1120	1158	12,9	13,8	19	15	2	PTFE C104 / NBR	49017760	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Omegat OMS-S

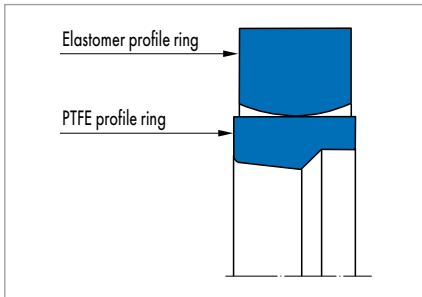


Fig. 1 Merkel Omegat OMS-S

Product description

Two-piece Merkel seal set for sealing piston rods, consisting of a profile ring with an elastomer profile ring as a pre-load component.

Product advantages

Merkel Omegat OMS-S is designed especially for larger diameters and heavy duty hydraulic applications

- Very high resistance to pressure
- Very good extrusion resistance
- Design prevents twisting
- High contact pressure due to elastomer profile ring
- High resistance to abrasion
- Low friction, free of stick-slip.

Application

Injection moulding machines, steel hydraulics engineering, marine hydraulics, mills, presses, manipulators, large cylinders.

Material

PTFE profile ring

Material	Code
PTFE glass MoS ₂ compound	PTFE GM201

Elastomer profile ring

Material	Code	Hardness
Nitrile rubber NBR	80 NBR B246	80 Shore A

Operating conditions

Material	PTFE GM201/NBR
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +100
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	40
Running speed v in m/s	5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_v >50% up to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal → Technical Manual. The permissible value is determined by the pressure as well as the profile width and profile height.

Profile		Max. permissible gap dimension			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
10	10	0,75	0,5	0,4	0,4
12,5	12,5	0,75	0,65	0,55	0,5
15	15	0,75	0,65	0,55	0,5
17,5	17,5	0,75	0,65	0,55	0,5
20	20	0,8	0,7	0,6	0,55

Tolerance recommendation and dimension D2

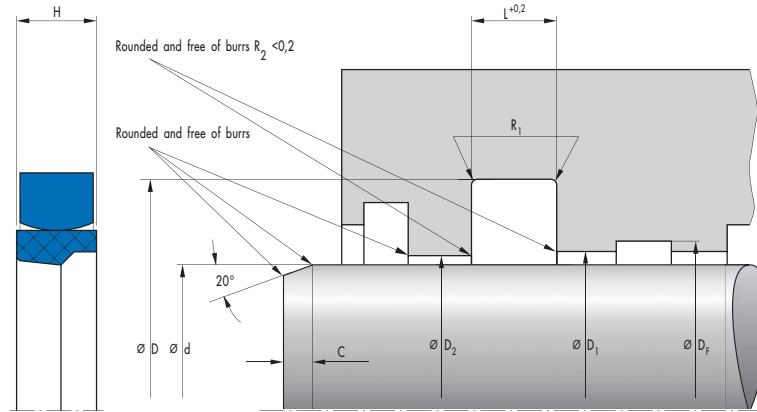
The admissible gap width, tolerances, guide play and compressive deflection of the guide under load must be considered in the design of D2. → Technical Manual.

Nominal Ø d	16 MPa		26 MPa		32 MPa		40 MPa	
	d	D	d	D	d	D	d	D
50 ... 200	f8	H8	f8	H8	f7	H8	f7	H8
>200 ... 300	f8	H8	f8	H8	f8	H8	f8	H8
>300 ... 530	f8	H8	f8	H8	f8	H8	f7	H8
>530 ... 1150	f8	H8	f8	H8	f7	H8	f8	H8

Fitting & installation

When fitting the Omegat OMS-S the elastomer profile ring is first placed in the housing groove, then the profile ring is deformed to a kidney shape and sprung into place. During this process it is to be ensured no sharp kinks are produced in the PTFE profile ring and that the sealing edge is correctly arranged in relation to the direction of the pressure. The entire fitting operation is only allowed to be performed over rounded edges.

Article list

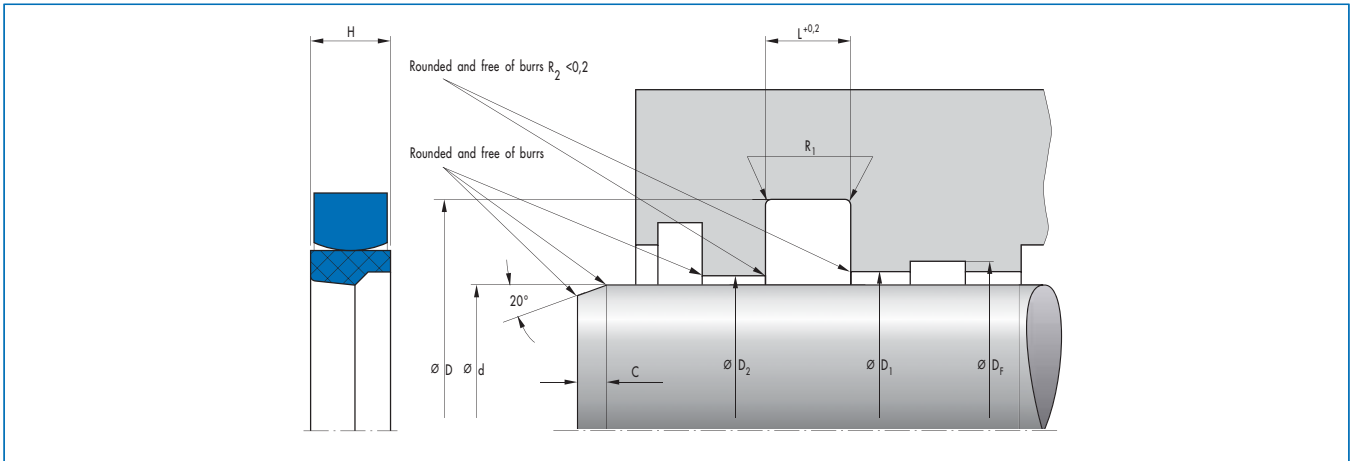


d	D	H	L	Profile	C	R ₁	Material	Article No.	
20	30	4,7	5	5	4	0,4	PTFE GM201	24096118	○
25	35	4,7	5	5	4	0,4	PTFE GM201	24096120	○
30	40	4,7	5	5	4	0,4	PTFE GM201	24096122	○
35	45	4,7	5	5	4	0,4	PTFE GM201	24096124	○
36	46	4,7	5	5	4	0,4	PTFE GM201	24096125	○
40	55	7	7,5	7,5	5,5	0,4	PTFE GM201	24096126	○
45	60	7	7,5	7,5	5,5	0,4	PTFE GM201	24096128	○
50	65	7	7,5	7,5	7,5	0,3	PTFE GM201	24096129	●
56	71	7	7,5	7,5	5,5	0,4	PTFE GM201	24096131	○
60	75	7	7,5	7,5	7,5	0,3	PTFE GM201	24096132	●
63	78	7	7,5	7,5	5,5	0,4	PTFE GM201	24096133	○
65	80	7	7,5	7,5	7,5	0,3	PTFE GM201	24096134	○
70	85	7,5	10	7,5	7,5	0,3	PTFE GM201	24096135	●
75	95	9,4	10	10	7,5	0,4	PTFE GM201	24096136	○
80	100	9,4	10	10	7,5	0,4	PTFE GM201	24096137	○
85	105	9,4	10	10	7,5	0,4	PTFE GM201	24096138	○
90	110	9,4	10	10	7,5	0,4	PTFE GM201	24096139	○
100	120	9,4	10	10	7,5	0,4	PTFE GM201	24096140	●
105	125	9,4	10	10	7,5	0,4	PTFE GM201	24239117	○
110	130	9,4	10	10	7,5	0,4	PTFE GM201	24096141	○
113,3	133,3	9,4	10	10	7,5	0,4	PTFE GM201	24214297	○
115	135	9,4	10	10	7,5	0,4	PTFE GM201	24096142	○
120	140	9,4	10	10	7,5	0,4	PTFE GM201	24182344	○
125	145	9,4	10	10	7,5	0,4	PTFE GM202	24096143	○
130	150	9,4	10	10	7,5	0,4	PTFE GM201	24124096	○
140	160	9,4	10	10	7,5	0,4	PTFE GM201	24096144	○
145	165	9,4	10	10	7,5	0,4	PTFE B602	49008072	○
145	165	9,4	10	10	7,5	0,4	PTFE B604	49033900	○
145	165	9,4	10	10	7,5	0,4	PTFE GM201	24138538	○
150	170	9,4	10	10	7,5	0,4	PTFE GM201	24096145	●
158	178	9,4	10	10	7,5	0,4	PTFE GM201	24234939	○
160	180	9,4	10	10	7,5	0,4	PTFE B602	24375281	○
160	180	9,4	10	10	7,5	0,4	PTFE GM201	24096146	●
165	185	9,4	10	10	7,5	0,4	PTFE GM201	49039714	○
170	190	9,4	10	10	7,5	0,4	PTFE GM201	24106817	○
175	195	9,4	10	10	7,5	0,4	PTFE GM201	24187339	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	R ₁	Material	Article No.	
180	200	9,4	10	10	7,5	0,4	PTFE GM201	24096147	●
180	200	9,4	10	10	7,5	0,4	PTFE GM201	24367094	○
200	220	9,4	10	10	7,5	0,4	PTFE B602	24352639	○
200	220	9,4	10	10	7,5	0,4	PTFE GM201	24096148	●
210	235	11,7	12,5	12,5	10	0,4	PTFE GM201	24374728	○
220	245	11,7	12,5	12,5	10	0,4	PTFE B602	24378030	○
220	245	11,7	12,5	12,5	10	0,4	PTFE GM201	24147048	○
221,4	246,4	11,7	12,5	12,5	10	0,4	PTFE GM201	24234931	○
230	255	11,7	12,5	12,5	10	0,4	PTFE GM201	24224744	○
237,2	262,2	11,7	12,5	12,5	10	0,4	PTFE GM201	24186690	○
240	265	11,7	12,5	12,5	10	0,4	PTFE GM201	24224748	●
247,7	272,7	11,7	12,5	12,5	10	0,4	PTFE GM201	24247181	○
250	275	11,7	12,5	12,5	10	0,4	PTFE B602	24301162	○
250	275	11,7	12,5	12,5	10	0,4	PTFE GM201	24195054	○
260	285	11,7	12,5	12,5	10	0,4	PTFE B602	24371158	○
260	285	11,7	12,5	12,5	10	0,4	PTFE GM201	24177004	○
265	290	11,7	12,5	12,5	10	0,4	PTFE B602	24234339	○
270	295	11,7	12,5	12,5	10	0,4	PTFE GM201	24224737	○
270	300	14	15	15	10	0,4	PTFE GM201	24132488	○
280	305	11,7	12,5	12,5	10	0,4	PTFE GM201	24192379	●
290	315	11,7	12,5	12,5	10	0,4	PTFE GM201	24195056	○
300	325	11,7	12,5	12,5	10	0,4	PTFE GM201	24208689	●
310	340	14	15	15	12	0,8	PTFE GM201	24194530	○
315	345	14	15	15	12	0,8	PTFE GM201	24250718	○
320	350	14	15	15	12	0,8	PTFE B602	24338624	○
320	350	14	15	15	12	0,8	PTFE GM201	24209894	●
325	355	14	15	15	12	0,8	PTFE GM201	24294165	○
330	360	14	15	15	12	0,8	PTFE GM201	24141409	●
335	365	14	15	15	12	0,8	PTFE GM201	531547	○
340	370	14	15	15	12	0,8	PTFE GM201	24224735	○
350	380	14	15	15	12	0,8	PTFE B602	24338027	○
350	380	14	15	15	12	0,8	PTFE GM201	24214029	○
360	390	14	15	15	12	0,8	PTFE B602	24338662	○
360	390	14	15	15	12	0,8	PTFE GM201	24224746	●
370	400	14	15	15	12	0,8	PTFE GM201	24224751	○
380	410	15	15	15	12	0,8	PTFE GM201	24182881	●
390	420	14	15	15	12	0,8	PTFE GM201	24224739	○
400	430	14	15	15	12	0,8	PTFE B602	24379065	○
400	430	14	15	15	12	0,8	PTFE GM201	24183343	●
410	440	14	15	15	12	0,8	PTFE GM201	24197943	○
420	450	14	15	15	12	0,8	PTFE GM201	24224742	○
430	460	14	15	15	12	0,8	PTFE GM201	24224749	○
435	465	14	15	15	12	0,8	PTFE GM201	526056	○
440	470	14	15	15	12	0,8	PTFE GM201	24193472	●
445	475	14	15	15	12	0,8	PTFE GM201	49008473	○
450	480	14	15	15	12	0,8	PTFE GM201	24177002	○
460	490	14	15	15	12	0,8	PTFE B602	24373024	○
460	490	14	15	15	12	0,8	PTFE GM201	24224740	●
470	500	14	15	15	12	0,8	PTFE B602	24342901	○
470	500	14	15	15	12	0,8	PTFE GM201	24137929	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	L	Profile	C	R ₁	Material	Article No.	
480	510	14	15	15	12	0,8	PTFE B602	24338028	○
480	510	14	15	15	12	0,8	PTFE GM201	24193226	○
490	520	14	15	15	12	0,8	PTFE GM201	24224738	○
500	530	15	15	15	12	0,8	PTFE GM201	24135188	○
510	545	16,4	17,5	17,5	12	0,8	PTFE GM201	24199480	○
520	555	16,4	17,5	17,5	12	1,2	PTFE B602	24349777	○
520	555	16,4	17,5	17,5	12	0,8	PTFE GM201	24198653	○
525	565	18,7	20	20	12	1,2	PTFE B602	49002965	○
530	560	14	15	15	12	0,8	PTFE B602	24334997	○
530	560	15	15	15	12	0,8	PTFE GM201	24181189	○
540	575	16,4	17,5	17,5	12	0,8	PTFE GM201	24224759	●
545	580	16,4	17,5	17,5	12	0,8	PTFE GM201	49001641	○
550	585	16,4	17,5	17,5	12	1,2	PTFE B602	24362481	○
550	585	16,4	17,5	17,5	12	1,2	PTFE GM201	24191359	●
560	595	16,4	17,5	17,5	12	1,2	PTFE B602	24349743	○
560	595	16,4	17,5	17,5	12	1,2	PTFE GM201	24224747	○
570	605	16,4	17,5	17,5	12	1,2	PTFE GM201	24224756	○
580	615	16,4	17,5	17,5	12	1,2	PTFE GM201	24224760	○
590	625	16,4	17,5	17,5	12	1,2	PTFE B602	24342902	○
590	625	16,4	17,5	17,5	12	1,2	PTFE GM201	24224753	○
600	635	16,4	17,5	17,5	12	1,2	PTFE B602	24299660	○
600	635	16,4	17,5	17,5	12	1,2	PTFE GM201	24224745	○
605	640	16,4	17,5	17,5	12	1,2	PTFE GM201	24377267	○
620	655	16,4	17,5	17,5	12	1,2	PTFE GM201	24186170	○
630	665	16,4	17,5	17,5	12	1,2	PTFE GM201	24356724	○
640	675	16,4	17,5	17,5	12	1,2	PTFE GM201	24226250	○
650	685	16,4	17,5	17,5	12	1,2	PTFE GM201	24224750	●
660	695	16,4	17,5	17,5	12	1,2	PTFE GM201	24377265	○
670	705	16,4	17,5	17,5	12	1,2	PTFE B602	24367550	○
670	705	16,4	17,5	17,5	12	1,2	PTFE GM201	24224741	○
680	715	16,4	17,5	17,5	12	1,2	PTFE GM201	24238543	○
690	725	16,4	17,5	17,5	12	1,2	PTFE B602	24347090	○
690	725	16,4	17,5	17,5	12	1,2	PTFE GM201	528031	○
700	740	18,7	20	20	12	1,2	PTFE B602	24338738	○
700	740	18,7	20	20	12	1,2	PTFE GM201	24191357	○
720	760	18,7	20	20	12	1,2	PTFE GM201	24224754	○
730	770	18,7	20	20	12	1,2	PTFE GM201	24263626	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	R ₁	Material	Article No.	
740	780	18,7	20	20	12	1,2	PTFE GM201	24224763	○
750	790	18,7	20	20	12	1,2	PTFE GM201	24236499	○
755	795	18,7	20	20	12	1,2	PTFE GM201	24377266	○
760	800	18,7	20	20	12	1,2	PTFE GM201	24224765	○
770	810	18,7	20	20	12	1,2	PTFE GM201	24357244	○
790	830	18,7	20	20	12	1,2	PTFE GM201	49015688	○
800	840	18,7	20	20	12	1,2	PTFE GM201	24224758	●
810	850	18,7	20	20	12	1,2	PTFE GM201	24370506	○
820	860	18,7	20	20	12	1,2	PTFE GM201	24224762	●
830	870	18,7	20	20	12	1,2	PTFE GM201	24344383	○
850	890	18,7	20	20	12	1,2	PTFE GM201	24215728	●
860	900	18,7	20	20	12	1,2	PTFE GM201	24224755	○
890	930	18,7	20	20	12	1,2	PTFE GM201	24264039	○
900	940	18,7	20	20	12	1,2	PTFE B602	24348199	○
900	940	18,7	20	20	12	1,2	PTFE GM201	24224764	○
920	960	18,7	20	20	12	1,2	PTFE GM201	49008662	○
935	975	18,7	20	20	12	1,2	PTFE B602	49002966	○
950	990	18,7	20	20	12	1,2	PTFE B602	49011622	○
950	990	18,7	20	20	12	1,2	PTFE GM201	24261553	○
950	990	18,7	20	20	12	1,2	PTFE GM201	24262250	○
970	1010	18,7	20	20	12	1,2	PTFE GM270	24359666	○
1000	1040	18,7	20	20	12	1,2	PTFE B602	527858	○
1000	1040	18,7	20	20	12	1,2	PTFE GM201	24224757	○
1070	1110	18,7	20	20	12	1,2	PTFE B602	49020485	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Omegat OMS-S PR

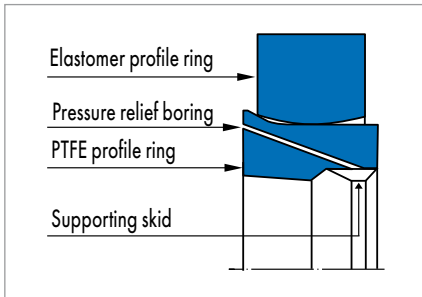


Fig. 1 Merkel Omegat OMS-S PR

Product description

Two-component Merkel seal set for sealing piston rods, consisting of one PTFE profile ring with integrated pressure-relief function and skid with an elastomer profile ring as pre-load component. Patented product design (patent no.: DE 10117662 Cl).

Product advantages

- Replaceable for operating environments of the Merkel Omegat OMS-S series
- Increased reliability of sealing systems under demanding operating parameters (no continuous pressure build-up in gap area)
- Extended service life of sealing systems by long-term stability (reduced loading of the sealing system by minimised friction and wear).

Application

- Primary seal in one sealing system
 - Long stroke (>400 mm)
 - High stroke speed when piston rod extends (>0,5 m/s)
 - High speed differences depending on the direction of movement ($v_{out} > 8 \times v_{in}$)
 - Fast pressure drop in main area
 - Large diameter (>310 mm).
- Injection moulding machines, mills, earth moving equipment, presses, steel hydraulics engineering, large cylinders.

Material

PTFE profile ring

Material	Code	Colour
PTFE bronze compound	PTFE B602	Brown
PTFE glass MoS ₂ compound	PTFE GM201	Grey
PTFE carbon fibre compound	PTFE C104	Dark grey

Elastomer profile ring

Material	Code
Nitrile rubber	NBR

Other materials are available on enquiry.

Operating conditions

Material	PTFE B602/NBR	PTFE GM201/NBR PTFE C104/NBR
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +100
HFA fluids	-	+5 ... +60
HFB fluids	-	+5 ... +60
HFC fluids	-	-30 ... +60
HFD fluids	-	-
Water	-	+5 ... +100
HETG (rapeseed oil)	-30 ... +80	-30 ... +80
HEES (synthetic ester)	-30 ... +80	-30 ... +80
HEPG (glycol)	-30 ... +60	-30 ... +60
Mineral greases	-30 ... +100	-30 ... +100
Pressure p in MPa	40	
Running speed v in m/s	5	

The specified values are maximum values and must not be applied simultaneously.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Surface quality

The long-term behaviour of the sealed component as well as the security against early failures are primarily determined by the quality of the counter-acting surface. This means that the surface must be precisely described and evaluated. Based on current knowledge we recommend supplementing the above

definition of the surface quality of the sliding surface with the quantities in the following table. The previous general description of the material component is significantly improved with the new quantities from the material component, particularly with reference to the abrasiveness of the surface.
→ Technical Manual.

Design notes

Please observe our general design notes in → Technical Manual.

Sliding surfaces

Characteristic value	Limit position
R_a	>0,05 mm ... 0,30 mm
R_{max}	<2,50 mm
R_{pkx}	<0,50 mm
R_{pk}	<0,50 mm
R_k	>0,25 mm ... 0,70 mm
R_{vk}	>0,20 mm ... 0,65 mm
R_{vkk}	>0,20 mm ... 2,00 mm

The limit values listed in the table are not currently applicable for ceramic or partial ceramic counter-surfaces.

Tolerances

D
H7

Gap dimension

Dimension D2 is determined with reference to the maximum permissible extrusion clearance, tolerances, guide play and compressive deflection of the guide under load.

Profile		Max. permissible gap dimension			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
12,5	12,5	0,75	0,65	0,55	0,50
15,0	15,0	0,75	0,65	0,55	0,50
17,5	17,5	0,75	0,65	0,55	0,50
20,0	20,0	0,80	0,70	0,60	0,55

At an operating temperature above 90°C and simultaneously applied operating pressure above 26 MPa we recom-

→ Technical Manual. The maximum permissible extrusion gap with single position of the piston rod is primarily determined by the maximum operating pressure and the temperature-dependent form stability of the sealing material.

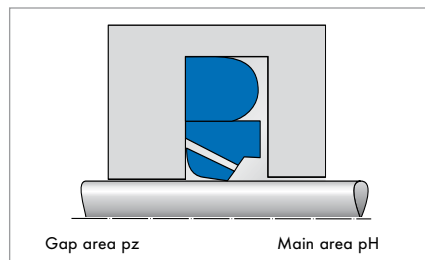
mend the use of the material compounds PTFE B602 and PTFE C104.

Mode of operation

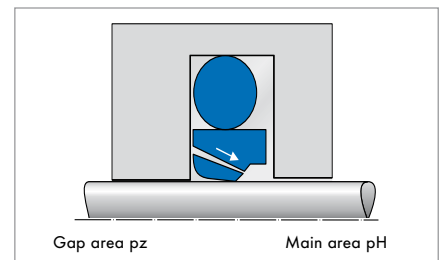
The Omegat OMS-S PR has a defined pressure-relief function. Once the gap

pressure p_z becomes greater than the pressure in the main area p_H the seal reliably relieves the seal.

Position in operating environment $p_z < p_H$



Position in operating environment during pressure relief

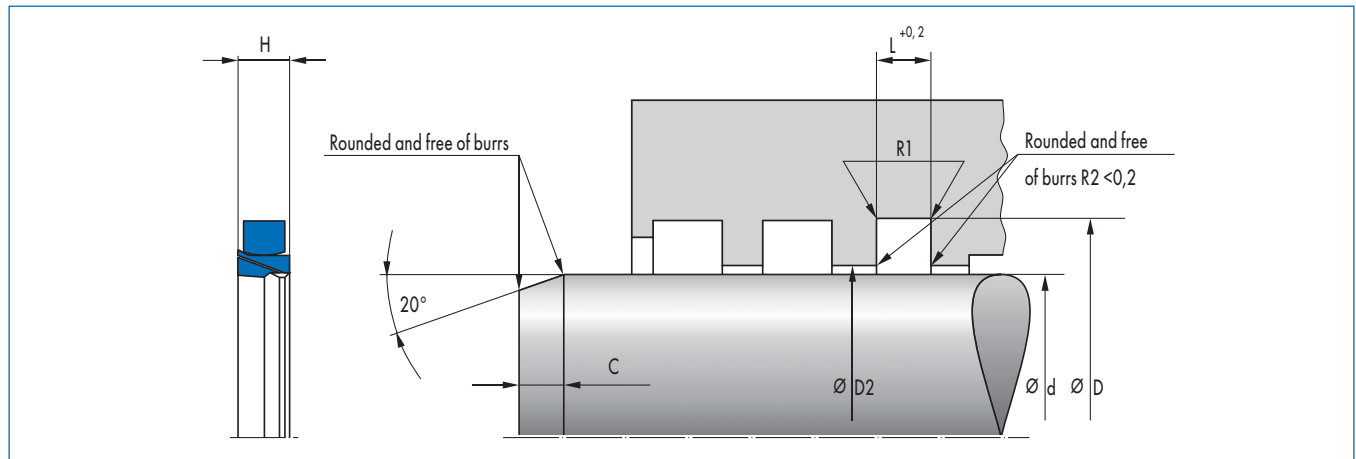


p_z = pressure in gap area; p_H = pressure in main area

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



d	D	H	L	Profile	C	R ₁	Material	Article No.	
80	100	9,4	10	10	7,5	0,4	PTFE GM201	49016726	○
100	120	9,4	10	10	7,5	0,4	PTFE B602	531594	○
120	140	9,4	10	10	7,5	0,4	PTFE B602	49001459	○
125	145	9,4	10	10	7,5	0,4	PTFE GM201	49013193	○
140	160	9,4	10	10	7,5	0,4	PTFE B602	532876	○
150	170	9,4	10	10	7,5	0,4	PTFE B602	529349	○
153	173	9,4	10	10	7,5	0,4	PTFE B602	49018309	○
160	180	9,4	10	10	7,5	0,4	PTFE B602	24376115	○
180	200	9,4	10	10	7,5	0,4	PTFE B602	24376116	○
180	200	9,4	10	10	7,5	0,4	PTFE GM201	532693	○
180	200	9,4	10	10	7,5	0,4	PTFE GM201	49012624	○
190	210	9,4	10	10	7,5	0,4	PTFE GM201	49003726	○
200	220	9,4	10	10	7,5	0,4	PTFE B602	531597	○
200	220	9,4	10	10	7,5	0,4	PTFE GM201	49013967	○
240	265	11,7	12,5	12,5	10	0,4	PTFE GM201	533361	○
250	275	11,7	12,5	12,5	10	0,4	PTFE GM201	49004521	○
260	285	11,7	12,5	12,5	10	0,4	PTFE GM201	49002343	○
260	285	11,7	12,5	12,5	10	0,4	PTFE GM201	49016727	○
280	305	11,7	12,5	12,5	10	0,4	PTFE GM201	49017440	○
290	315	11,7	12,5	12,5	10	0,4	PTFE GM201	49031374	○
300	325	11,7	12,5	12,5	10	0,4	PTFE B602	49018104	○
300	325	11,7	12,5	12,5	10	0,4	PTFE GM201	49030569	○
320	350	14	15	15	12	0,8	PTFE GM201	49003542	○
340	370	14	15	15	12	0,8	PTFE GM201	530525	○
350	380	14	15	15	12	0,8	PTFE B602	49038827	○
360	390	14	15	15	12	0,8	PTFE GM201	49035736	○
380	410	14	15	15	12	0,8	PTFE B602	49027736	○
380	410	14	15	15	12	0,8	PTFE GM201	49027663	○
400	430	14	15	15	12	0,8	PTFE GM201	49017441	○
410	440	14	15	15	12	0,8	PTFE GM201	49045104	○
420	450	14	15	15	12	0,8	PTFE B602	49021387	○
420	450	14	15	15	12	0,8	PTFE GM201	49010869	○
440	470	14	15	15	12	0,8	PTFE B602	49038828	○
450	480	14	15	15	12	0,8	PTFE GM201	49017442	○
490	520	14	15	15	12	0,8	PTFE GM201	49022435	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	R ₁	Material	Article No.	
500	530	14	15	15	12	0,8	PTFE GM201	49008121	○
510	545	16,4	17,5	17,5	12	1,2	PTFE B602	49038862	○
530	565	16,4	17,5	17,5	12	1,2	PTFE GM201	49026032	○
540	575	16,4	17,5	17,5	12	1,2	PTFE GM201	49030424	○
570	605	16,4	17,5	17,5	12	1,2	PTFE GM201	49017443	○
580	615	16,4	17,5	17,5	12	1,2	PTFE GM201	49015661	○
620	655	16,4	17,5	17,5	12	1,2	PTFE GM201	49014784	○
630	665	16,4	17,5	17,5	12	1,2	PTFE GM201	49017444	○
680	715	16,4	17,5	17,5	12	1,2	PTFE GM201	49026183	○
710	750	18,7	20	20	12	1,2	PTFE GM201	49017446	○
720	760	18,7	20	20	12	1,2	PTFE GM201	49004522	○
730	770	18,7	20	20	12	1,2	PTFE GM201	49015650	○
780	820	18,7	20	20	12	1,2	PTFE GM201	49032356	○
790	830	18,7	20	20	12	1,2	PTFE GM201	49015649	○
800	840	18,7	20	20	12	1,2	PTFE GM201	49015797	○
830	870	18,7	20	20	12	1,2	PTFE GM201	49003543	○
900	940	18,7	20	20	12	1,2	PTFE GM201	49006257	○
920	960	18,7	20	20	12	1,2	PTFE GM201	49011973	○
940	980	18,7	20	20	12	1,2	PTFE GM201	49022200	○
1000	1040	18,7	20	20	12	1,2	PTFE GM201	49017447	○
1250	1290	18,7	20	20	12	1,2	PTFE GM201	49010934	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal KI 310

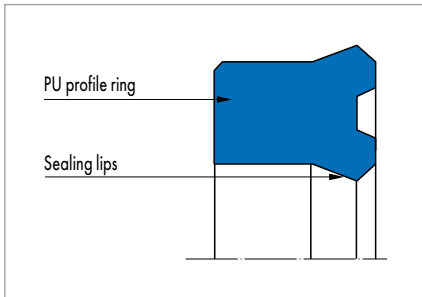


Fig. 1 Merkel Compact Seal KI 310

Product description

Merkel compact seal with asymmetrical profile and press fit at the outside diameter.

Product advantages

Single-acting rod seal for standardised housings, amongst others, according to ISO 5597

- Very good static and dynamic tightness
- Compact compression, higher surface roughness in the groove base is permitted
- Designed for radially restricted housings.

Application

Earth moving equipment, industrial vehicles, agricultural machinery, cranes, injection moulding machines, telescopic cylinders, steering cylinders, loading platforms.

Material

Material	Code	Hardness
Polyurethane	94 AU 925	94 Shore A

Operating conditions

Material	94 AU 925
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +40
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +40
Mineral greases	-30 ... +110
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤2 µm	≤10,0 µm
Groove flanks	≤3 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile	Max. permissible gap dimension			
	16 MPa	26 MPa	32 MPa	40 MPa
≤4,0	0,45	0,35	0,30	0,25
>4,0 ... 6,0	0,50	0,40	0,35	0,30

Tolerance recommendation and dimension D2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

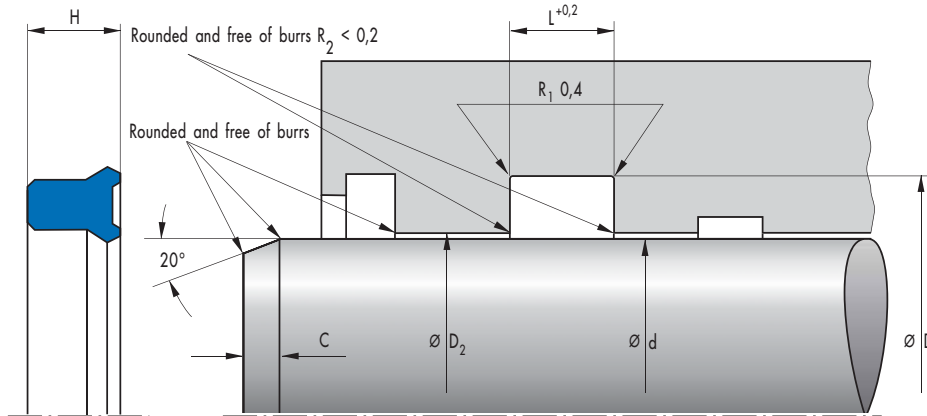
Nominal Ø d	d	D
0 ... 145	f8	H11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
10	18	5,5	6,3	4	3,5		ISO	94 AU P00925	401992	●
12	20	5,5	6,3	4	3,5		ISO	94 AU P00925	401994	●
14	22	5,5	6,3	4	3,5		ISO	94 AU P00925	401997	●
16	24	6	7	4	3,5			94 AU P00925	325753	●
18	25	5	5,8	3,5	3			94 AU P00925	327022	●
18	26	6	7	4	3,5			94 AU P00925	325755	●
20	26	5	5,8	3	3	W		94 AU P00925	310005	●
20	28	6	7	4	3,5	W		94 AU P00925	325756	●
22	28	4,5	5,3	3	3	W		94 AU P00925	310004	●
22	29	5	5,8	3,5	3	W		94 AU P00925	332052	●
22	30	6	7	4	3,5	W		94 AU P00925	325917	●
22	30	7	8	4	3,5	W	ISO	94 AU P00925	310003	●
22	32	8	9	5	4			94 AU P00925	326246	●
24	30	8	9	3	3	W		94 AU P00925	326245	○
24	32	6	7	4	3,5	W		94 AU P00925	310002	●
25	33	6	7	4	3,5	W		94 AU P00925	325918	●
25	33	8	9	4	3,5	W		94 AU P00925	310001	●
28	36	6	7	4	3,5	W		94 AU P00925	326252	●
28	36	8	9	4	3,5	W		94 AU P00925	326244	●
30	38	6	7	4	3,5	W		94 AU P00925	325919	●
30	38	8	9	4	3,5	W		94 AU P00925	310000	●
32	40	6	7	4	3,5	W		94 AU P00925	326253	●
32	40	8	9	4	3,5	W		94 AU P00925	326239	●
32	42	8	9	5	4	W		94 AU P00925	311592	●
35	43	6	7	4	3,5	W		94 AU P00925	309999	●
36	44	6	7	4	3,5	W		94 AU P00925	325920	●
36	44	8	9	4	3,5	W		94 AU P00925	326241	●
38	45	6	7	3,5	3	H		94 AU P00925	326242	●
40	48	6	7	4	3,5	H		94 AU P00925	325921	●
40	48	8	9	4	3,5	H		94 AU P00925	309998	●
42	50	6	7	4	3,5	H		94 AU P00925	325757	●
45	53	8	9	4	3,5	H		94 AU P00925	309997	●
45	55	7	8	5	4	W	ISO	94 AU P00925	331369	●
47	55	8	9	4	3,5	H		94 AU P00925	326243	○
50	58	8	9	4	3,5	H		94 AU P00925	309996	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
50	60	7	8	5	4	H	ISO	94 AU P00925	326519	●
52	60	5,5	6,3	4	3,5	H		94 AU P00925	366034	○
55	63	8	9	4	3,5	H		94 AU P00925	309995	●
55	65	7,5	8,5	5	4	H		94 AU P00925	325922	●
55	65	10	11	5	4	H		94 AU P00925	326238	●
55	65	12	13	5	4	H		94 AU P00925	349885	●
60	68	8	9	4	3,5	H		94 AU P00925	310022	●
60	68	13	14	4	3,5	H		94 AU P00925	323085	●
60	70	7,5	8,5	5	4	H		94 AU P00925	326236	●
63	71	8	9	4	3,5	H		94 AU P00925	325758	●
64	72	8	9	4	3,5	H		94 AU P00925	326233	○
65	73	8	9	4	3,5	H		94 AU P00925	326232	●
65	73	11,5	12,5	4	3,5	H		94 AU P00925	310024	○
65	75	12	13	5	4	H		94 AU P00925	326231	●
65	77	9	10	6	5	H		94 AU P00925	325759	●
70	78	8	9	4	3,5	H		94 AU P00925	325923	●
70	82	9	10	6	5	H		94 AU P00925	325760	●
71	79	8	9	4	3,5	H		94 AU P00925	310023	○
73	80	8	9	3,5	3	H		94 AU P00925	326249	○
75	83	8	9	4	3,5	H		94 AU P00925	326584	●
75	87	9	10	6	5	H		94 AU P00925	325761	●
78	86	8	9	4	3,5	H		94 AU P00925	310025	●
80	88	8	9	4	3,5	H		94 AU P00925	325924	●
80	90	10	11	5	4	H		94 AU P00925	349890	●
80	92	9	10	6	5	H		94 AU P00925	325762	●
81	89	8	9	4	3,5	H		94 AU P00925	310026	●
85	93	6,5	7,5	4	3,5	H		94 AU P00925	329399	○
85	94	15	16	4,5	3,5	H		94 AU P00925	326251	○
85	97	9	10	6	5	H		94 AU P00925	325763	○
87	95	8	9	4	3,5	H		94 AU P00925	310027	●
90	98	8	9	4	3,5	H		94 AU P00925	325764	●
90	102	9	10	6	5	H		94 AU P00925	325765	●
97	105	8	9	4	3,5	H		94 AU P00925	310028	●
97	105	13	14	4	3,5	H		94 AU P00925	326228	○
100	108	8	9	4	3,5	H		94 AU P00925	325766	●
103	111	10	11	4	3,5	H		94 AU P00925	326226	○
105	113	6,5	7,5	4	3,5	H		94 AU P00925	329397	○
107	115	8	9	4	3,5	H		94 AU P00925	353716	○
115	124	15	16	4,5	3,5	H		94 AU P00925	310030	●
118	126	13	14	4	3,5	H		94 AU P00925	323088	○
125	133	6,5	7,5	4	3,5	H		94 AU P00925	329398	○
143	151	13	14	4	3,5	H		94 AU P00925	323089	○
145	153	6,5	7,5	4	3,5	H		94 AU P00925	329396	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal KI 320

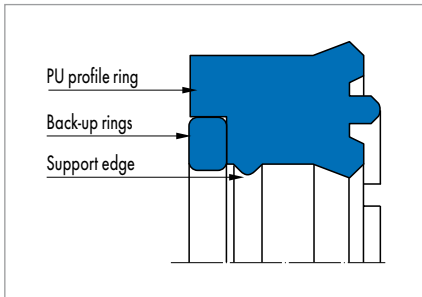


Fig. 1 Merkel Compact Seal KI 320

Product description

Merkel compact seal with integrated back-up ring, additional support edge and sealing edge, components for axial fixing in the housing and press fit at the outside diameter.

Product advantages

Single-acting rod seal for heavy duty applications, dimensions for standardised housings, amongst others, according to ISO 5597

- Very good static and dynamic tightness
- High pressures and larger gap widths permissible
- Compact compression, higher surface roughness in the groove base possible
- Additional sealing edge prevents ingress of dirt to a large degree
- Low deformation value, use in combination with single-acting wipers recommended.

Application

Earth moving equipment, cranes, telescopic cylinders, support cylinders, presses.

Material

Sealing ring

Material	Code	Hardness
Polyurethane	94 AU 925	94 Shore A

Back-up ring

Material	Code
Polyacetal	POM 992020

Operating conditions

Material	94 AU 925
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +40
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic ester)	-30 ... +60
HEPG (glycol)	-30 ... +40
Mineral greases	-30 ... +110
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤2 µm	≤10,0 µm
Groove flanks	≤3 µm	≤15,0 µm

Percentage contact area M_v >50% up to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

Profile	Max. permissible gap dimension			
	26 MPa	32 MPa	40 MPa	50 MPa
≤80	0,60	0,535	0,45	0,35
>80	0,65	0,600	0,60	0,40

Tolerance recommendation and dimension D2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

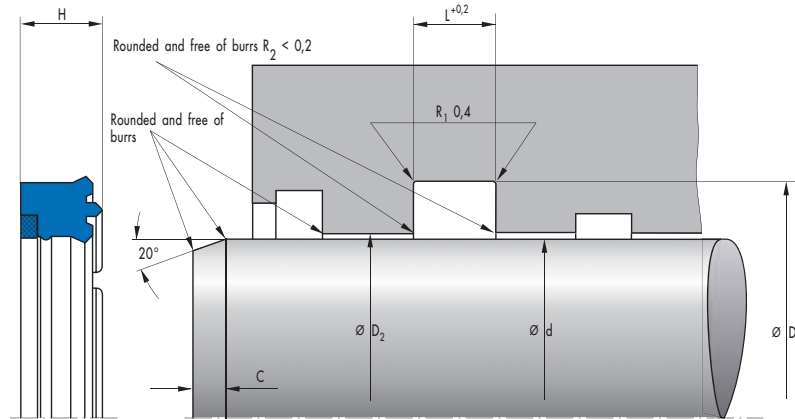
Nominal Ø d	d	D
40 ... 140	f8	H11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



d	D	H	L	Profile	C	Fitting	Housing	Material	Article No.	
40	50	8	8	5	4,5	W	ISO	94 AU P00925	351889	○
45	55	8	8	5	4,5	W	ISO	94 AU P00925	351890	●
50	65	12,5	12,5	7,5	5,5	W	ISO	94 AU P00925	351892	●
56	71	12,5	12,5	7,5	5,5	W	ISO	94 AU P00925	351893	●
63	78	12,5	12,5	7,5	5,5	W	ISO	94 AU P00925	351894	●
65	80	13	13	7,5	5,5	W		94 AU P00925	351895	○
70	85	12,5	12,5	7,5	5,5	W	ISO	94 AU P00925	351896	●
75	90	13	13	7,5	5,5	W		94 AU P00925	351897	●
80	95	12,5	12,5	7,5	5,5	H	ISO	94 AU P00925	351898	●
85	100	13	13	7,5	5,5	H		94 AU P00925	351899	●
95	110	13	13	7,5	5,5	H		94 AU P00925	351900	●
100	120	16	16	10	6	W	ISO	94 AU P00925	351901	●
110	130	16	16	10	6	W	ISO	94 AU P00925	351902	●
115	130	13	13	7,5	5,5	H		94 AU P00925	354245	○
120	135	16	16	7,5	5,5	H		94 AU P00925	351903	○
125	145	16	16	10	6	H	ISO	94 AU P00925	351904	●
140	160	16	16	10	6	H	ISO	94 AU P00925	351905	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal S 8

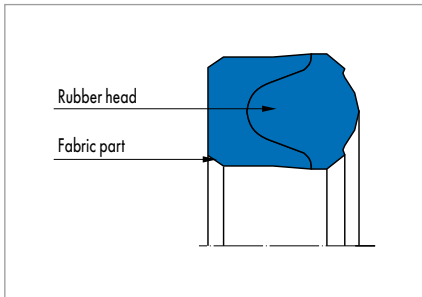


Fig. 1 Merkel Compact Seal S 8

Product description

Single-piece rod seal with a rubber head set in the fabric part.

Product advantages

Compact rod seal, also for standardised housings according to ISO 5597

- Easy to fit
- Excellent sealing effect also in the lower pressure range
- Low friction due to the fabric part.

Application

Standard cylinders, telescopic cylinders, machine tools, spindle seals.

Material

Material	Code	Hardness
Nitrile rubber NBR	70 NBR B209	70 Shore A

Operating conditions

Material	70 NBR B209
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +100
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	25
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual. In the case of larger gap dimensions than specified in the table full-surface back-up ring of plastic should be used behind the seal.

Profile	Max. permissible gap dimension	
	16 MPa	25 MPa
≤6	0,2	0,1
>6 ... 10	0,2	0,1
>10 ... 15	0,2	0,1

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

Nominal Ø d	d	D
≤80	f8	H11
>80 ... 120	f8	H11
>120 ... 340	f7	H11

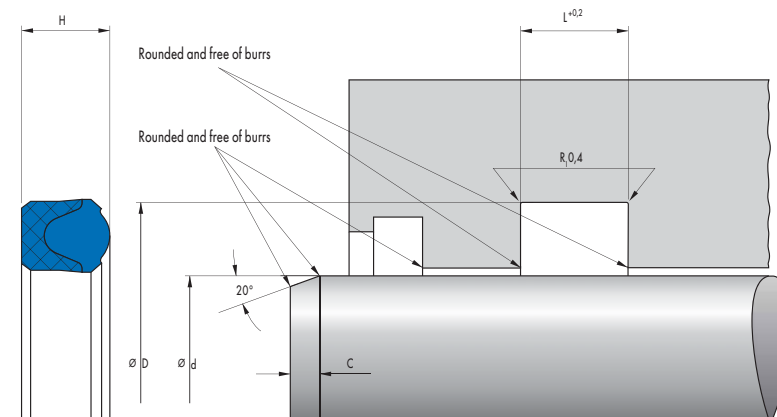
Fit example for metal guides

Nominal Ø d	d	D
≤80	H9/f8	H11
>80 ... 120	H8/f8	H11
>120 ... 340	H8/f7	H11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

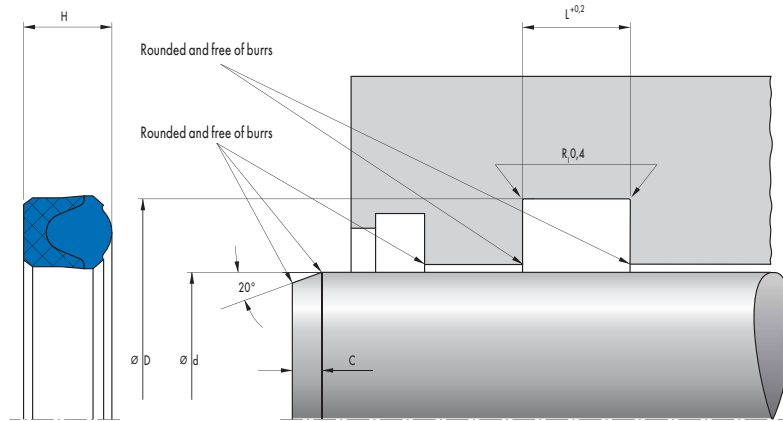
Article list



d	D	H	L	Profile	C	Housing	Fitting	Material	Article No.	
5	12	6	6,3	3,5	2,5		H	70 NBR B209	24030115	●
6	13	6	6,3	3,5	2,5			70 NBR B209	24027634	●
8	15	6	6,3	3,5	2,5			70 NBR B209	24007352	●
10	17	6	6,3	3,5	2,5			70 NBR B209	24007358	●
12	19	6	6,3	3,5	2,5			70 NBR B209	24007364	●
14	22	6	6,3	4	2,5	ISO	H	70 NBR B209	24027629	●
15	23	6	6,3	4	2,5			70 NBR B209	24007372	●
16	24	6	6,3	4	2,5	ISO	H	70 NBR B209	24027652	●
18	25	6	6,3	4	2,5		H	70 NBR B209	24030522	●
18	26	6	6,3	4	2,5	ISO		70 NBR B209	24007379	●
20	28	6	6,3	4	2,5	ISO		70 NBR B209	24007388	●
22	30	6	6,3	4	2,5	ISO		70 NBR B209	24007397	●
24	32	6	6,3	4	2,5		H	70 NBR B209	24027651	●
25	32	6	6,3	3,5	2,5			70 NBR B209	24060408	●
25	33	6	6,3	4	2,5	ISO		70 NBR B209	24007407	●
25	35	7	7,5	5	3		H	70 NBR B209	24055606	●
28	36	6	6,3	4	2,5		W	70 NBR B209	24007413	●
30	38	6	6,3	4	2,5			70 NBR B209	24027648	●
30	38	8	8,5	4	2,5			70 NBR B209	24027626	●
32	40	6	6,3	4	2,5		H	70 NBR B209	24023604	●
35	43	6	6,3	4	2,5		H	70 NBR B209	24027649	●
35	45	7,5	8	5	3		W	70 NBR B209	24007446	●
36	44	6	6,3	4	2,5		W	70 NBR B209	24007448	●
40	48	6	6,3	4	2,5		W	70 NBR B209	24007461	●
40	48	8	8,5	4	2,5		W	70 NBR B209	24073042	●
40	48	11	11,7	4	2,5		W	70 NBR B209	24007465	○
40	50	7,5	8	5	3	ISO	W	70 NBR B209	24007467	●
40	52	9	9,5	6	3		W	70 NBR B209	24030126	●
42	50	6	6,3	4	2,5		H	70 NBR B209	24007475	●
44	55	10	10,6	5,5	3		W	70 NBR B209	24094781	●
45	53	8	8,5	4	2,5		H	70 NBR B209	24060410	●
45	55	7,5	8	5	3	ISO	W	70 NBR B209	24007485	●
48	60	10	10,6	6	3		H	70 NBR B209	24055751	○
50	58	8	8,5	4	2,5		H	70 NBR B209	24117303	●
50	60	7,5	8	5	3	ISO	H	70 NBR B209	24007494	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing



d	D	H	L	Profile	C	Housing	Fitting	Material	Article No.	
50	60	10	10,6	5	3		H	70 NBR B209	24135436	●
50	62	9	9,5	6	3		W	70 NBR B209	24091914	●
55	65	7,5	8	5	3		H	70 NBR B209	24027658	●
55	67	10	10,6	6	3		W	70 NBR B209	24007510	●
56	66	7,5	8	5	3	ISO	H	70 NBR B209	24007513	●
60	70	7,5	8	5	3		H	70 NBR B209	24007520	●
63	75	9	9,5	6	3		H	70 NBR B209	24007539	●
65	75	7,5	8	5	3		H	70 NBR B209	24142200	●
65	77	9	9,5	6	3		H	70 NBR B209	24007545	●
70	80	7	7,5	5	3		H	70 NBR B209	24084356	●
70	82	9	9,5	6	3		H	70 NBR B209	24007555	●
70	85	11,5	12,2	7,5	5	ISO	W	70 NBR B209	24007558	●
75	87	9	9,5	6	3		H	70 NBR B209	24007567	●
78	90	12	12,5	6	3		H	70 NBR B209	24068016	●
80	92	9	9,5	6	3		H	70 NBR B209	24027655	●
80	95	12	12,5	7,5	5	ISO	H	70 NBR B209	24143115	○
85	97	9	9,5	6	3		H	70 NBR B209	24007587	●
85	100	11,3	12	7,5	5		H	70 NBR B209	24007590	●
90	102	9	9,5	6	3		H	70 NBR B209	24007602	●
90	105	11,3	12	7,5	5	ISO	H	70 NBR B209	24007605	●
95	107	12	12,5	6	3		H	70 NBR B209	24070580	●
100	110	7,5	8	5	3		H	70 NBR B209	24176851	●
100	115	11,3	12	7,5	5		H	70 NBR B209	24027657	●
105	120	11,5	12,2	7,5	5		H	70 NBR B209	24007629	●
110	125	11,3	12	7,5	5		H	70 NBR B209	24027631	●
115	130	11,3	12	7,5	5		W	70 NBR B209	24007645	●
120	135	11,3	12	7,5	5		H	70 NBR B209	24084364	●
125	140	11,3	12	7,5	5		H	70 NBR B209	24027653	●
130	142	9	9,5	6	3		H	70 NBR B209	24007661	●
130	145	10,2	11	7,5	5		H	70 NBR B209	24031801	●
135	150	10	11	7,5	5		H	70 NBR B209	24027636	●
140	155	13	14	7,5	5		H	70 NBR B209	24057871	○
140	160	15	16	10	5	ISO	H	70 NBR B209	24007671	●
150	170	15	16	10	5		H	70 NBR B209	24007682	●
155	175	15	16	10	5		H	70 NBR B209	24007685	●
160	180	15	16	10	5		H	70 NBR B209	24027656	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

d	D	H	L	Profile	C	Housing	Fitting	Material	Article No.	
165	185	15	16	10	5		H	70 NBR B209	24007694	●
170	190	15	16	10	5		H	70 NBR B209	24091141	●
180	200	15	16	10	5		H	70 NBR B209	24007703	●
180	205	18,8	20	12,5	5	ISO	H	70 NBR B209	24120564	○
200	220	15	16	10	5		H	70 NBR B209	24007710	●
210	230	16	17	10	5		H	70 NBR B209	24065708	●
220	240	15	16	10	5		H	70 NBR B209	24139773	●
225	240	15	16	7,5	5		H	70 NBR B209	24100164	○
240	260	15	16	10	5			70 NBR B209	24091143	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel Compact Seal TFMI

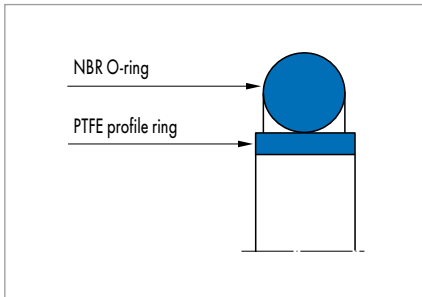


Fig. 1 Merkel Compact Seal TFMI

Product description

Two-piece Merkel compact seal consisting of profile ring and O-ring as a pre-load component.

Product advantages

Rod seal for lower pressure range with properties of

- Low friction
- Low housing height.

Material

Profile ring

Material	Code
PTFE bronze compound	PTFE 177023

O-ring

Material	Code
Nitrile rubber NBR	70 Shore A

Operating conditions

Material	PTFE 177023/NBR
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	-
HFB fluids	-
HFC fluids	-
HFD fluids	-
Water	-
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic ester)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	16
Running speed v in m/s	2

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

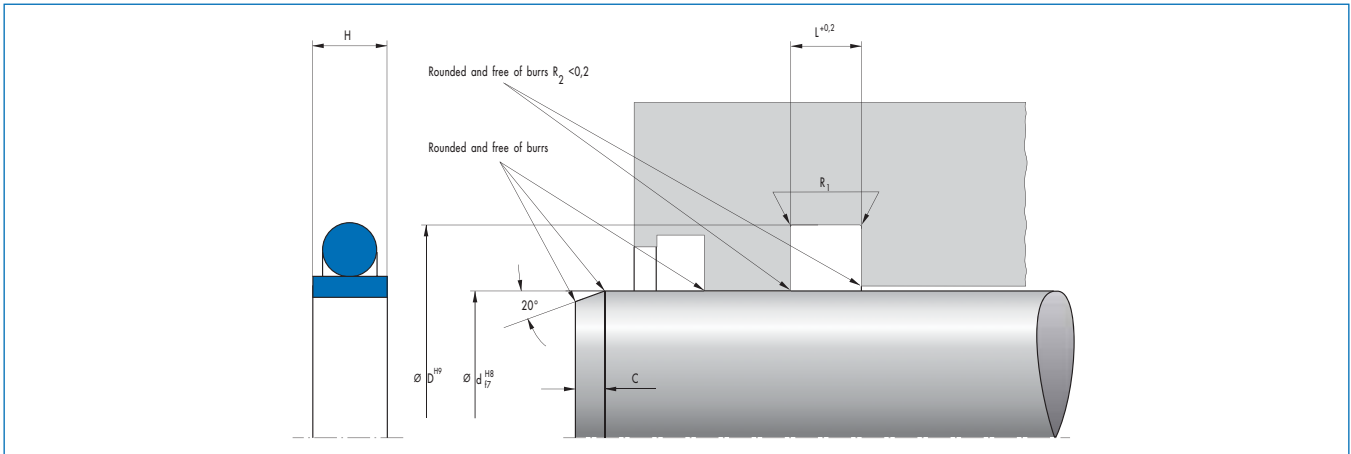
Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual. We recommend a metal guide H8/f7.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal. → Technical Manual.

Article list



d	D	H	L	C	R ₁	Material	Article No.	
10	16,2	3	3,2	2,5	0,4	PTFE 177023	97013	●
12	18,2	3	3,2	3	0,4	PTFE 177023	96638	●
14	20,2	3	3,2	3	0,4	PTFE 177023	97880	●
15	21,2	3	3,2	3	0,4	PTFE 177023	97014	●
16	22,2	3	3,2	3	0,4	PTFE 177023	97881	●
18	24,2	3	3,2	3	0,4	PTFE 177023	97525	○
20	26,2	3	3,2	3	0,4	PTFE 177023	97250	●
22	28,2	3	3,2	3	0,4	PTFE 177023	97388	●
25	32,2	3,8	4	3,5	0,5	PTFE 177023	97016	●
28	35,2	3,8	4	3,5	0,5	PTFE 177023	94138	●
30	37,2	3,8	4	3,5	0,5	PTFE 177023	97017	●
32	39,2	3,8	4	3,5	0,5	PTFE 177023	97879	●
35	42,2	3,8	4	3,5	0,5	PTFE 177023	97018	●
36	43,2	3,8	4	3,5	0,5	PTFE 177023	96706	○
38	45,2	3,8	4	3,5	0,5	PTFE 177023	96303	○
40	47,2	3,8	4	3,5	0,5	PTFE 177023	97019	●
42	49,2	3,8	4	3,5	0,5	PTFE 177023	98323	○
45	52,2	3,8	4	3,5	0,5	PTFE 177023	97020	○
50	57,2	3,8	4	3,5	0,5	PTFE 177023	97021	●
55	62,2	3,8	4	3,5	0,5	PTFE 177023	98541	●
56	63,2	3,8	4	3,5	0,5	PTFE 177023	96707	○
60	72,2	7,3	7,5	7,5	0,8	PTFE 177023	98375	●
63	75,2	7,3	7,5	7,5	0,8	PTFE 177023	38664	○
65	77,2	7,3	7,5	7,5	0,8	PTFE 177023	98772	○
70	82,2	7,3	7,5	7,5	0,8	PTFE 177023	98377	○
75	87,2	7,3	7,5	7,5	0,8	PTFE 177023	98773	○
80	92,2	7,3	7,5	7,5	0,8	PTFE 177023	98724	○
85	97,2	7,3	7,5	7,5	0,8	PTFE 177023	98774	○
90	102,2	7,3	7,5	7,5	0,8	PTFE 177023	98775	○
95	107,2	7,3	7,5	7,5	0,8	PTFE 177023	98058	○
100	112,2	7,3	7,5	7,5	0,8	PTFE TF6404	99066	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Chevron Seal Set ES, ESV

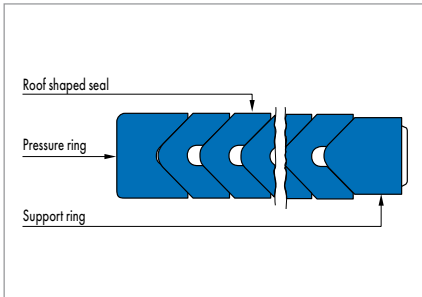


Fig. 1 Merkel Chevron Seal Set ES, ESV

Product description

Multi-component Merkel seal set for sealing piston rods, consisting of a pressure ring, at least 3 seals and a back-up ring. The Merkel Chevron Seal Sets are available in 3 different designs.

Type A has 3 to 5 fabric roof-shaped seals and can be installed in adjustable or non-adjustable sealing areas.

Type B has 3 to 5 fabric roof-shaped seals, one rubber-sprung back-up ring and is installed in non-adjustable sealing areas. Constant axial pre-load.

Type C has 2 to 4 fabric roof-shaped seals, one rubber seal and can be installed in adjustable and non-adjustable sealing areas. For an enhanced sealing effect. Type A and Type B can be supplied in open form. Type C is always delivered in endless form.

Product advantages

Seal set for robust operating conditions, mainly for provision of spare parts to old plant

- Proven under extreme conditions
- Long service life
- Can be optimally adjusted to the related application
- Functions over a certain time period even with poorer surfaces
- For application and design-related reasons fluctuations in the leakage behaviour and friction behaviour are to be expected.

Application

Injection moulding machines, presses, marine hydraulics, scrap cutters, iron and steel industry, special cylinders, steel hydraulics, engineering.

Material

Pressure ring

Material	Code
Cotton fabric/NBR	BI-NBR B259
Cotton fabric/FKM	BI-FKM

Rubber fabric roof-shaped seal

Material	Code
Cotton fabric/NBR	BI-NBR
Cotton fabric/FKM	BI-FKM

Rubber seal

Material	Code	
NBR	85 NBR	85 Shore A
FKM	85 FKM (ESV)	85 Shore A

Back-up ring

Material	Code
Cotton fabric/NBR	BI-NBR
Cotton fabric/FKM	BI-FKM
Polyacetal POM	POM

Operating conditions

Material	BI-NBR / 85 NBR	BI-FKM / 85 FKM
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-15 ... +140
HFA fluids	+5 ... +60	+5 ... +60
HFB fluids	+5 ... +60	+5 ... +60
HFC fluids	-30 ... +60	-15 ... +60
HFD fluids	-	-15 ... +140
Water	+5 ... +100	+5 ... +80
HETG (rapeseed oil)	-30 ... +80	-15 ... +80
HEES (synthetic ester)	-30 ... +80	-15 ... +100
HEPG (glycol)	-30 ... +60	-15 ... +80

Material	BI-NBR / 85 NBR	BI-FKM /85 FKM
Temperature range in °C		
Mineral greases	-30 ... +100	-15 ... +140
Pressure p in MPa	40	
Running speed v in m/s	0,5	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_v >50% up to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

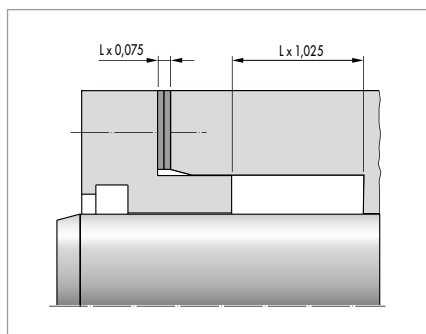
Nominal Ø d	d
≤80	H9/f8
>80 ... 120	H8/f8
>120 ... 500	H8/f7
> 500 ... 630	H8/f7
> 630 ... 800	H8/f7
> 800 ... 1000	H8/f7
>1000 ... 1250	H8/f7

Nominal Ø d	d
≤500	H11
>500	H10

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal. Before installation all individual parts of the seal set must be greased. Mineral-oil-based greases can be used so long as they have a good seal-compatibility. The rod must be in the cylinder's installation space before installation. Merkel Chevron Seal Sets can also be built-in in an open form. This has the advantage that in the event of a repair and replacement of the seal set, e.g. in a large system, it does not require a large amount of work for installation. The sealing rings are installed on the plunger or the piston rod and pushed into the housing one by one → Technical Manual.

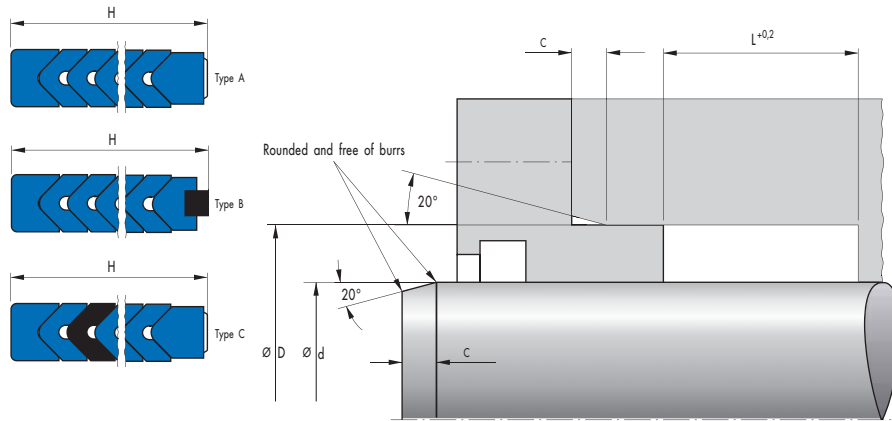
Housing



Adjustable housings have the advantage of an optimal adjustment option for the sealing effect with minimal idling friction. After a lengthy period of running and incipient wear on the seal tightening

the gland can extend the durability and significantly delay a system standstill. For adjustable housings an extension of 2,5% and an adjustability of 7,5% of dimension L is recommended. Non-adjustable housings have the advantage of more cost-effective manufacture, because washers are not required. Seal set type B is particularly recommended for these housings. The rubber-sprung back-up rings handle the function of initial compression and continuous re-adjustment during operation. Maintenance of the seal contact area is not required. This takes optimum advantage of the durability of the seal set.

Article list

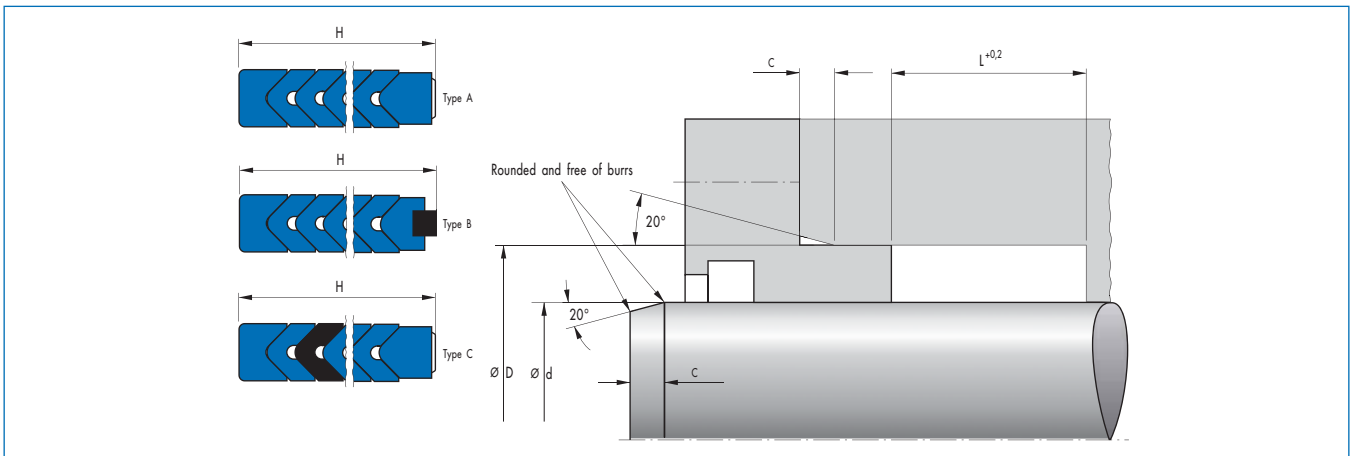


d	D	L	C	Housing	Type	Material	Type	Article No.	
16	26	18,5	3		C closed	BI-F B3K674	ESV	24148034	○
20	28	14,5	3	ISO	C closed	BI-N B3B246	ES	24120639	○
20	30	13,5	3		C closed	BI-N B3B246	ES	24077934	●
20	30	13,5	3		C closed	BI-F B3K674	ESV	24192811	○
20	30	16	3	ISO	C closed	BI-N B3B246	ES	24220043	○
20	30	16	3	ISO	C closed	BI-F B3K674	ESV	24219984	○
20	30	18,5	3		C closed	BI-N B3B246	ES	24070179	●
20	30	18,5	3		C closed	BI-F B3K674	ESV	24139067	○
20	32	22,5	3		C closed	BI-F B3K674	ESV	24139053	○
22	30	14,5	3	ISO	C closed	BI-N B3B246	ES	24120640	○
22	32	13,5	3		C closed	BI-N B3B246	ES	24062158	●
22	32	13,5	3		C closed	BI-F B3K674	ESV	24144548	○
22	32	16	3	ISO	C closed	BI-N B3B246	ES	24220044	○
22	32	16	3	ISO	C closed	BI-F B3K674	ESV	24219986	○
22	32	18,5	3		C closed	BI-N B3B246	ES	24070180	●
22	32	18,5	3		C closed	BI-F B3K674	ESV	24148036	○
25	33	14,5	3	ISO	C closed	BI-N B3B246	ES	24120641	○
25	35	16	3	ISO	C closed	BI-N B3B246	ES	24220045	○
25	35	16	3	ISO	C closed	BI-F B3K674	ESV	24219988	○
25	37	16,5	3		C closed	BI-N B3B246	ES	24062166	○
25	37	16,5	3		C closed	BI-F B3K674	ESV	24219989	○
25	37	22,5	3		C closed	BI-N B3B246	ES	24070181	●
25	37	22,5	3		C closed	BI-F B3K674	ESV	24148037	○
28	38	16	3	ISO	C closed	BI-N B3B246	ES	24120642	○
28	38	16	3	ISO	C closed	BI-F B3K674	ESV	24219990	○
28	40	16,5	3		C closed	BI-N B3B246	ES	24062159	●
28	40	16,5	3		C closed	BI-F B3K674	ESV	24144546	○
28	40	22,5	3		C closed	BI-N B3B246	ES	24070182	●
28	40	22,5	3		C closed	BI-F B3K674	ESV	24139068	●
28	43	25	5	ISO	C closed	BI-N B3B246	ES	24220046	○
28	43	25	5	ISO	C closed	BI-F B3K674	ESV	24219991	○
30	42	16,5	3		C closed	BI-N B3B246	ES	24220047	○
30	42	16,5	3		C closed	BI-F B3K674	ESV	24219992	○
30	42	22,5	3		C closed	BI-N B3B246	ES	24070183	●
30	42	22,5	3		C closed	BI-F B3K674	ESV	24139069	○
32	42	16	3	ISO	C closed	BI-N B3B246	ES	24120643	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	C	Housing	Type	Material	Type	Article No.	
32	42	16	3	ISO	C closed	BI-F B3K674	ESV	24219993	○
32	44	16,5	3		C closed	BI-N B3B246	ES	24078187	○
32	44	16,5	3		C closed	BI-F B3K674	ESV	24191167	○
32	44	22,5	3		C closed	BI-N B3B246	ES	24070184	●
32	44	22,5	3		C closed	BI-F B3K674	ESV	24139070	○
32	47	25	5	ISO	C closed	BI-N B3B246	ES	24327287	○
32	47	25	5	ISO	C closed	BI-F B3K674	ESV	24219994	○
35	47	16,5	3		C closed	BI-N B3B246	ES	24062171	○
35	47	16,5	3		C closed	BI-F B3K674	ESV	24219995	○
35	47	22,5	3		C closed	BI-N B3B246	ES	24070185	●
35	47	22,5	3		C closed	BI-F B3K674	ESV	24139071	○
36	46	16	3	ISO	C closed	BI-N B3B246	ES	24120644	○
36	46	16	3	ISO	C closed	BI-F B3K674	ESV	24219996	○
36	46	22,5	3		C closed	BI-F B3K674	ESV	527783	○
36	48	16,5	3		C closed	BI-N B3B246	ES	24084373	●
36	48	16,5	3		C closed	BI-F B3K674	ESV	24149112	○
36	48	22,5	3		C closed	BI-N B3B246	ES	24070186	●
36	48	22,5	3		C closed	BI-F B3K674	ESV	24138994	●
36	51	25	5	ISO	C closed	BI-N B3B246	ES	24327286	●
36	51	25	5	ISO	C closed	BI-F B3K674	ESV	24219997	○
40	50	16	3	ISO	C closed	BI-N B3B246	ES	24120645	●
40	50	16	3	ISO	C closed	BI-F B3K674	ESV	24219998	○
40	52	16,5	3		C closed	BI-N B3B246	ES	24062173	●
40	52	16,5	3		C closed	BI-F B3K674	ESV	24175597	○
40	52	22,5	3		C closed	BI-N B3B246	ES	24070187	●
40	52	22,5	3		C closed	BI-F B3K674	ESV	24139072	○
40	55	25	5	ISO	C closed	BI-N B3B246	ES	24220050	●
40	55	25	5	ISO	C closed	BI-F B3K674	ESV	24219999	○
45	55	16	3	ISO	C closed	BI-N B3B246	ES	24120646	●
45	55	16	3	ISO	C closed	BI-F B3K674	ESV	24220000	○
45	60	16,5	5		C closed	BI-N B3B246	ES	24062175	●
45	60	16,5	5		C closed	BI-F B3K674	ESV	24149108	○
45	60	22,5	5		C closed	BI-N B3B246	ES	24070189	●
45	60	22,5	5		C closed	BI-F B3K674	ESV	24138993	●
45	60	25	5	ISO	C closed	BI-N B3B246	ES	24327285	●
45	60	25	5	ISO	C closed	BI-F B3K674	ESV	24220001	○
50	60	16	3	ISO	C closed	BI-N B3B246	ES	24120647	○
50	60	16	3	ISO	C closed	BI-F B3K674	ESV	24220002	○
50	65	16,5	5		C closed	BI-N B3B246	ES	24062178	●
50	65	16,5	5		C closed	BI-F B3K674	ESV	24186958	○
50	65	22,5	5		C closed	BI-N B3B246	ES	24070190	●
50	65	22,5	5		C closed	BI-F B3K674	ESV	24139074	●
50	65	25	5	ISO	C closed	BI-N B3B246	ES	24327284	●
50	65	25	5	ISO	C closed	BI-F B3K674	ESV	24220003	○
55	70	16,5	5		C closed	BI-N B3B246	ES	24063126	●
55	70	16,5	5		C closed	BI-F B3K674	ESV	24194608	○
55	70	22,5	5		C closed	BI-N B3B246	ES	24070191	●
55	70	22,5	5		C closed	BI-F B3K674	ESV	24129136	○
55	75	30	5		C closed	BI-F B4K674	ESV	24139318	○
56	71	16,5	5		C closed	BI-N B3B246	ES	24112157	●

● Available from stock ○ On request: Tool is available, delivery at short notice

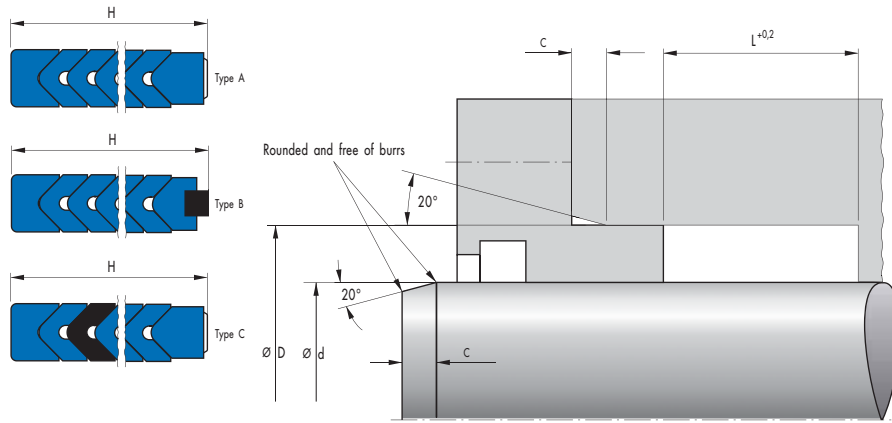


d	D	L	C	Housing	Type	Material	Type	Article No.	
56	71	16,5	5		C closed	BI-F B3K674	ESV	24149111	●
56	71	22,5	5		C closed	BI-N B3B246	ES	24070192	●
56	71	22,5	5		C closed	BI-F B3K674	ESV	24139076	●
56	71	25	5	ISO	C closed	BI-N B3B246	ES	24327283	○
56	71	25	5	ISO	C closed	BI-F B3K674	ESV	24220004	○
56	76	32	5	ISO	C closed	BI-N B4B246	ES	24220054	○
56	76	32	5	ISO	C closed	BI-F B4K674	ESV	24220005	○
56	76	37	5		C closed	BI-F B4K674	ESV	24139131	○
60	75	16,5	5		C closed	BI-N B3B246	ES	24062181	●
60	75	16,5	5		C closed	BI-F B3K674	ESV	24194385	○
60	75	22,5	5		C closed	BI-N B3B246	ES	24070193	●
60	75	22,5	5		C closed	BI-F B3K674	ESV	24148038	●
60	80	37	5		C closed	BI-F B4K674	ESV	24103349	○
63	78	16,5	5		C closed	BI-N B3B246	ES	24114075	○
63	78	16,5	5		C closed	BI-F B4K674	ESV	24220006	○
63	78	22,5	5		C closed	BI-N B3B246	ES	24070194	●
63	78	22,5	5		C closed	BI-F B4K674	ESV	24148039	○
63	78	25	5	ISO	C closed	BI-N B3B246	ES	24327282	○
63	78	25	5	ISO	C closed	BI-F B4K674	ESV	24220007	○
63	83	32	5	ISO	C closed	BI-N B4B246	ES	24220056	○
63	83	32	5	ISO	C closed	BI-F B4K674	ESV	24220008	○
65	80	16,5	5		C closed	BI-N B3B246	ES	24062183	○
65	80	16,5	5		C closed	BI-F B3K674	ESV	24220009	○
65	80	22,5	5		C closed	BI-N B3B246	ES	24070195	●
65	80	22,5	5		C closed	BI-F B3K674	ESV	24139077	○
70	85	16,5	5		C closed	BI-N B3B246	ES	24062188	●
70	85	16,5	5		C closed	BI-F B3K674	ESV	24144001	○
70	85	22,5	5		C closed	BI-N B3B246	ES	24070196	●
70	85	22,5	5		C closed	BI-F B3K674	ESV	24138992	●
70	85	25	5	ISO	C closed	BI-N B3B246	ES	24327280	●
70	85	25	5	ISO	C closed	BI-F B3K674	ESV	24220010	○
70	90	32	5	ISO	C closed	BI-N B4B246	ES	24220058	○
70	90	32	5	ISO	C closed	BI-F B4K674	ESV	24220011	○
70	90	40	5		C closed	BI-F B4K674	ESV	24104730	○
75	90	16,5	5		C closed	BI-N B3B246	ES	24061639	○
75	90	16,5	5		C closed	BI-F B3K674	ESV	24220012	○
75	90	22,5	5		C closed	BI-N B3B246	ES	24070197	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	C	Housing	Type	Material	Type	Article No.	
75	90	22,5	5		C closed	BI-F B3K674	ESV	24148040	○
80	95	16,5	5		C closed	BI-N B3B246	ES	24062194	●
80	95	16,5	5		C closed	BI-F B3K674	ESV	24149110	○
80	95	22,5	5		C closed	BI-N B3B246	ES	24070198	●
80	95	22,5	5		C closed	BI-F B3K674	ESV	24139078	○
80	95	25	5	ISO	C closed	BI-N B3B246	ES	24060905	○
80	95	25	5	ISO	C closed	BI-F B3K674	ESV	24220013	○
80	100	32	5	ISO	C closed	BI-N B4B246	ES	24220060	●
80	100	32	5	ISO	C closed	BI-F B4K674	ESV	24220014	○
80	100	40	5		C closed	BI-F B4K674	ESV	24104763	○
85	100	16,5	5		C closed	BI-N B3B246	ES	24078907	○
85	100	16,5	5		C closed	BI-F B3K674	ESV	24194607	○
85	100	22,5	5		C closed	BI-N B3B246	ES	24070199	●
85	100	22,5	5		C closed	BI-F B3K674	ESV	24106403	○
90	105	22,5	5		C closed	BI-F B3K674	ESV	24138991	○
90	105	25	5	ISO	C closed	BI-F B3K674	ESV	24220015	○
90	110	30	5		C closed	BI-N B4B246	ES	24062197	●
90	110	30	5		C closed	BI-F B4K674	ESV	24194606	○
90	110	32	5	ISO	C closed	BI-N B4B246	ES	24220061	●
90	110	32	5	ISO	C closed	BI-F B4K674	ESV	24220016	○
90	110	40	5		C closed	BI-N B4B246	ES	24070231	●
90	110	40	5		C closed	BI-F B4K674	ESV	24119600	●
100	115	30	5		C closed	BI-F B3K674	ESV	24099496	○
100	120	30	5		C closed	BI-N B4B246	ES	24062201	●
100	120	30	5		C closed	BI-F B4K674	ESV	24220017	○
100	120	32	5	ISO	C closed	BI-N B4B246	ES	24126541	●
100	120	32	5	ISO	C closed	BI-F B4K674	ESV	24220018	○
100	120	39	5		C closed	BI-N B4B246	ES	24132386	○
100	120	40	5		C closed	BI-F B4K674	ESV	24104764	●
100	125	40	7,5	ISO	C closed	BI-N B4B246	ES	24220062	●
100	125	40	7,5	ISO	C closed	BI-F B4K674	ESV	24220019	○
110	125	30	5		C closed	BI-F B3K674	ESV	24099500	○
110	130	30	5		C closed	BI-N B4B246	ES	24062205	●
110	130	30	5		C closed	BI-F B4K674	ESV	24220020	○
110	130	32	5	ISO	C closed	BI-N B4B246	ES	24220063	●
110	130	32	5	ISO	C closed	BI-F B4K674	ESV	24220021	○
110	130	40	5		C closed	BI-N B4B246	ES	24070233	●
110	130	40	5		C closed	BI-F B4K674	ESV	24107792	●
110	135	40	7,5	ISO	C closed	BI-N B4B246	ES	24220064	○
110	135	40	7,5	ISO	C closed	BI-F B4K674	ESV	24220022	○
115	140	34	7,5		C closed	BI-N B4B246	ES	24081735	○
115	140	34	7,5		C closed	BI-F B4K674	ESV	24220023	○
115	140	46	7,5		C closed	BI-N B4B246	ES	24070234	●
115	140	46	7,5		C closed	BI-F B4K674	ESV	24119599	○
125	140	34	7,5		C closed	BI-F B3K674	ESV	24139062	○
125	145	32	5	ISO	C closed	BI-N B4B246	ES	24220065	●
125	145	32	5	ISO	C closed	BI-F B4K674	ESV	24220024	○
125	150	34	7,5		C closed	BI-N B4B246	ES	24062207	●
125	150	34	7,5		C closed	BI-F B4K674	ESV	24220025	○
125	150	40	7,5	ISO	C closed	BI-N B4B246	ES	24220066	●

● Available from stock ○ On request: Tool is available, delivery at short notice

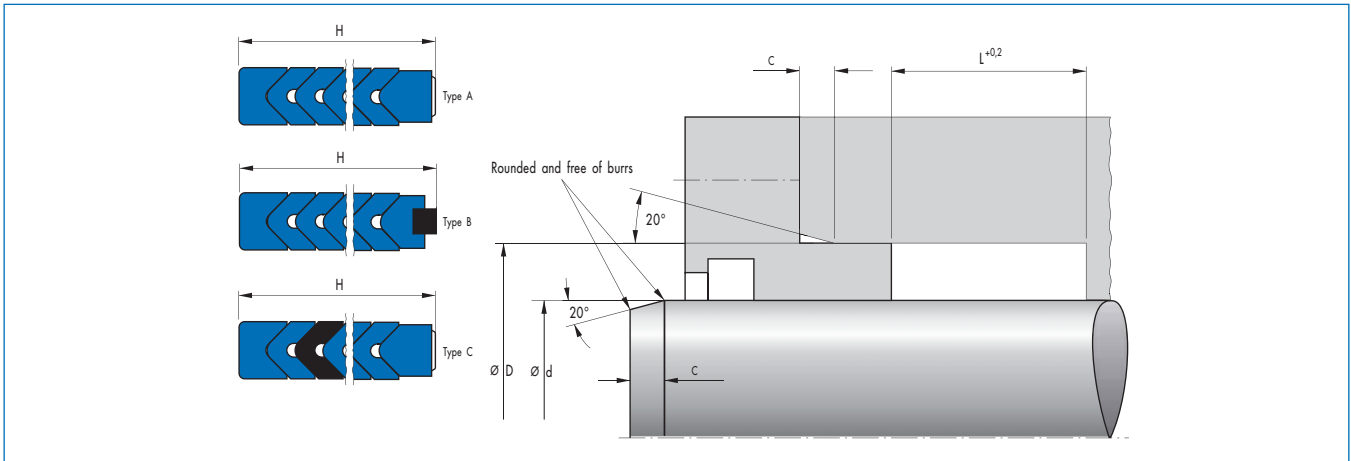


d	D	L	C	Housing	Type	Material	Type	Article No.	
125	150	40	7,5	ISO	C closed	BI-F B4K674	ESV	24220026	○
125	150	46	7,5		C closed	BI-N B4B246	ES	24070235	●
125	150	46	7,5		C closed	BI-F B4K674	ESV	24139162	○
140	155	34	7,5		C closed	BI-F B3K674	ESV	24139063	○
140	160	32	5	ISO	C closed	BI-N B4B246	ES	24194357	●
140	160	32	5	ISO	C closed	BI-F B4K674	ESV	24220027	○
140	165	34	7,5		C closed	BI-N B4B246	ES	24220067	○
140	165	34	7,5		C closed	BI-F B4K674	ESV	24220028	○
140	165	40	7,5	ISO	C closed	BI-N B4B246	ES	24220068	●
140	165	40	7,5	ISO	C closed	BI-F B4K674	ESV	24220029	○
140	165	46	7,5		C closed	BI-N B4B246	ES	24070236	●
140	165	46	7,5		C closed	BI-F B4K674	ESV	24139305	○
150	180	45	7,5		A closed	BI-N B4B246	ES	24061736	●
150	180	45	7,5		A closed	BI-F B4K674	ESV	24220030	○
150	180	60	7,5		A closed	BI-N B4B246	ES	24070237	●
150	180	60	7,5		A open	BI-N B4B246	ES	24170282	○
150	180	60	7,5		A closed	BI-F B4K674	ESV	24148030	○
160	180	40	7,5		A closed	BI-F B4K674	ESV	24139064	○
160	185	40	7,5	ISO	A closed	BI-N B4B246	ES	24220069	○
160	185	40	7,5	ISO	A closed	BI-F B4K674	ESV	24220031	○
160	190	45	7,5		A closed	BI-N B4B246	ES	24061737	○
160	190	45	7,5		A closed	BI-F B4K674	ESV	24220032	○
160	190	50	7,5	ISO	A closed	BI-F B4K674	ESV	24220033	○
160	190	60	7,5		A closed	BI-N B4B246	ES	24070238	●
160	190	60	7,5		A open	BI-N B4B246	ES	24087331	○
160	190	60	7,5		A closed	BI-F B4K674	ESV	24107183	●
180	200	40	7,5		A closed	BI-F B4K674	ESV	24143887	○
180	205	40	7,5	ISO	A closed	BI-N B4B246	ES	24220071	●
180	205	40	7,5	ISO	A closed	BI-F B4K674	ESV	24220034	○
180	210	45	7,5		A closed	BI-N B4B246	ES	24061739	●
180	210	45	7,5		A closed	BI-F B4K674	ESV	24149739	○
180	210	50	7,5	ISO	A closed	BI-N B4B246	ES	24131959	●
180	210	50	7,5	ISO	A closed	BI-F B4K674	ESV	24220035	○
180	210	60	7,5		A closed	BI-N B4B246	ES	24070239	●
180	210	60	7,5		A closed	BI-F B4K674	ESV	24139298	●
190	220	60,5	7,5		A closed	BI-F B4K674	ESV	533505	○
200	225	40	7,5	ISO	A closed	BI-N B4B246	ES	24220072	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	C	Housing	Type	Material	Type	Article No.	
200	230	45	7,5		A closed	BI-N B4B246	ES	24064261	●
200	230	45	7,5		A closed	BI-F B4K674	ESV	24173014	○
200	230	50	7,5	ISO	A closed	BI-N B4B246	ES	24076302	●
200	230	50	7,5	ISO	A closed	BI-F B4K674	ESV	24220037	○
200	230	50,5	7,5		A open	BI-N B4B246	ES	24218873	○
200	230	50,5	7,5		A closed	BI-N B4B246	ES	24219156	○
200	230	51,5	7,5	ISO	B open	BI-N B4B246	ES	24145843	○
200	230	52	7,5		B closed	BI-N B4B246	ES	24218713	○
200	230	60	7,5		A closed	BI-N B4B246	ES	24070240	●
200	230	60	7,5		B open	BI-N B4B246	ES	24079136	○
200	230	60	7,5		A open	BI-N B4B246	ES	24135050	○
200	230	60	7,5		A closed	BI-F B4K674	ESV	24107185	●
200	230	61,5	7,5		B closed	BI-N B4B246	ES	24146349	○
220	250	50	7,5	ISO	A closed	BI-N B4B246	ES	24061745	●
220	250	50,5	7,5		A open	BI-N B4B246	ES	24114136	○
220	250	50,5	7,5		A closed	BI-N B4B246	ES	24219165	○
220	250	52	7,5		B open	BI-N B4B246	ES	24218512	○
220	250	52	7,5		B closed	BI-N B4B246	ES	24218722	○
220	250	60	7,5		A closed	BI-N B4B246	ES	24063737	●
220	250	60	7,5		A open	BI-N B4B246	ES	24218891	○
220	250	61,5	7,5		B closed	BI-N B4B246	ES	24100511	○
220	250	61,5	7,5		B open	BI-N B4B246	ES	24114159	○
225	255	50,5	7,5		A closed	BI-N B4B246	ES	24100216	○
225	255	50,5	7,5		A open	BI-N B4B246	ES	24218892	○
225	255	60	7,5		A closed	BI-N B4B246	ES	24067706	○
225	255	60	7,5		A open	BI-N B4B246	ES	24218895	○
225	255	61,5	7,5		B closed	BI-N B4B246	ES	24064015	○
225	255	61,5	7,5		B open	BI-N B4B246	ES	24218517	○
240	270	50,5	7,5		A open	BI-N B4B246	ES	24218903	○
240	270	50,5	7,5		A closed	BI-N B4B246	ES	24219174	○
240	270	52	7,5		B open	BI-N B4B246	ES	24218522	○
240	270	52	7,5		B closed	BI-N B4B246	ES	24218734	○
240	270	60	7,5		A closed	BI-N B4B246	ES	24061635	○
240	270	60	7,5		A open	BI-N B4B246	ES	24177276	○
240	270	61,5	7,5		B closed	BI-N B4B246	ES	24083267	○
240	270	61,5	7,5		B open	BI-N B4B246	ES	24083524	○
250	280	50,5	7,5		A closed	BI-N B4B246	ES	24100419	○
250	280	50,5	7,5		A open	BI-N B4B246	ES	24218910	●
250	280	52	7,5		B open	BI-N B4B246	ES	24218527	○
250	280	52	7,5		B closed	BI-N B4B246	ES	24218737	○
250	280	60	7,5		A closed	BI-N B4B246	ES	24061638	●
250	280	60	7,5		A open	BI-N B4B246	ES	24218913	○
250	280	61,5	7,5		B closed	BI-N B4B246	ES	24104086	○
250	280	61,5	7,5		B open	BI-N B4B246	ES	24218529	○
260	290	50,5	7,5		A closed	BI-N B4B246	ES	24067374	○
260	290	50,5	7,5		A open	BI-N B4B246	ES	24218917	○
260	290	52	7,5		B open	BI-N B4B246	ES	24218534	○
260	290	52	7,5		B closed	BI-N B4B246	ES	24218739	○
260	290	60	7,5		A open	BI-N B4B246	ES	24218920	○
260	290	60	7,5		A closed	BI-N B4B246	ES	24219178	○

● Available from stock ○ On request: Tool is available, delivery at short notice

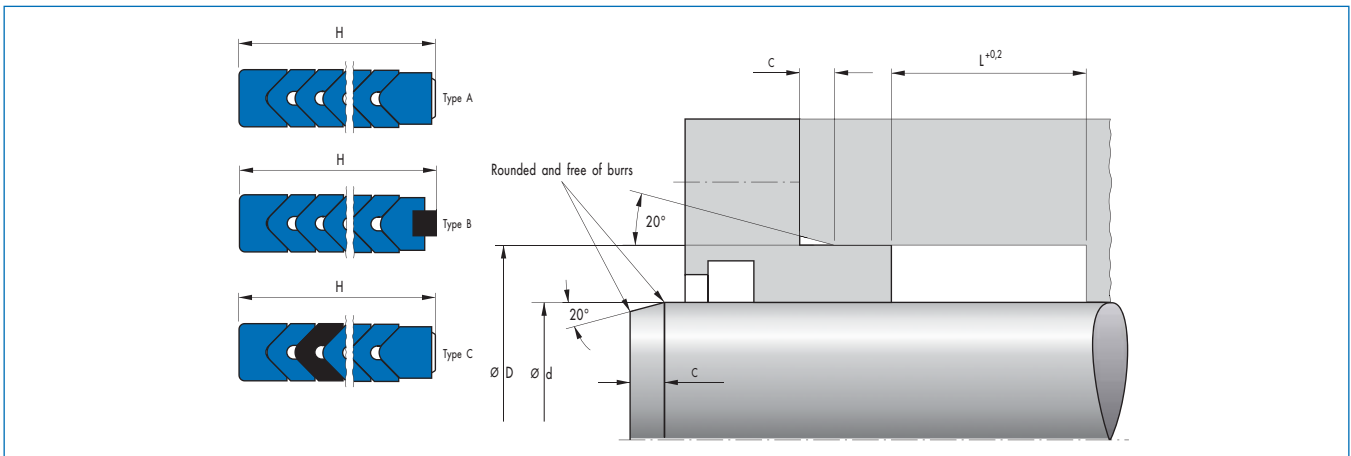


d	D	L	C	Housing	Type	Material	Type	Article No.	
260	290	61,5	7,5		B closed	BI-N B4B246	ES	24101540	○
260	290	61,5	7,5		B open	BI-N B4B246	ES	24218537	○
280	310	50,5	7,5		A closed	BI-N B4B246	ES	24219179	○
280	310	60	7,5		A closed	BI-N B4B246	ES	24066929	●
280	310	60	7,5		A open	BI-N B4B246	ES	24218933	○
280	310	61,5	7,5		B closed	BI-N B4B246	ES	24064013	○
280	310	61,5	7,5		B open	BI-N B4B246	ES	24071155	○
280	320	80	10		A closed	BI-N B4B246	ES	24072791	●
280	320	80	10		A open	BI-N B4B246	ES	24114214	○
280	320	81,5	10		B closed	BI-N B4B246	ES	24113699	○
280	320	81,5	10		B open	BI-N B4B246	ES	24121893	○
300	330	50,5	7,5		A open	BI-N B4B246	ES	24218941	○
300	330	52	7,5		B open	BI-N B4B246	ES	24121478	○
300	330	58	7,5		A closed	BI-N B4B246	ES	24074670	●
300	330	60	7,5		A open	BI-N B4B246	ES	24218944	○
300	330	61,5	7,5		B open	BI-N B4B246	ES	24071159	○
300	340	80	10		A closed	BI-N B4B246	ES	24073340	○
300	340	80	10		A open	BI-N B4B246	ES	24078123	○
300	340	81,5	10		B closed	BI-N B4B246	ES	24066737	○
300	340	81,5	10		B open	BI-N B4B246	ES	24114599	○
320	350	50,5	7,5		A open	BI-N B4B246	ES	24218956	○
320	350	52	7,5		B open	BI-N B4B246	ES	24218559	○
320	350	60	7,5		A open	BI-N B4B246	ES	24218959	○
320	350	61,5	7,5		B open	BI-N B4B246	ES	24071163	○
320	360	64,5	10	ISO	B open	BI-N B4B246	ES	24145831	○
320	360	80	10		A closed	BI-N B4B246	ES	24066450	○
320	360	80	10		A open	BI-N B4B246	ES	24218961	○
320	360	81,5	10		B closed	BI-N B4B246	ES	24084628	○
320	360	81,5	10		B open	BI-N B4B246	ES	24111755	○
340	370	50,5	7,5		A open	BI-N B4B246	ES	24099882	○
340	370	52	7,5		B open	BI-N B4B246	ES	24218566	○
340	370	58	7,5		A open	BI-N B4B246	ES	24081906	○
340	370	60	7,5		A open	BI-N B4B246	ES	24218968	○
340	380	80	10		A closed	BI-N B4B246	ES	24063605	○
340	380	80	10		A open	BI-N B4B246	ES	24218969	○
340	380	81,5	10		B closed	BI-N B4B246	ES	24069050	○
340	380	81,5	10		B open	BI-N B4B246	ES	24148207	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	C	Housing	Type	Material	Type	Article No.	
360	390	50,5	7,5		A open	BI-N B4B210	ES	24218979	○
360	390	50,5	7,5		A closed	BI-N B4B246	ES	24087305	○
360	390	52	7,5		B open	BI-N B4B210	ES	24218577	○
360	390	58	7,5		A closed	BI-N B4B246	ES	24097554	○
360	390	60	7,5		A open	BI-N B4B210	ES	24218982	○
360	390	60	7,5		A closed	BI-N B4B246	ES	24219196	○
360	390	61,5	7,5		B open	BI-N B4B210	ES	24073530	○
360	390	61,5	7,5		B closed	BI-N B4B246	ES	24218775	○
360	400	64,5	10	ISO	B open	BI-N B4B246	ES	24145834	○
360	400	80	10		A closed	BI-N B4B246	ES	24061644	○
360	400	80	10		A open	BI-N B4B246	ES	24084039	○
360	400	81,5	10		B closed	BI-N B4B246	ES	24068143	○
360	400	81,5	10		B open	BI-N B4B246	ES	24123407	○
370	400	50,5	7,5		A open	BI-N B4B210	ES	24218984	○
370	400	52	7,5		B open	BI-N B4B210	ES	24218580	○
370	400	60	7,5		A open	BI-N B4B210	ES	24218987	○
370	400	61,5	7,5		B open	BI-N B4B210	ES	24107401	○
370	410	80	10		A closed	BI-N B4B246	ES	24099626	○
370	410	80	10		A open	BI-N B4B246	ES	24218989	○
370	410	81,5	10		B open	BI-N B4B246	ES	24097789	○
370	410	81,5	10		B closed	BI-N B4B246	ES	24194332	○
380	410	50,5	7,5		A open	BI-N B4B210	ES	24218990	○
380	410	60	7,5		A open	BI-N B4B210	ES	24218993	○
380	410	61,5	7,5		B open	BI-N B4B210	ES	24213225	○
380	420	80	10		A closed	BI-N B4B246	ES	24069067	○
380	420	81,5	10		B closed	BI-N B4B246	ES	24069165	○
390	420	50,5	7,5		A open	BI-N B4B210	ES	24218996	○
390	420	52	7,5		B open	BI-N B4B210	ES	24218588	○
390	420	60	7,5		A open	BI-N B4B210	ES	24187142	○
390	420	61,5	7,5		B open	BI-N B4B210	ES	24126556	○
390	430	80	10		A open	BI-N B4B210	ES	24145527	○
390	430	81,5	10		B open	BI-N B4B210	ES	24100035	○
400	430	50,5	7,5		A open	BI-N B4B210	ES	24219000	○
400	430	50,5	7,5		A closed	BI-N B4B210	ES	24219197	○
400	430	52,5	7,5		A open	BI-N B4B210	ES	24198468	○
400	430	52,5	7,5		A closed	BI-N B4B210	ES	24219198	○
400	430	60	7,5		A open	BI-N B4B210	ES	24087212	○
400	430	60	7,5		A closed	BI-N B4B210	ES	24219200	○
400	430	61,5	7,5		B open	BI-N B4B210	ES	24071209	○
400	430	61,5	7,5		B closed	BI-N B4B210	ES	24087903	○
400	440	70	10		A open	BI-N B4B210	ES	24219002	○
400	440	70	10		A closed	BI-N B4B210	ES	24219201	○
400	440	79	10		A closed	BI-N B4B210	ES	24219202	○
400	440	80	10		A closed	BI-N B4B210	ES	24071557	○
400	440	80	10		A open	BI-N B4B210	ES	24219004	○
400	440	81,5	10		B closed	BI-N B4B210	ES	24086147	○
400	440	81,5	10		B open	BI-N B4B210	ES	24113319	○
400	440	89	10		A closed	BI-N B4B210	ES	24219203	○
400	440	90,5	10		B open	BI-N B4B210	ES	24218593	○
410	440	52,5	7,5		A open	BI-N B4B210	ES	24219006	○

● Available from stock ○ On request: Tool is available, delivery at short notice

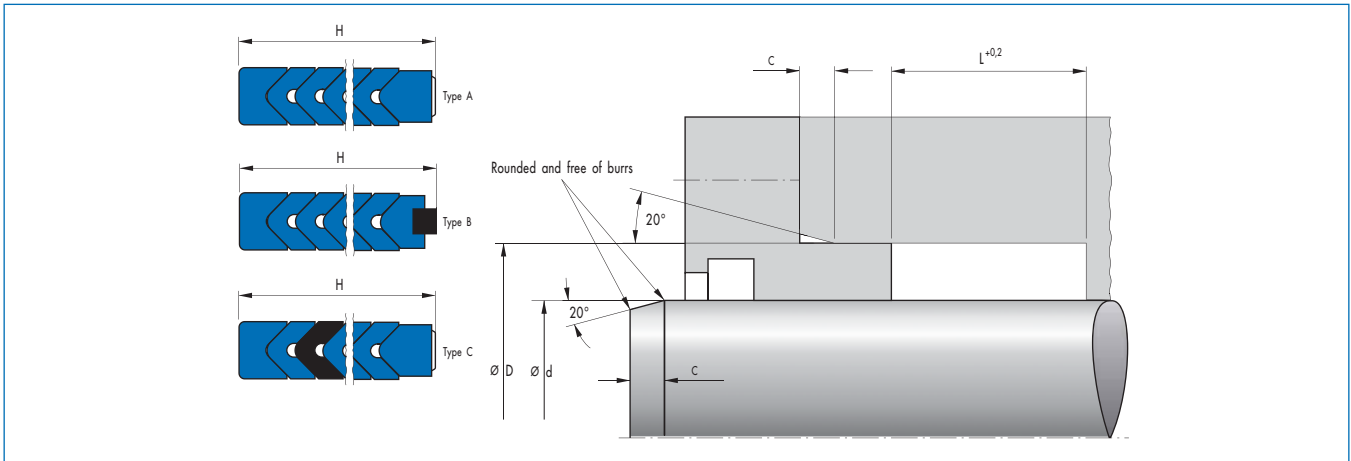


d	D	L	C	Housing	Type	Material	Type	Article No.	
410	440	54	7,5		B open	BI-N B4B210	ES	24218594	○
410	440	60	7,5		A open	BI-N B4B210	ES	24219007	○
410	440	61,5	7,5		B open	BI-N B4B210	ES	24116167	○
410	445	60	10		A closed	BI-N B4B210	ES	24114451	○
410	450	70	10		A closed	BI-N B4B210	ES	24108466	○
410	450	70	10		A open	BI-N B4B210	ES	24219008	○
410	450	71,5	10		B closed	BI-N B4B210	ES	24140331	○
410	450	71,5	10		B open	BI-N B4B210	ES	24218595	○
410	450	79	10		A open	BI-N B4B210	ES	24219009	○
410	450	79	10		A closed	BI-N B4B210	ES	24219204	○
410	450	80	10		A closed	BI-N B4B210	ES	24196025	○
410	450	80	10		A open	BI-N B4B210	ES	24219010	○
410	450	80,5	10		B open	BI-N B4B210	ES	24218596	○
410	450	80,5	10		B closed	BI-N B4B210	ES	24218780	○
410	450	81,5	10		B open	BI-N B4B210	ES	24136066	○
410	450	81,5	10		B closed	BI-N B4B210	ES	24218781	○
410	450	81,5	10		B closed	BI-N B4B210	ES	24218782	○
410	450	89	10		A open	BI-N B4B210	ES	24219011	○
410	450	89	10		A closed	BI-N B4B210	ES	24219205	○
410	450	90,5	10		B open	BI-N B4B210	ES	24218597	○
415	455	61,5	10		B open	BI-N B4B210	ES	24267389	○
415	455	81,5	10		B open	BI-N B4B210	ES	24128991	○
420	450	52,5	7,5		A open	BI-N B4B210	ES	24219012	○
420	450	54	7,5		B open	BI-N B4B210	ES	24218598	○
420	450	60	7,5		A open	BI-N B4B210	ES	24219013	○
420	450	61,5	7,5		B open	BI-N B4B210	ES	24071213	○
420	460	60	10		A closed	BI-N B4B210	ES	24098516	○
420	460	60	10		A open	BI-N B4B210	ES	24289410	○
420	460	70	10		A closed	BI-N B4B210	ES	24109496	○
420	460	70	10		A open	BI-N B4B210	ES	24134937	○
420	460	71,5	10		B open	BI-N B4B210	ES	24069492	○
420	460	71,5	10		B closed	BI-N B4B210	ES	24074765	○
420	460	79	10		A open	BI-N B4B210	ES	24219014	○
420	460	79	10		A closed	BI-N B4B210	ES	24219206	○
420	460	80	10		A closed	BI-N B4B210	ES	24077332	○
420	460	80	10		A open	BI-N B4B210	ES	24219015	○
420	460	80,5	10		B open	BI-N B4B210	ES	24218599	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	C	Housing	Type	Material	Type	Article No.	
420	460	80,5	10		B closed	BI-N B4B210	ES	24218783	○
420	460	81,5	10		B open	BI-N B4B210	ES	24129597	○
420	460	81,5	10		B closed	BI-N B4B210	ES	24218784	○
420	460	81,5	10		B closed	BI-N B4B210	ES	24218785	○
420	460	89	10		A open	BI-N B4B210	ES	24219016	○
420	460	89	10		A closed	BI-N B4B210	ES	24219207	○
420	460	90,5	10		B open	BI-N B4B210	ES	24218600	○
425	465	70	10		A open	BI-N B4B210	ES	24090496	○
425	465	71,5	10		B open	BI-N B4B210	ES	24121155	○
425	465	81,5	10		B open	BI-N B4B210	ES	24083265	○
430	460	52,5	7,5		A open	BI-N B4B210	ES	24219017	○
430	460	54	7,5		B open	BI-N B4B210	ES	24218601	○
430	460	60	7,5		A open	BI-N B4B210	ES	24219018	○
430	460	61,5	7,5		B open	BI-N B4B210	ES	24218602	○
430	470	60	10		A open	BI-N B4B210	ES	24298359	○
430	470	61,5	10		B open	BI-N B4B210	ES	24082970	○
430	470	70	10		A open	BI-N B4B210	ES	24219019	○
430	470	71,5	10		B open	BI-N B4B210	ES	24177234	○
430	470	79	10		A open	BI-N B4B210	ES	24219020	○
430	470	80	10		A open	BI-N B4B210	ES	24219021	○
430	470	80,5	10		B open	BI-N B4B210	ES	24218603	○
430	470	81,5	10		B open	BI-N B4B210	ES	24097838	○
430	470	89	10		A open	BI-N B4B210	ES	24219022	○
430	470	90,5	10		B open	BI-N B4B210	ES	24218604	○
440	470	52,5	7,5		A open	BI-N B4B210	ES	24219023	○
440	470	54	7,5		B open	BI-N B4B210	ES	24218605	○
440	470	60	7,5		A open	BI-N B4B210	ES	24219024	○
440	470	61,5	7,5		B open	BI-N B4B210	ES	24218606	○
440	480	60	10		A closed	BI-N B4B210	ES	24072171	○
440	480	61,5	10		B closed	BI-N B4B210	ES	24148125	○
440	480	70	10		A closed	BI-N B4B210	ES	24099123	○
440	480	70	10		A open	BI-N B4B210	ES	24219025	○
440	480	71,5	10		B closed	BI-N B4B210	ES	24137057	○
440	480	71,5	10		B open	BI-N B4B210	ES	24218607	○
440	480	79	10		A open	BI-N B4B210	ES	24219026	○
440	480	79	10		A closed	BI-N B4B210	ES	24219208	○
440	480	80	10		A closed	BI-N B4B210	ES	24073676	○
440	480	80	10		A open	BI-N B4B210	ES	24219027	○
440	480	80,5	10		B open	BI-N B4B210	ES	24218608	○
440	480	80,5	10		B closed	BI-N B4B210	ES	24218786	○
440	480	81,5	10		B open	BI-N B4B210	ES	24104141	○
440	480	81,5	10		B closed	BI-N B4B210	ES	24218787	○
440	480	89	10		A open	BI-N B4B210	ES	24219028	○
440	480	89	10		A closed	BI-N B4B210	ES	24219209	○
440	480	90,5	10		B open	BI-N B4B210	ES	24218609	○
440	480	90,5	10		B closed	BI-N B4B210	ES	24218788	○
450	480	52,5	7,5		A open	BI-N B4B210	ES	24219029	○
450	480	54	7,5		B open	BI-N B4B210	ES	24218610	○
450	480	60	7,5		A open	BI-N B4B210	ES	24219030	○
450	480	60	10		A closed	BI-F B4K674	ESV	49008946	○

● Available from stock ○ On request: Tool is available, delivery at short notice

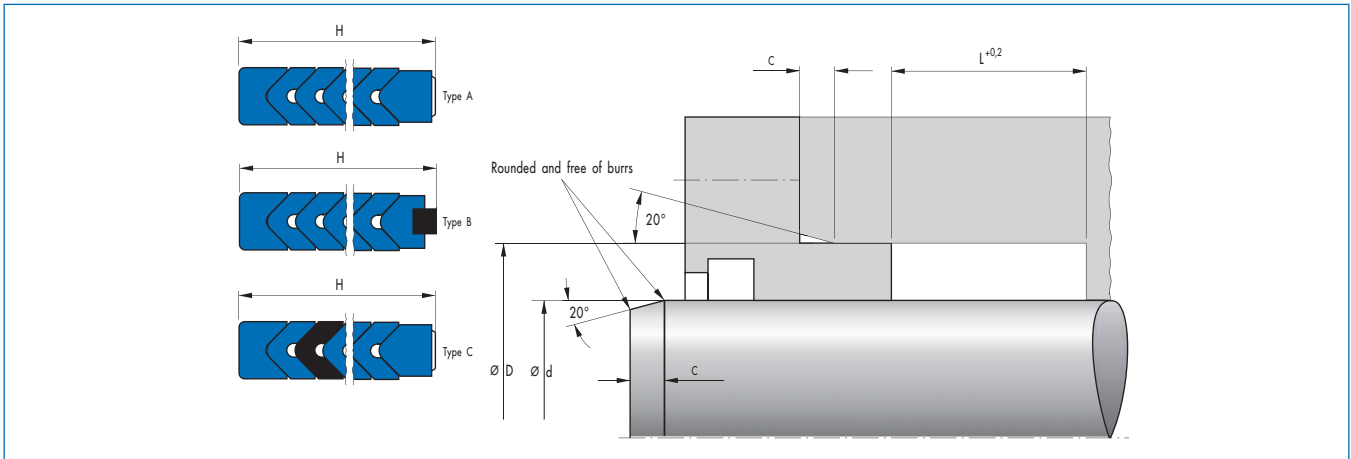


d	D	L	C	Housing	Type	Material	Type	Article No.	
450	480	61,5	7,5		B open	BI-N B4B210	ES	24218611	○
450	490	60	10		A closed	BI-N B4B210	ES	24071968	○
450	490	60	10		A open	BI-N B4B210	ES	24082110	○
450	490	61,5	10		B closed	BI-N B4B210	ES	24083442	○
450	490	61,5	10		B open	BI-N B4B210	ES	24287165	○
450	490	70	10		A open	BI-N B4B210	ES	24072716	○
450	490	70	10		A closed	BI-N B4B210	ES	24114458	○
450	490	71,5	10		B open	BI-N B4B210	ES	24149535	○
450	490	71,5	10		B closed	BI-N B4B210	ES	24218789	○
450	490	79	10		A closed	BI-N B4B210	ES	24144269	○
450	490	79	10		A open	BI-N B4B210	ES	24219031	○
450	490	80	10		A closed	BI-N B4B210	ES	24066931	○
450	490	80	10		A open	BI-N B4B210	ES	24089042	○
450	490	80,5	10		B open	BI-N B4B210	ES	24218612	○
450	490	80,5	10		B closed	BI-N B4B210	ES	24218790	○
450	490	81,5	10		B open	BI-N B4B210	ES	24075890	○
450	490	81,5	10		B closed	BI-N B4B210	ES	24087320	○
450	490	89	10		A open	BI-N B4B210	ES	24219032	○
450	490	89	10		A closed	BI-N B4B210	ES	24219210	○
450	490	90,5	10		B open	BI-N B4B210	ES	24021861	○
450	490	90,5	10		B closed	BI-N B4B210	ES	24218791	○
460	490	52,5	7,5		A open	BI-N B4B210	ES	24219033	○
460	490	52,5	7,5		A closed	BI-N B4B210	ES	24219211	○
460	490	54	7,5		B open	BI-N B4B210	ES	24218614	○
460	490	54	7,5		B closed	BI-N B4B210	ES	24218792	○
460	490	60	7,5		A open	BI-N B4B210	ES	24219034	○
460	490	60	7,5		A closed	BI-N B4B210	ES	24219212	○
460	490	61,5	7,5		B open	BI-N B4B210	ES	24218615	○
460	490	61,5	7,5		B closed	BI-N B4B210	ES	24218793	○
460	500	60	10		A closed	BI-N B4B210	ES	24235023	○
460	500	60	10		A open	BI-N B4B210	ES	24355016	○
460	500	70	10		A open	BI-N B4B210	ES	24219035	○
460	500	70	10		A closed	BI-N B4B210	ES	24219213	○
460	500	71,5	10		B open	BI-N B4B210	ES	24135172	○
460	500	71,5	10		B closed	BI-N B4B210	ES	24148439	○
460	500	79	10		A closed	BI-N B4B210	ES	24138356	○
460	500	79	10		A open	BI-N B4B210	ES	24219036	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	C	Housing	Type	Material	Type	Article No.	
460	500	80	10		A open	BI-N B4B210	ES	24219037	○
460	500	80	10		A closed	BI-N B4B210	ES	24219214	○
460	500	80,5	10		B open	BI-N B4B210	ES	24218616	○
460	500	80,5	10		B closed	BI-N B4B210	ES	24218794	○
460	500	81,5	10		B closed	BI-N B4B210	ES	24076722	○
460	500	81,5	10		B open	BI-N B4B210	ES	24188047	○
460	500	89	10		A closed	BI-N B4B210	ES	24079459	○
460	500	89	10		A open	BI-N B4B210	ES	24219038	○
460	500	90,5	10		B open	BI-N B4B210	ES	24218617	○
460	500	90,5	10		B closed	BI-N B4B210	ES	24218795	○
470	500	52,5	7,5		A open	BI-N B4B210	ES	24219043	○
470	500	54	7,5		B open	BI-N B4B210	ES	24218622	○
470	500	60	7,5		A closed	BI-N B4B210	ES	24114088	○
470	500	61,5	7,5		B open	BI-N B4B210	ES	24218623	○
470	500	61,5	7,5		B closed	BI-N B4B210	ES	24218799	○
470	510	60	10		A closed	BI-N B4B210	ES	24077623	○
470	510	60	10		A open	BI-N B4B210	ES	24328827	○
470	510	61,5	10		B closed	BI-N B4B210	ES	24261800	○
470	510	70	10		A closed	BI-N B4B210	ES	24086461	○
470	510	71,5	10		B open	BI-N B4B210	ES	24218624	○
470	510	71,5	10		B closed	BI-N B4B210	ES	24218800	○
470	510	79	10		A open	BI-N B4B210	ES	24219046	○
470	510	79	10		A closed	BI-N B4B210	ES	24219219	○
470	510	80	10		A closed	BI-N B4B210	ES	24086152	○
470	510	80	10		A open	BI-N B4B210	ES	24102327	○
470	510	80,5	10		B open	BI-N B4B210	ES	24218625	○
470	510	80,5	10		B closed	BI-N B4B210	ES	24218801	○
470	510	81,5	10		B closed	BI-N B4B210	ES	24073484	○
470	510	81,5	10		B open	BI-N B4B210	ES	24218626	○
470	510	89	10		A closed	BI-N B4B210	ES	24219220	○
470	510	90,5	10		B open	BI-N B4B210	ES	24218627	○
470	510	90,5	10		B closed	BI-N B4B210	ES	24218802	○
470	520	102	12,5		B open	BI-N B4B210	ES	24195501	○
475	505	61,5	7,5		B open	BI-N B4B210	ES	24350425	○
475	515	61,5	10		B open	BI-N B4B210	ES	24266457	○
475	515	71,5	10		B open	BI-N B4B210	ES	24191587	○
475	515	81,5	10		B open	BI-N B4B210	ES	24076698	○
480	510	52,5	7,5		A open	BI-N B4B210	ES	24219048	○
480	510	54	7,5		B open	BI-N B4B210	ES	24218628	○
480	510	60	7,5		A open	BI-N B4B210	ES	24219049	○
480	510	61,5	7,5		B open	BI-N B4B210	ES	24218629	○
480	520	60	10		A closed	BI-N B4B210	ES	24067704	○
480	520	61,5	10		B closed	BI-N B4B210	ES	24234854	○
480	520	70	10		A closed	BI-N B4B210	ES	24105043	○
480	520	70	10		A open	BI-N B4B210	ES	24219050	○
480	520	71,5	10		B open	BI-N B4B210	ES	24088276	○
480	520	71,5	10		B closed	BI-N B4B210	ES	24218803	○
480	520	79	10		A open	BI-N B4B210	ES	24219051	○
480	520	79	10		A closed	BI-N B4B210	ES	24219221	○
480	520	80	10		A closed	BI-N B4B210	ES	24073331	○

● Available from stock ○ On request: Tool is available, delivery at short notice

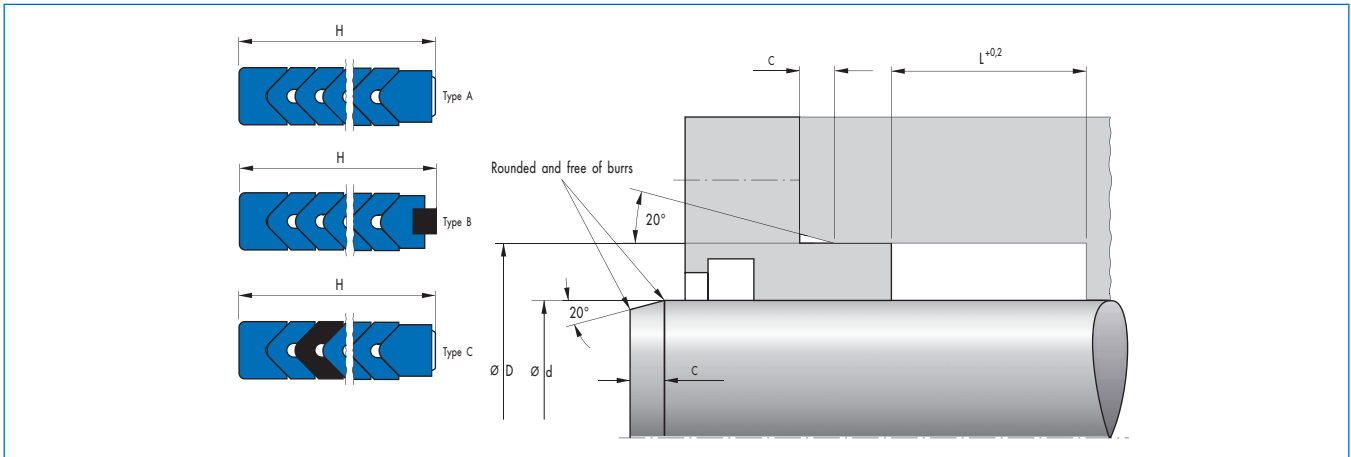


d	D	L	C	Housing	Type	Material	Type	Article No.	
480	520	80	10		A open	BI-N B4B210	ES	24219052	○
480	520	80,5	10		B open	BI-N B4B210	ES	24218630	○
480	520	80,5	10		B closed	BI-N B4B210	ES	24218804	○
480	520	81,5	10		B open	BI-N B4B210	ES	24083647	○
480	520	81,5	10		B closed	BI-N B4B210	ES	24097319	○
480	520	89	10		A open	BI-N B4B210	ES	24219053	○
480	520	89	10		A closed	BI-N B4B210	ES	24219222	○
480	520	90,5	10		B open	BI-N B4B210	ES	24218631	○
480	520	90,5	10		B closed	BI-N B4B210	ES	24218805	○
490	520	52,5	7,5		A open	BI-N B4B210	ES	24219054	○
490	520	54	7,5		B open	BI-N B4B210	ES	24218632	○
490	520	60	7,5		A open	BI-N B4B210	ES	24219055	○
490	520	61,5	7,5		B open	BI-N B4B210	ES	24149532	○
490	530	70	10		A open	BI-N B4B210	ES	24219056	○
490	530	71,5	10		B open	BI-N B4B210	ES	24218633	○
490	530	71,5	10		B closed	BI-N B4B210	ES	24218806	○
490	530	79	10		A open	BI-N B4B210	ES	24219057	○
490	530	80	10		A open	BI-N B4B210	ES	24219058	○
490	530	80,5	10		B open	BI-N B4B210	ES	24218634	○
490	530	80,5	10		B closed	BI-N B4B210	ES	24218807	○
490	530	81,5	10		B open	BI-N B4B210	ES	24077972	○
490	530	81,5	10		B closed	BI-N B4B210	ES	24218808	○
490	530	89	10		A open	BI-N B4B210	ES	24219059	○
490	530	90,5	10		B open	BI-N B4B210	ES	24218635	○
490	530	90,5	10		B closed	BI-N B4B210	ES	24218809	○
500	530	54	7,5		B open	BI-N B4B210	ES	24135092	○
500	540	60	10		A closed	BI-N B4B210	ES	24073680	○
500	540	60	10		A open	BI-N B4B210	ES	24289408	○
500	540	61,5	10		B closed	BI-N B4B210	ES	24101974	○
500	540	70	10		A closed	BI-N B4B210	ES	24078095	○
500	540	70	10		A open	BI-N B4B210	ES	24219060	○
500	540	71,5	10		B open	BI-N B4B210	ES	24071463	○
500	540	71,5	10		B closed	BI-N B4B210	ES	24122836	○
500	540	79	10		A open	BI-N B4B210	ES	24219061	○
500	540	79	10		A closed	BI-N B4B210	ES	24219223	○
500	540	80	10		A open	BI-N B4B210	ES	24069526	○
500	540	80	10		A closed	BI-N B4B210	ES	24075177	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	C	Housing	Type	Material	Type	Article No.	
500	540	80,5	10		B open	BI-N B4B210	ES	24218636	○
500	540	80,5	10		B closed	BI-N B4B210	ES	24232446	○
500	540	81,5	10		B closed	BI-N B4B210	ES	24084839	○
500	540	81,5	10		B open	BI-N B4B210	ES	24089167	○
500	540	89	10		A open	BI-N B4B210	ES	24219062	○
500	540	89	10		A closed	BI-N B4B210	ES	24219224	○
500	540	90,5	10		B open	BI-N B4B210	ES	24218637	○
500	540	90,5	10		B closed	BI-N B4B210	ES	24218810	○
500	550	100	12,5		A open	BI-N B4B210	ES	24219064	○
500	550	102	10		B closed	BI-N B4B210	ES	24021863	○
510	550	61,5	10		B open	BI-N B4B210	ES	24124812	○
510	550	70	10		A open	BI-N B4B210	ES	24111575	○
510	550	70	10		A closed	BI-N B4B210	ES	24266458	○
510	550	71,5	10		B open	BI-N B4B210	ES	24087359	○
510	550	81,5	10		B closed	BI-N B4B210	ES	24287922	○
510	560	100	12,5		A closed	BI-N B4B210	ES	24082070	○
510	560	100	12,5		A open	BI-N B4B210	ES	24219068	○
510	560	102	12,5		B closed	BI-N B4B210	ES	24124279	○
510	560	102	12,5		B open	BI-N B4B210	ES	24218642	○
520	550	60	7,5		A open	BI-N B4B210	ES	24246917	○
520	560	61,5	10		B open	BI-N B4B210	ES	24250502	○
520	560	70	10		A open	BI-N B4B210	ES	24219069	○
520	560	71,5	10		B open	BI-N B4B210	ES	24098086	○
520	560	80	10		A open	BI-N B4B210	ES	24080048	○
520	560	81,5	10		B open	BI-N B4B210	ES	24096048	○
520	570	100	12,5		A open	BI-N B4B210	ES	24183857	○
520	570	102	12,5		B open	BI-N B4B210	ES	24218644	○
525	565	81,5	10		B open	BI-N B4B210	ES	24147763	○
530	570	60	10		A closed	BI-N B4B210	ES	24214284	○
530	570	70	10		A open	BI-N B4B210	ES	24219071	○
530	570	70	10		A closed	BI-N B4B210	ES	24219226	○
530	570	71,5	10		B open	BI-N B4B210	ES	24109362	○
530	570	71,5	10		B closed	BI-N B4B210	ES	24218812	○
530	570	80	10		A open	BI-N B4B210	ES	24219072	○
530	570	80	10		A closed	BI-N B4B210	ES	24219227	○
530	570	81,5	10		B open	BI-N B4B210	ES	24071221	○
530	570	81,5	10		B closed	BI-N B4B210	ES	24218813	○
530	580	100	12,5		A closed	BI-N B4B210	ES	24114578	○
530	580	100	12,5		A open	BI-N B4B210	ES	24184291	○
530	580	102	12,5		B closed	BI-N B4B210	ES	24218815	○
535	575	60	10		A open	BI-N B4B210	ES	24339801	○
540	580	60	10		A closed	BI-N B4B210	ES	24145861	○
540	580	61,5	10		B open	BI-N B4B210	ES	24250612	○
540	580	70	10		A open	BI-N B4B210	ES	24219074	○
540	580	70	10		A closed	BI-N B4B210	ES	24219228	○
540	580	71,5	10		B open	BI-N B4B210	ES	24218645	○
540	580	71,5	10		B closed	BI-N B4B210	ES	24218816	○
540	580	80	10		A open	BI-N B4B210	ES	24075336	○
540	580	80	10		A closed	BI-N B4B210	ES	24170936	○
540	580	81,5	10		B open	BI-N B4B210	ES	24076138	○

● Available from stock ○ On request: Tool is available, delivery at short notice

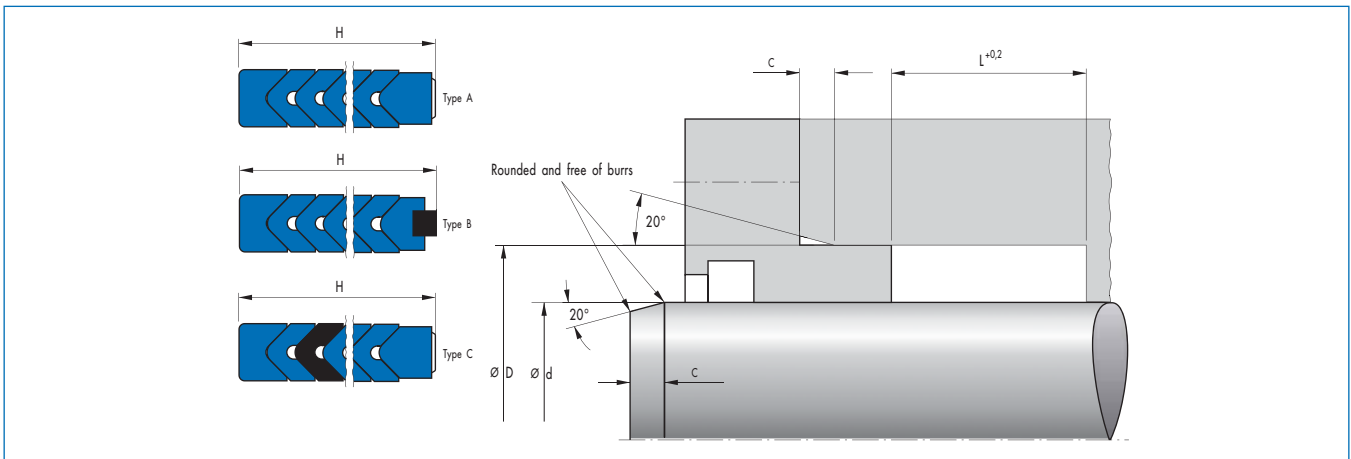


d	D	L	C	Housing	Type	Material	Type	Article No.	
540	580	81,5	10		B closed	BI-N B4B210	ES	24218817	○
540	580	90,5	10		B closed	BI-N B4B210	ES	24251957	○
545	585	81,5	10		B open	BI-N B4B210	ES	24198570	○
550	590	60	10		A closed	BI-N B4B210	ES	24067721	○
550	590	61,5	10		B closed	BI-N B4B210	ES	24146457	○
550	590	70	10		A open	BI-N B4B210	ES	24099983	○
550	590	70	10		A closed	BI-N B4B210	ES	24114443	○
550	590	71,5	10		B open	BI-N B4B210	ES	24093548	○
550	590	71,5	10		B closed	BI-N B4B210	ES	24218818	○
550	590	80	10		A closed	BI-N B4B210	ES	24068523	○
550	590	80	10		A open	BI-N B4B210	ES	24076184	○
550	590	81,5	10		B open	BI-N B4B210	ES	24092719	○
550	590	81,5	10		B closed	BI-N B4B210	ES	24118024	○
555	595	70	10		A open	BI-N B4B210	ES	24219077	○
555	595	70	10		A closed	BI-N B4B210	ES	24219229	○
555	595	71,5	10		B closed	BI-N B4B210	ES	24218819	○
555	595	80	10		A open	BI-N B4B210	ES	24219078	○
555	595	80	10		A closed	BI-N B4B210	ES	24219230	○
555	595	81,5	10		B open	BI-N B4B210	ES	24218647	○
555	595	81,5	10		B closed	BI-N B4B210	ES	24218820	○
560	600	60	10		A closed	BI-N B4B210	ES	24067725	○
560	600	61,5	10		B closed	BI-N B4B210	ES	24146345	○
560	600	70	10		A closed	BI-N B4B210	ES	24079662	○
560	600	70	10		A open	BI-N B4B210	ES	24219079	○
560	600	71,5	10		B open	BI-N B4B210	ES	24079390	○
560	600	71,5	10		B closed	BI-N B4B210	ES	24218821	○
560	600	80	10		A closed	BI-N B4B210	ES	24066933	○
560	600	80	10		A open	BI-N B4B210	ES	24219080	○
560	600	81,5	10		B closed	BI-N B4B210	ES	24064031	○
560	600	81,5	10		B open	BI-N B4B210	ES	24071225	○
560	600	90,5	10		B closed	BI-N B4B210	ES	24244771	○
560	610	100	12,5		A closed	BI-N B4B210	ES	24066944	○
560	610	102	12,5		B closed	BI-N B4B210	ES	24218823	○
570	610	71,5	10		B open	BI-N B4B210	ES	24243007	○
570	610	80	10		A open	BI-N B4B210	ES	24343524	○
570	610	81,5	10		B open	BI-N B4B210	ES	24101408	○
580	620	60	10		A open	BI-N B4B210	ES	24330921	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	C	Housing	Type	Material	Type	Article No.	
580	620	60	10		A closed	BI-N B4B210	ES	24340889	○
580	620	61,5	10		B open	BI-N B4B210	ES	24268708	○
580	620	70	10		A closed	BI-N B4B210	ES	24114437	○
580	620	70	10		A open	BI-N B4B210	ES	24219083	○
580	620	71,5	10		B closed	BI-N B4B210	ES	24218824	○
580	620	71,5	10		B open	BI-N B4B210	ES	24233518	○
580	620	80	10		A closed	BI-N B4B210	ES	24114580	○
580	620	80	10		A open	BI-N B4B210	ES	24145786	○
580	620	81,5	10		B open	BI-N B4B210	ES	24218649	○
580	620	81,5	10		B closed	BI-N B4B210	ES	24218825	○
580	630	100	12,5		A closed	BI-N B4B210	ES	24219231	○
580	630	102	12,5		B open	BI-N B4B210	ES	24107260	○
580	630	102	12,5		B closed	BI-N B4B210	ES	24218827	○
590	630	60	10		A closed	BI-N B4B210	ES	24114340	○
590	630	70	10		A closed	BI-N B4B210	ES	24091257	○
590	630	70	10		A open	BI-N B4B210	ES	24219084	○
590	630	71,5	10		B open	BI-N B4B210	ES	24218651	○
590	630	71,5	10		B closed	BI-N B4B210	ES	24218828	○
590	630	80	10		A closed	BI-N B4B210	ES	24083741	○
590	630	81,5	10		B closed	BI-N B4B210	ES	24009812	○
590	630	81,5	10		B closed	BI-N B4B210	ES	24218829	○
600	630	52,5	7,5		A open	BI-N B4B210	ES	24199064	○
600	640	60	10		A closed	BI-N B4B210	ES	24116145	○
600	640	70	10		A closed	BI-N B4B210	ES	24078738	○
600	640	70	10		A open	BI-N B4B210	ES	24219086	○
600	640	71,5	10		B closed	BI-N B4B210	ES	24063849	○
600	640	71,5	10		B open	BI-N B4B210	ES	24232447	○
600	640	80	10		A closed	BI-N B4B210	ES	24219232	○
600	640	81,5	10		B closed	BI-N B4B210	ES	24068954	○
600	640	81,5	10		B open	BI-N B4B210	ES	24071227	○
600	650	100	12,5		A open	BI-N B4B210	ES	24219089	○
600	650	102	12,5		B open	BI-N B4B210	ES	24132508	○
600	650	102	12,5		B closed	BI-N B4B210	ES	24218831	○
610	650	70	10		A open	BI-N B4B210	ES	24316425	○
610	650	80	10		A open	BI-N B4B210	ES	24222956	○
610	650	81,5	10		B open	BI-N B4B210	ES	24351998	○
620	650	52,5	7,5		A open	BI-N B4B210	ES	24346337	○
620	660	61,5	10		B open	BI-N B4B210	ES	24291254	○
620	660	70	10		A open	BI-N B4B210	ES	24219092	○
620	660	71,5	10		B open	BI-N B4B210	ES	24218655	○
620	660	80	10		A open	BI-N B4B210	ES	24219093	○
620	660	81,5	10		B open	BI-N B4B210	ES	24087689	○
620	670	100	12,5		A open	BI-N B4B210	ES	24219095	○
620	670	102	12,5		B open	BI-N B4B210	ES	24218657	○
630	670	61,5	10		B closed	BI-N B4B210	ES	24064701	○
630	670	61,5	10		B open	BI-N B4B210	ES	24106809	○
630	670	70	10		A open	BI-N B4B210	ES	24084675	○
630	670	70	10		A closed	BI-N B4B210	ES	24219238	○
630	670	71,5	10		B open	BI-N B4B210	ES	24218658	○
630	670	71,5	10		B closed	BI-N B4B210	ES	24218835	○

● Available from stock ○ On request: Tool is available, delivery at short notice

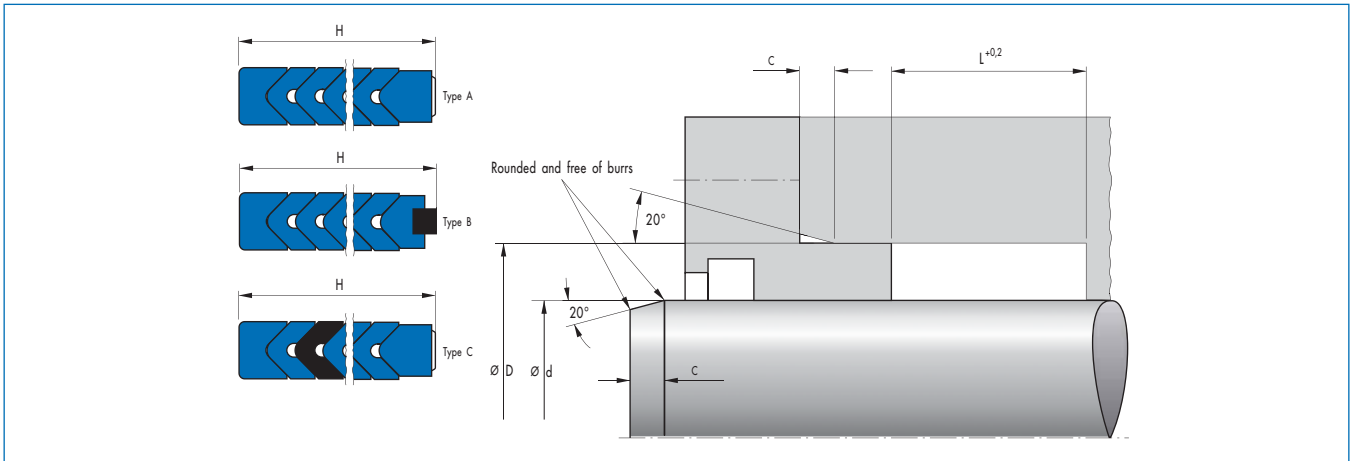


d	D	L	C	Housing	Type	Material	Type	Article No.	
630	670	80	10		A open	BI-N B4B210	ES	24219096	○
630	670	80	10		A closed	BI-N B4B210	ES	24219239	○
630	670	81,5	10		B open	BI-N B4B210	ES	24218659	○
630	670	81,5	10		B closed	BI-N B4B210	ES	24218836	○
630	680	100	12,5		A open	BI-N B4B210	ES	24219098	○
630	680	102	12,5		B open	BI-N B4B210	ES	24218661	○
640	680	70	10		A open	BI-N B4B210	ES	24219099	○
640	680	71,5	10		B open	BI-N B4B210	ES	24218662	○
640	680	80	10		A open	BI-N B4B210	ES	24087777	○
640	680	81,5	10		B open	BI-N B4B210	ES	24218663	○
640	690	100	12,5		A open	BI-N B4B210	ES	24219101	○
640	690	102	12,5		B open	BI-N B4B210	ES	24148978	○
650	690	70	10		A open	BI-N B4B210	ES	24219102	○
650	690	70	10		A closed	BI-N B4B210	ES	24219240	○
650	690	71,5	10		B open	BI-N B4B210	ES	24074106	○
650	690	71,5	10		B closed	BI-N B4B210	ES	24218839	○
650	690	80	10		A open	BI-N B4B210	ES	24081546	○
650	690	80	10		A closed	BI-N B4B210	ES	24172074	○
650	690	81,5	10		B open	BI-N B4B210	ES	24116502	○
650	690	81,5	10		B closed	BI-N B4B210	ES	24218840	○
650	700	100	12,5		A open	BI-N B4B210	ES	24267972	○
660	700	70	10		A open	BI-N B4B210	ES	24219103	○
660	700	71,5	10		B open	BI-N B4B210	ES	24218665	○
660	700	80	10		A open	BI-N B4B210	ES	24219104	○
660	700	81,5	10		B open	BI-N B4B210	ES	24218666	○
660	710	80	12,5		A closed	BI-N B4B210	ES	24197590	○
660	710	100	12,5		A open	BI-N B4B210	ES	24219106	○
660	710	102	12,5		B open	BI-N B4B210	ES	24218668	○
670	710	81,5	10		B open	BI-N B4B210	ES	24071181	○
670	720	100	12,5		A closed	BI-N B4B210	ES	24176117	○
670	720	100	12,5		A open	BI-N B4B210	ES	24219108	○
670	720	102	12,5		B open	BI-N B4B210	ES	24218670	○
670	720	102	12,5		B closed	BI-N B4B210	ES	24218842	○
675	725	100	12,5		A open	BI-N B4B210	ES	24103976	○
680	710	60	7,5		A open	BI-N B4B210	ES	24348073	○
680	720	70	10		A open	BI-N B4B210	ES	24219109	○
680	720	71,5	10		B open	BI-N B4B210	ES	24218671	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	C	Housing	Type	Material	Type	Article No.	
680	720	80	10		A open	BI-N B4B210	ES	24219110	○
680	720	81,5	10		B open	BI-N B4B210	ES	24218673	○
680	730	100	12,5		A open	BI-N B4B210	ES	24219112	○
680	730	102	12,5		B open	BI-N B4B210	ES	24218672	○
685	725	81,5	10		B open	BI-N B4B210	ES	24192820	○
690	730	61,5	10		B closed	BI-N B4B210	ES	24293797	○
690	730	70	10		A open	BI-N B4B210	ES	24219113	○
690	730	70	10		A closed	BI-N B4B210	ES	24219242	○
690	730	71,5	10		B open	BI-N B4B210	ES	24218674	○
690	730	71,5	10		B closed	BI-N B4B210	ES	24218843	○
690	730	80	10		A open	BI-N B4B210	ES	24219114	○
690	730	80	10		A closed	BI-N B4B210	ES	24219243	○
690	730	81,5	10		B open	BI-N B4B210	ES	24109229	○
690	730	81,5	10		B closed	BI-N B4B210	ES	24218844	○
695	735	80	10		A open	BI-N B4B210	ES	24296289	○
700	730	60	7,5		A open	BI-N B4B210	ES	24120063	○
700	740	60	10		A closed	BI-N B4B210	ES	24106925	○
700	740	61,5	10		B open	BI-N B4B210	ES	24193914	○
700	740	70	10		A closed	BI-N B4B210	ES	24078869	○
700	740	70	10		A open	BI-N B4B210	ES	24219115	○
700	740	71,5	10		B open	BI-N B4B210	ES	24103215	○
700	740	71,5	10		B closed	BI-N B4B210	ES	24218845	○
700	740	80	10		A open	BI-N B4B210	ES	24219116	○
700	740	80	10		A closed	BI-N B4B210	ES	24219261	○
700	740	81,5	10		B open	BI-N B4B210	ES	24218675	○
700	740	81,5	10		B closed	BI-N B4B210	ES	24218846	○
700	740	90,5	10		B closed	BI-N B4B210	ES	24239435	○
700	750	100	12,5		A open	BI-N B4B210	ES	24219118	○
700	750	102	12,5		B open	BI-N B4B210	ES	24128272	○
710	750	60	10		A closed	BI-N B4B210	ES	24195814	○
710	750	61,5	10		B closed	BI-N B4B210	ES	24238814	○
710	750	70	10		A closed	BI-N B4B210	ES	24074993	○
710	750	70	10		A open	BI-N B4B210	ES	24219121	○
710	750	71,5	10		B closed	BI-N B4B210	ES	24082443	○
710	750	71,5	10		B open	BI-N B4B210	ES	24218679	○
710	750	80	10		A open	BI-N B4B210	ES	24219122	○
710	750	80	10		A closed	BI-N B4B210	ES	24219245	○
710	750	81,5	10		B open	BI-N B4B210	ES	24071177	○
710	750	81,5	10		B closed	BI-N B4B210	ES	24218849	○
710	750	90,5	10		B closed	BI-N B4B210	ES	24129422	○
710	760	100	12,5		A closed	BI-N B4B210	ES	24114586	○
710	760	100	12,5		A open	BI-N B4B210	ES	24186413	○
710	760	102	12,5		B open	BI-N B4B210	ES	24218680	○
710	760	102	12,5		B closed	BI-N B4B210	ES	24218851	○
720	760	70	10		A open	BI-N B4B210	ES	24219123	○
720	760	71,5	10		B open	BI-N B4B210	ES	24218681	○
720	760	80	10		A open	BI-N B4B210	ES	24187283	○
720	770	100	12,5		A open	BI-N B4B210	ES	24219125	○
720	770	100	12,5		A closed	BI-N B4B210	ES	24219247	○
720	770	102	12,5		B open	BI-N B4B210	ES	24218684	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	L	C	Housing	Type	Material	Type	Article No.	
800	850	70	12,5		A open	BI-N B4B210	ES	24192354	○
800	850	80	12,5		A closed	BI-N B4B210	ES	24067763	○
800	850	82	12,5		B closed	BI-N B4B210	ES	24077894	○
800	850	100	12,5		A closed	BI-N B4B210	ES	24066922	○
800	850	100	12,5		A open	BI-N B4B210	ES	24094794	○
800	850	102	12,5		B closed	BI-N B4B210	ES	24103851	○
800	850	102	12,5		B open	BI-N B4B210	ES	24104080	○
810	850	81,5	10		B open	BI-N B4B210	ES	24353087	○
820	860	71,5	10		B open	BI-N B4B210	ES	24263168	○
820	870	100	12,5		A closed	BI-N B4B210	ES	24114587	○
820	870	100	12,5		A open	BI-N B4B210	ES	24219137	○
820	870	102	12,5		B open	BI-N B4B210	ES	24218694	○
820	870	102	12,5		B closed	BI-N B4B210	ES	24218857	○
825	875	102	12,5		B open	BI-N B4B210	ES	24267024	○
830	880	100	12,5		A open	BI-N B4B210	ES	24342533	○
840	880	81,5	10		B open	BI-N B4B210	ES	24335687	○
840	890	100	12,5		A open	BI-N B4B210	ES	24357980	○
850	890	60	10		A closed	BI-N B4B210	ES	24339224	○
850	890	61,5	10		B closed	BI-N B4B210	ES	24263169	○
850	890	70	10		A closed	BI-N B4B210	ES	24114461	○
850	890	70	10		A open	BI-N B4B210	ES	24219138	○
850	890	71,5	10		B open	BI-N B4B210	ES	24218695	○
850	890	71,5	10		B closed	BI-N B4B210	ES	24218858	○
850	890	80	10		A open	BI-N B4B210	ES	24131119	○
850	890	80	10		A closed	BI-N B4B210	ES	24219250	○
850	890	81,5	10		B closed	BI-N B4B210	ES	24077013	○
850	890	81,5	10		B open	BI-N B4B210	ES	24218696	○
850	900	70	12,5		A closed	BI-N B4B210	ES	24114382	○
850	900	100	12,5		A open	BI-N B4B210	ES	24219140	○
850	900	100	12,5		A closed	BI-N B4B210	ES	24219252	○
850	900	102	12,5		B open	BI-N B4B210	ES	24218698	○
850	900	102	12,5		B closed	BI-N B4B210	ES	24218860	○
860	900	60	10		A open	BI-N B4B210	ES	24359911	○
860	910	102	12,5		B open	BI-N B4B210	ES	24199041	○
870	920	100	12,5		A open	BI-N B4B210	ES	24219142	○
870	920	100	12,5		A closed	BI-N B4B210	ES	24219254	○
870	920	102	12,5		B open	BI-N B4B210	ES	24117560	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	C	Housing	Type	Material	Type	Article No.	
870	920	102	12,5		B closed	BI-N B4B210	ES	24218862	○
875	925	100	12,5		A closed	BI-N B4B210	ES	24101244	○
875	925	102	12,5		B open	BI-N B4B210	ES	24085902	○
880	930	101	12,5		B open	BI-N B4B210	ES	24244245	○
900	940	70	10		A closed	BI-N B4B210	ES	24219257	○
900	940	71,5	10		B closed	BI-N B4B210	ES	24218865	○
900	940	80	10		A closed	BI-N B4B210	ES	24219258	○
900	940	81,5	10		B closed	BI-N B4B210	ES	24218866	○
900	950	100	12,5		A closed	BI-N B4B210	ES	24066945	○
900	950	100	12,5		A open	BI-N B4B210	ES	24219146	○
900	950	102	12,5		B open	BI-N B4B210	ES	24218703	○
900	950	102	12,5		B closed	BI-N B4B210	ES	24218868	○
925	975	100	12,5		A open	BI-N B4B210	ES	24351206	○
930	980	102	12,5		B open	BI-N B4B210	ES	24261784	○
950	1000	91	12,5		B closed	BI-N B4B210	ES	24214711	○
950	1000	100	12,5		A closed	BI-N B4B210	ES	24114590	○
950	1000	100	12,5		A open	BI-N B4B210	ES	24219150	○
950	1000	102	12,5		B open	BI-N B4B210	ES	24218707	○
950	1000	102	12,5		B closed	BI-N B4B210	ES	24218870	○
960	1010	100	12,5		A open	BI-N B4B210	ES	24073190	○
960	1010	102	12,5		B open	BI-N B4B210	ES	24218709	○
975	1015	61,5	10		B open	BI-N B4B210	ES	24263162	○
980	1020	81,5	10		B open	BI-N B4B210	ES	24078616	○
1000	1040	61,5	10		B open	BI-N B4B210	ES	24267847	○
1000	1040	71,5	10		B open	BI-N B4B210	ES	24218710	○
1000	1040	81,5	10		B open	BI-N B4B210	ES	24071280	○
1000	1050	100	12,5		A closed	BI-N B4B210	ES	24114995	○
1000	1050	100	12,5		A open	BI-N B4B210	ES	24219155	○
1000	1050	102	12,5		B closed	BI-N B4B210	ES	24137135	○
1000	1050	102	12,5		B open	BI-N B4B210	ES	24218712	○
1020	1070	102	12,5		B open	BI-N B4B210	ES	24343588	○
1050	1100	100	12,5		A closed	BI-N B4B210	ES	24071553	○
1060	1110	100	12,5		A open	BI-N B4B210	ES	24356608	○
1070	1120	100	12,5		A open	BI-N B4B210	ES	24352076	○
1080	1130	102	12,5		B open	BI-N B4B210	ES	24359160	○
1100	1140	80	10		A open	BI-N B4B210	ES	24098392	○
1100	1150	102	12,5		B open	BI-N B4B210	ES	24122700	○
1130	1170	60	10		A open	BI-N B4B210	ES	24144932	○
1150	1200	70	12,5		A open	BI-N B4B210	ES	24175251	○
1220	1270	100	12,5		A closed	BI-N B4B210	ES	24335019	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Chevron Seal Set made of PTFE

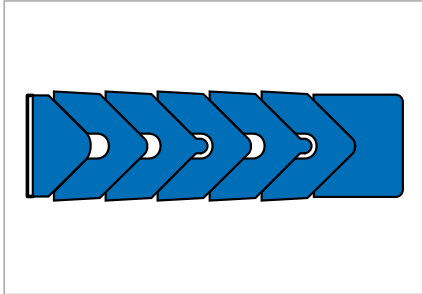


Fig. 1 Chevron Seal Set made of PTFE

Product description

- Proven sealing systems for piston rods, plungers, spindles and slowly rotating shafts
- Sets consisting of pressure ring, chevron seals, back-up ring
- The number of chevron seals in a sealing set depends on the pressure and temperature in the operating range.

Product advantages

- Universal chemical resistance
- High temperature resistance
- Very high resistance to pressure
- Good sliding and lubricating properties
- High wear resistance and dimensional stability
- Very high protection against extrusion.

Application

- Chemistry
 - Pharmaceuticals
 - Measuring and control systems
 - General mechanical engineering
 - Foodstuffs industry
 - Iron and steel industry
- e.g. regulation and shut-off valves, plunger pumps, metering systems, agitators, hydraulic cylinders, rotary joints.

Materials

- PTFE/PTFE compound
- PTFE impregnated plastic fabric.

Operating conditions

Material	PTFE/PTFE compound	PTFE impregnated fabric
Pressure	30 MPa	70 MPa
Linear velocity		
- Continuous operation	0,5 m/s	0,5 m/s
- Intermittent operation	1,2 m/s	0,8 m/s
Temperature	-200 ... +260 °C	-200 ... +260 °C

All operating parameters given are maximum values. Simultaneously occurring maximum loads may require design measures in some circumstances. Please consult our technical advisory service.

Design notes

The dimensions of the housings are given in the lists of dimensions. The housing and the rod or shaft should have lead-in chamfers so that the sealing edges of

the seals are not damaged during fitting. The fits and surface qualities of the metal parts as well as the guide affect the function and service life of the seal sets.

Tolerances

Plunger Ø d	Recommended fit	Housing Ø D
... 80	H9/f8	H8
>80 ... 120	H8/f8	
>120 ... 200	H8/f7	

Surface quality

Surface roughness	ISO roughness parameter	Mean roughness R _a
Contact area	4	0,2
Housing outside Ø	6*	0,8
Housing front faces	8	3,2

* Minimum requirement

Fitting notes

Chevron seal sets made of PTFE PTFE chevron seals have relatively high thermal expansion. The seal set must therefore be elastically retained under load by a spring component. The spring force depends on the type and dimensions of the seal profile. For the profile 9409 a pre-load of 0,2 N/mm² is necessary. For the profiles 9403 and 9406 the pre-load from the spring must be 0,8 N/mm², also for smaller dimensions beyond this figure. The information on the spring forces apply for standard applications.

PTFE impregnated fabric Chevron Seal Set

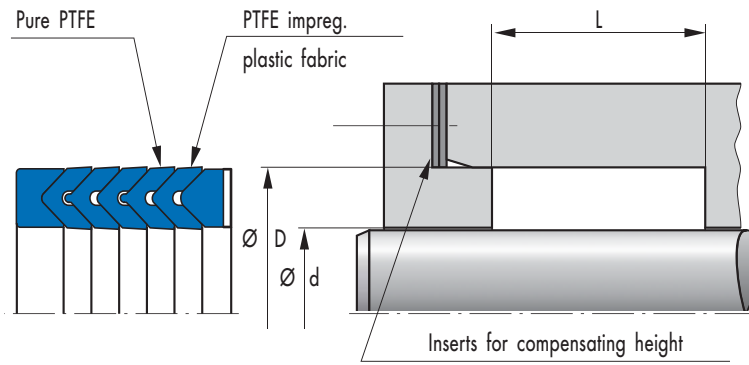
These sets are intended for adjustable housings. As a rule the seal sets are installed without additional spring components.

Recommended Dimensions of the Chevron Seal Sets made of pure PTFE and PTFE Compound

Profile 9409 (single seal)					Profile 9403 (single seal)					Profile 9406 (single seal)										
Article list					0971					0987	0986	0985					0980	0979	0978	0977
B	E	K	M _{min}	L*	E	K	M _{min}	L*				E	K	M _{min}	L*					
				3				3	4	5					2	3	4	5		
4	2,7	2,7	4	15	2,4	2,4	3,5	14	16	18	2,6	2,4	3,5	12	14	17	19			
5	3,4	3,4	4,6	19	3	2,4	4	16	19	22	3,3	3	4	14	17	21	24			
6	4,1	4,1	5	22	3,5	3,5	4,4	19	22	26	3,9	3,5	4,4	16	20	24	28			
7,5	5,1	5,1	5,6	26	4	4	5,1	22	26	30	4,9	4	5,1	19	24	29	34			
10	6,8	6,8	7	35	5	5	6,1	27	32	37	6,5	5	6,1	25	31	38	44			
12,5	8,5	8,5	8,2	43	6	6	7,2	32	38	44	8,1	6	7,2	30	38	46	54			
15	10,2	10,2	9,7	51	7,5	7,5	8,1	39	46	54	9,8	7,5	8,1	36	45	55	65			

* for number of seals.

Article list



d	D	L	Material	Article No.	
20	32	27	MAI-C9T003	24293250	○
22	34	27	MAI-C9T003	24293251	○
25	40	27	MAI-C9T003	24293252	○
28	43	27	MAI-C9T003	24293253	○
30	45	27	MAI-C9T003	24293254	○
32	47	27	MAI-C9T003	24293255	○
35	50	27	MAI-C9T003	24293256	○
36	51	27	MAI-C9T003	24293257	○
40	55	27	MAI-C9T003	24293258	○
45	65	31	MAI-C9T003	24293259	○
50	70	31	MAI-C9T003	24293260	○
55	75	45	MAI-C9T003	24293261	○
56	76	45	MAI-C9T003	24293262	○
60	80	45	MAI-C9T003	24293263	○
65	85	45	MAI-C9T003	24293265	○
70	90	45	MAI-C9T003	24293266	○
75	95	45	MAI-C9T003	24293267	○
80	100	45	MAI-C9T003	24293268	○
85	105	45	MAI-C9T003	24293269	○
90	110	45	MAI-C9T003	24293270	○
100	120	45	MAI-C9T003	24293271	○
125	150	52	MAI-C9T003	24293273	○
140	165	52	MAI-C9T003	24293274	○
150	180	67	MAI-C9T003	24293275	○
160	190	67	MAI-C9T003	24293276	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Packing Ring TFW made of PTFE

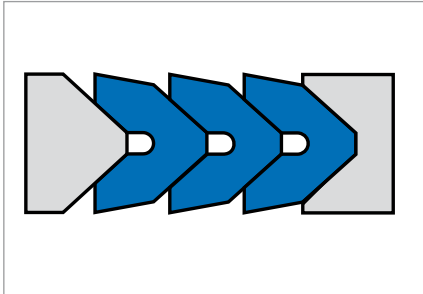


Fig. 1 Merkel Packing Ring TFW made of PTFE

Product description

V-shape sealing ring made of PTFE for making up packings, comprising:

- 1 saddle ring TFS
- 3 to 5 angled rings TFW
- 1 mating ring TFG.

Note:

Only TFW rings are available from stock. Complete packings are only available on request.

Product advantages

Packing rings TFW feature very good chemical and thermal resistance, low friction and favourable breakaway forces even after long periods of down-time.

Application

Packing rings TFW are suitable for axially operated valve spindles, rods and plungers, as well as slowly turning shafts.

Material

Saddle ring	Angled ring	Mating ring
PTFE on request Metal (customer solution)	PTFE 15/F52902 (graphite-filled PTFE)	PTFE on request Metal (customer solution)

→ Technical Manual.

Operating conditions

Pressure	Temperature
31,5 MPa	-200 ... +220 °C

Running speed	on axial movement	on rotary movement
Continuous operation	approx. 0,5 m/s	approx. 0,2 m/s
Intermittent operation	approx. 1,5 m/s	approx. 0,4 m/s

Fitting & installation

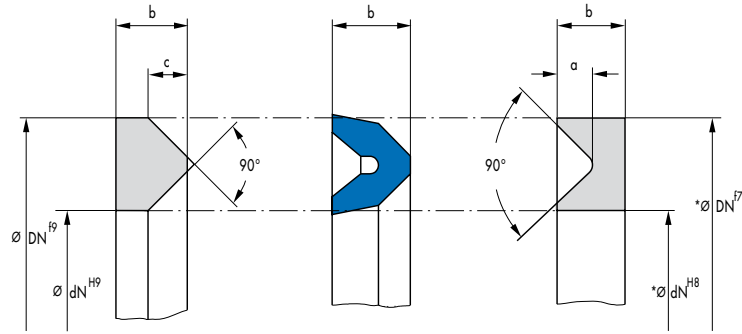
With fluctuating operating temperatures or when sealing a rotating shaft, the packing is to be pre-loaded with 1,5 to 2 N/mm² on the pressure side using a spring. If the spring must be installed on the non-pressurised side then its pre-load is to be matched to the maximum

pressure that occurs. If metal saddle and mating rings are manufactured by the customer, the dimensions are to be taken from the table. The number of PTFE angled rings depends on the pressure of the medium.

We recommend:

p ≤ 3 MPa	p > 3 ... 10 MPa	p > 10 MPa
3 TFW	4 TFW	5 TFW

List of dimensions



* = tolerances only apply for metal design

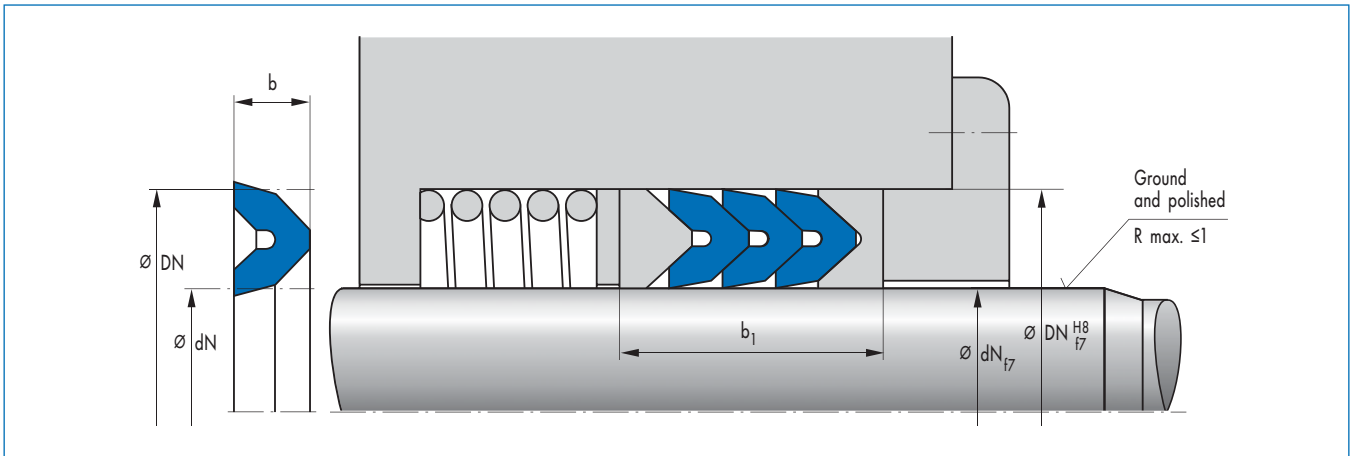
Ø Difference DN-dN	Mating ring TFG ¹⁾		Angled ring TFW	Saddle ring TFS ¹⁾		Packing height	
	b	a	b	b	c	b ₁ ²⁾	Δh ³⁾
8	4,0	1,4	3,8	4,0	1,7	15,3	2,9
10	4,5	1,8	4,8	4,5	2,1	17,8	3,6
12	5,0	2,1	5,8	5,0	2,5	20,3	4,2
15	6,0	2,6	7,0	6,0	3,1	23,5	4,7
20	7,5	3,4	9,3	7,5	4,3	29,6	6,0
25	9,0	4,5	11,2	9,0	5,4	33,7	6,8
30	10,5	5,5	13,0	10,5	6,3	38,4	7,7

¹⁾ TFS/TFG available on request

²⁾ Height with 3 TFW

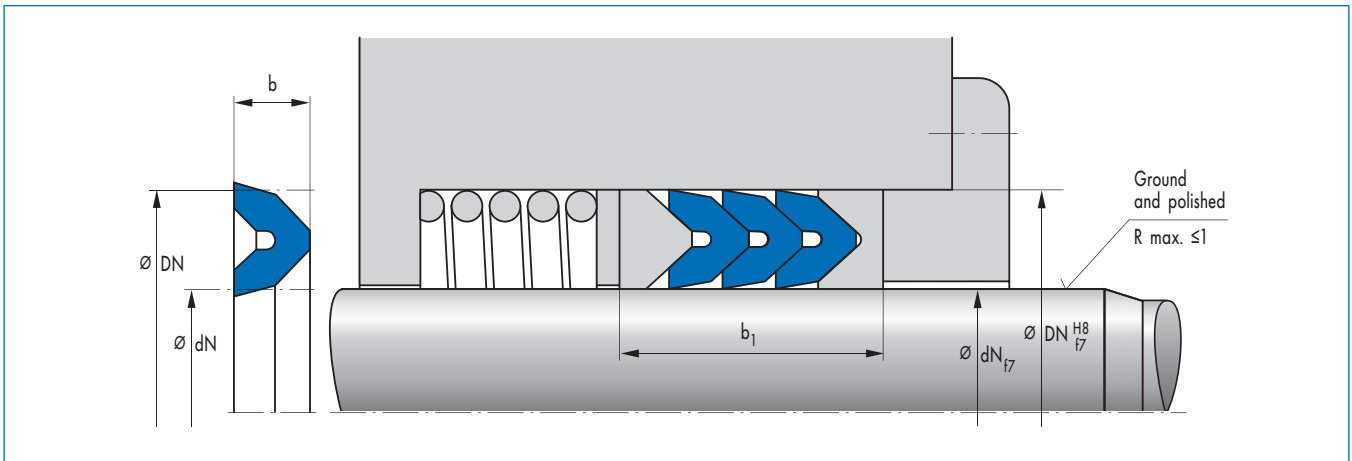
³⁾ Height increase for each additional angled ring TFW

Article list



d _N	D _N	b	Material	Article No.	
5	17	5,8	PTFE F52902	96598	●
6	14	3,8	PTFE F52902	97294	●
6	18	5,8	PTFE F52902	97913	●
8	16	3,8	PTFE F52902	88	●
8	20	5,8	PTFE F52902	35714	●
10	18	3,8	PTFE F52902	97384	●
10	22	5,8	PTFE F52902	110099	○
12	20	3,8	PTFE F52902	94496	●
12	24	5,8	PTFE F52902	35209	●
13	25	5,8	PTFE F52902	97392	●
15	27	5,8	PTFE F52902	38486	●
16	24	3,8	PTFE F52902	97393	○
16	28	5,8	PTFE F52902	96617	●
20	28	3,8	PTFE F52902	92	●
20	32	5,8	PTFE F52902	95	●
22	34	5,8	PTFE F52902	98944	●
22	34	5,8	PTFE F52902	49019518	○
23	35	5,8	PTFE F52902	38931	○
25	37	5,8	PTFE F52902	98945	●
26	41	7	PTFE F52902	147	○
30	42	5,8	PTFE F52902	99578	○
30	50	9,3	PTFE F52902	35699	●
34	46	5,8	PTFE F52902	39032	○
35	47	5,8	PTFE F52902	39047	●
35	50	7	PTFE F52902	39060	●
36	48	5,8	PTFE F52902	36086	●
38	58	9,3	PTFE F52902	39074	●
40	52	5,8	PTFE F52902	39160	●
40	65	11,2	PTFE F52902	39171	○
45	60	7	PTFE F52902	34161	●
45	65	9,3	PTFE F52902	182	○
48	68	9,3	PTFE F52902	39313	○
50	62	5,8	PTFE F52902	39315	○
50	70	9,3	PTFE F52902	186	○
50	80	13	PTFE F52902	266	○
52	64	5,8	PTFE F52902	39318	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d_N	D_N	b	Material	Article No.	
55	67	5,8	PTFE F52902	208	○
60	80	9,3	PTFE F52902	34245	●
60	85	11,2	PTFE F52902	39326	○
65	85	9,3	PTFE F52902	12462	○
65	90	11,2	PTFE F52902	110662	●
70	82	5,8	PTFE F52902	39330	○
85	105	9,3	PTFE F52902	37457	●
100	125	11,2	PTFE F52902	99462	○
115	135	9,3	PTFE F52902	236	○
130	155	11,2	PTFE F52902	34138	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel V-Packings V 1000

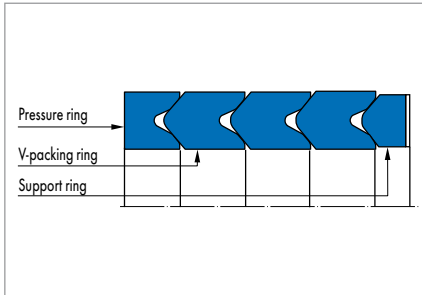


Fig. 1 Merkel V-Packings V 1000

Product description

Merkel V-packings are used for sealing piston rods, plungers and in exceptional cases of pistons. With their robust design they are very suitable for use in highly demanding, heavy and horizontal compressors, particularly if the plungers are subject to large side forces. V-packings can even be used if piston rods or plungers cannot be correctly used because of wear. V-packing in connection with fabric pressure and back-up rings are used primarily in heavy-duty hydraulics because they can easily be tightened at any time and their robust design. V-packing rings are supplied open for nominal diameter up to an inside diameter of 400 mm. For larger diameters the rings are overdimensioned in length, and they must be precisely fitted during fitting into the compression packing. If required endless rings can also be supplied. If no information on the version, the fluid or temperature is given, B/B (see Operating parameters range table) is delivered as the standard version.

Application

Heavy machinery manufacture, iron and steel technology, scrap shears, manipulators.

Material

Pressure ring

Material	Code
Natural rubber	BI-NR B5A151 (B/A)
Natural rubber	BI-NR B5B210 (B/B)

Operating conditions

Material	BI-NR B6B210/BI-NR B6B210 (B/B)
Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +100
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100

Surface quality

Surface roughness	R _a	R _{max}
Contact area	0,4 µm	≤4 µm
Outer housing Ø	≤1,8 µm	≤10 µm
Housing end face	≤3,0 µm	≤16 µm

Design notes

Please observe our general design notes.

Determination of the housing

The dimensions of the V-packings 1000 are listed below. Sufficient dimensioning is very important for the operating safety and service life of the seal, because if the section widths are too small may result in difficulty in operation and lower service life. We recommend the profile widths listed in the table in association with the nominal diameter.

Nominal Ø d	Profile width B
... 25	7,5
>25 ... 80	10,0
>80 ... 120	12,5
>120 ... 250	15,0
>250 ... 500	20,0
>500 ... 1000	25,0
>1000	30,0

V-packings are supplied with a plus tolerance in the height. The housings must therefore be adjustable in the axial direction. The number and height of the washers under the gland depends on the section width and therefore also the height of the set. For the recommended minimum tightening dimension z and the recommended lead-in chamfers see the table.

Profile width B	7,5	10	12,5	15	20	25	30
≤500	4	8,0	10,0	12	15,0	20	30
>500	5	6,5	7,5	10	12,5	15	15

Fits

Diameter	Clearance fit	Housing diameter D
... 80	H9/f8	H11
>80 ... 120	H8/f8	
>120 ... 500	H8/e8	
>500 ... 630	450 µm	H10
>630 ... 800	500 µm	
>800 ... 1000	550 µm	
>1000 ... 1250	700 µm	
>1250 ... 1600	750 µm	
>1600 ... 1800	850 µm	
>1800	950 µm	

To achieve the desired sealing effect with open or cut seal sets, the circumference length must be greater than the length calculated from the nominal diameter. The specific added length enables the required pressing at the joint sections.

V-packings with a nominal diameter of up to 400 mm

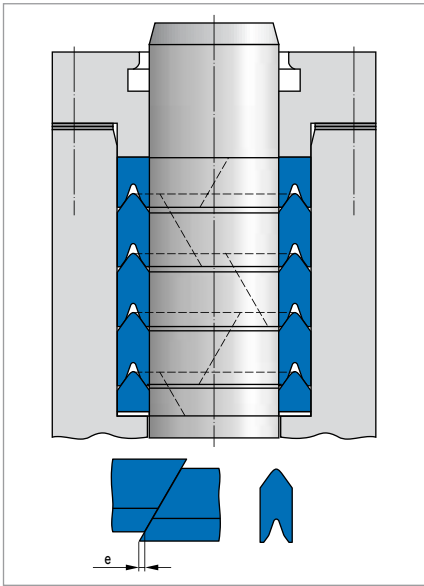
These packings have correct assembly dimensions. They can be installed without any further advance preparation.

V-packings with a nominal diameter of more than 400 mm

If the packings are to be stored for very long periods and are subject to a wide variety of environmental influences, changes in the circumference length may occur. Therefore, these sizes are always supplied with extra overlength. The packings over 400 mm in nominal diameter must therefore be trimmed to the required size immediately before fitting: nominal length of circumference plus extra length "e" in accordance with the table. This table is applicable for the seals and pressure rings. The support rings are cut blunt so they have a gap of 1 to 5 mm when centred in the seal. Any plastic back-up rings included in the seal set are trimmed diagonally to fit exactly.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal. On fitting every ring is individually inserted into the sealing area at multiple points - with the joint sections first. In this regard the joint sections take the "position after installation" shown in the illustration and should be positioned offset 120° from ring to ring, as shown in the illustration. Before fitting the seals must be greased. The use of neutral, compatible greases is beneficial. This grease substantially reduces the friction and makes the assembly easier. When tightening the gland all rings of the seal set are brought to the final position.

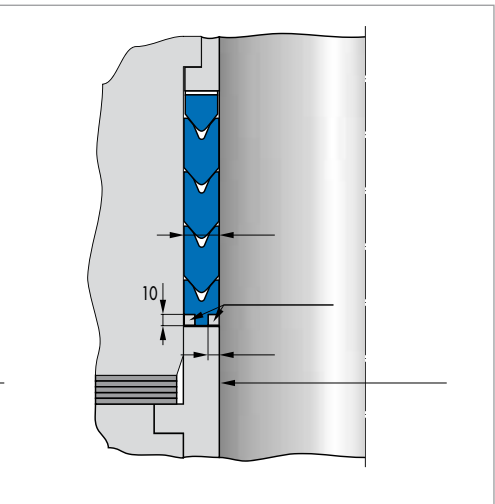
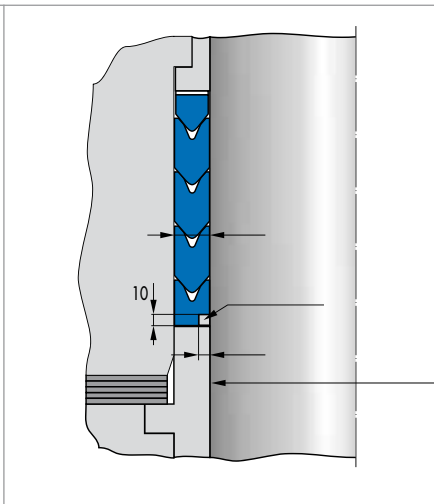
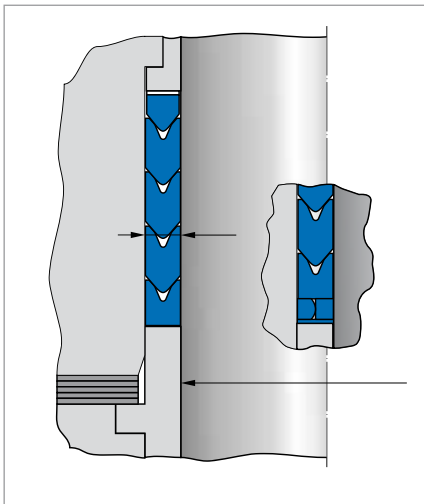


$\varnothing d$	Added length
200 ... 250	7
>250 ... 500	9
>500 ... 750	12
>750 ... 1000	15
>1000 ... 1500	20
>1500 ... 2000	25

Special designs with anti-extrusion rings (back-up rings)

For new designs

For repairs (greater play for fitting)

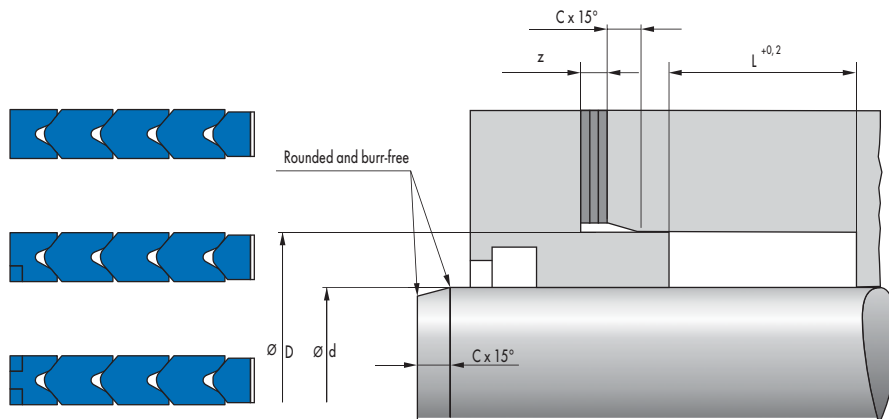


Open
 B 25 \varnothing 400 ... 3000;
 other dimensions on enquiry.
 B 30 \varnothing 650 ... 3000;
 other dimensions on enquiry.

Open
 \varnothing 650 ... 3000;
 over \varnothing 3000 on enquiry.

Open
 B 27,5 \varnothing 720 ... 3000;
 over \varnothing 3000 on enquiry.
 B 30 \varnothing 650 ... 3000;
 over \varnothing 3000 on enquiry.

Article list

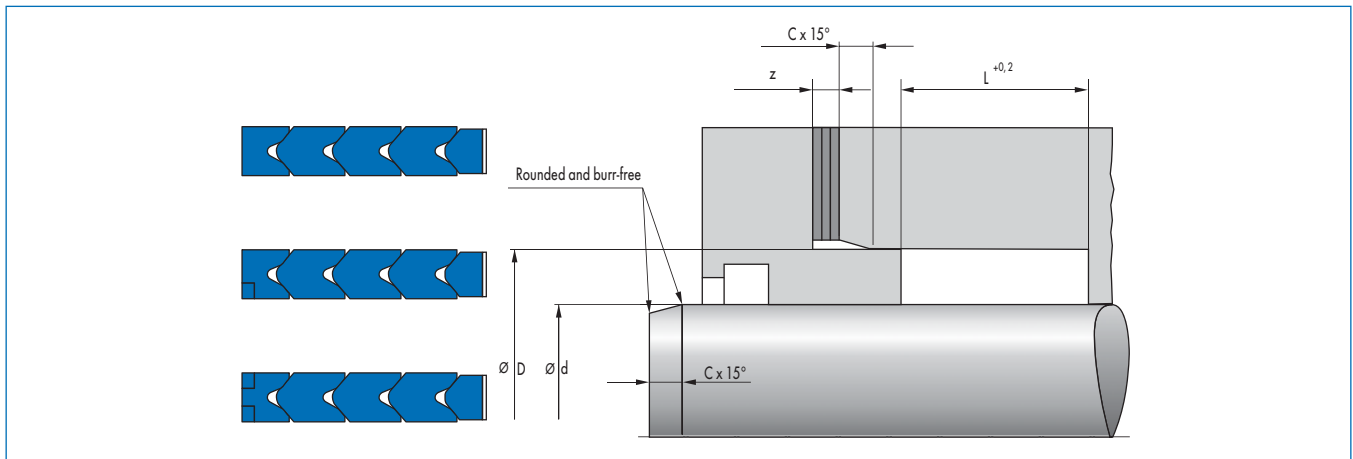


d	D	H	C	Profile	Material	Article No.	
100	125	88	7,5	12,5	BI-N B5B210	24083925	○
100	125	110	7,5	12,5	BI-N B5A151	24230657	○
100	125	110	7,5	12,5	BI-N B5B210	24071835	○
100	130	92	10	15	BI-N B5B210	24368364	○
100	130	93,5	10	15	BI-N B5B210	24071247	○
100	130	100	10	15	BI-N B5B210	49002506	○
100	130	100	10	15	BI-N B5B210	24089315	○
100	130	120	10	15	BI-N B5A151	24374838	○
100	130	120	10	15	BI-N B5B210	24085541	○
101,6	126,6	101,6	7,5	12,5	BI-N B5A151	24083638	○
101,6	133,4	123,8	10	15,9	BI-N B5A151	24316463	○
105	130	88	7,5	12,5	BI-N B5B210	24099643	○
105	135	120	10	15	BI-N B5A151	24192352	○
110	130	75	6,5	10	BI-N B5B210	24191261	○
110	135	97,6	7,5	12,5	BI-N B5B210	24077738	○
110	135	98,5	7,5	12,5	BI-N B5A151	24071540	○
110	140	95	10	15	BI-N B5B210	24073933	○
110	140	100	10	15	BI-N B5B210	24075948	○
110	140	145	10	15	BI-N B5B210	24363205	○
114,3	139,3	105	7,5	12,5	BI-N B5A151	24256650	○
115	145	95	10	15	BI-N B5B210	24147044	○
115	145	120	10	15	BI-N B5B210	24096333	○
120	150	118,5	10	15	BI-N B5B210	24087474	○
120	150	120	10	15	BI-N B5A151	24105125	○
120	150	128	10	15	BI-N B5B210	24089351	○
120,7	152,4	123,8	10	15,85	BI-N B5A151	24183246	○
123	155	95	10	16	BI-N B5B210	24112532	○
125	150	98,5	7,5	12,5	BI-N B5A151	24074297	○
125	150	98,5	7,5	12,5	BI-N B5A151	24373658	○
125	150	98,5	7,5	12,5	BI-N B5B210	24081714	○
125	155	95	10	15	BI-N B5A151	24089158	○
125	155	95	10	15	BI-N B5B210	24072133	○
125	155	95	10	15	BI-N B5B210	24075731	○
125	155	117,4	10	15	BI-N B5B210	24064543	○
125	155	120	10	15	BI-N B5B210	24079394	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
125	155	120	10	15	BI-N B5B210	24079853	○
125	165	158	12,5	20	BI-N B6A151	24129451	○
130	160	118,5	10	15	BI-N B5B210	24103497	○
130	160	150	10	15	BI-N B5B210	24216258	○
130	170	158	12,5	20	BI-N B6A151	527666	○
133,4	158,4	98,5	7,5	12,5	BI-N B5A151	24080602	○
133,4	165,4	128	10	16	BI-N B5A151	24140755	○
135	165	95	10	15	BI-N B5B210	24259745	○
135	175	126	12,5	20	BI-N B6B210	24074448	○
139,7	171,7	120	10	16	BI-N B5A151	24080466	○
139,7	171,7	128	10	16	BI-N B5A151	24235741	○
140	165	76,5	7,5	12,5	BI-N B5A151	24239124	○
140	165	98,5	7,5	12,5	BI-N B5A151	24086537	○
140	165	100	7,5	12,5	BI-N B5B210	24081710	○
140	165	102	7,5	12,5	BI-N B5A151	24140697	○
140	170	93	10	15	BI-N B5B210	24067777	○
140	170	95	10	15	BI-N B5B210	24102051	○
140	170	95	10	15	BI-N B5B210	24141626	○
140	170	100	10	15	BI-N B5B210	24073934	○
140	170	120	10	15	BI-N B5B210	24073931	○
140	170	122	10	15	BI-N B5A151	24123130	○
140	170	131	10	15	BI-N B5A151	24373175	○
140	170	140,5	10	15	BI-N B5A151	24342149	○
140	170	150	10	15	BI-N B5B210	24261010	○
145	175	117,4	10	15	BI-N B5B210	24067697	○
145	175	118,5	10	15	BI-N B5B210	24131644	○
146,1	171,5	104,7	7,5	12,7	BI-N B5B210	24143944	○
150	180	100	10	15	BI-N B5A151	24072331	○
150	180	100	10	15	BI-N B5B210	24086426	○
150	180	100	10	15	BI-N B5B210	24144999	○
150	180	120	10	15	BI-N B5A151	24092789	○
150	180	150	10	15	BI-N B5B210	24103411	○
150	188,1	127,1	12,5	19,05	BI-N B6A151	24363071	○
150	190	158	12,5	20	BI-N B6B210	24105019	○
150	190	190	12,5	20	BI-N B6B210	24082060	○
152,4	177,8	104,7	7,5	12,7	BI-N B5A151	24098595	○
158	190	93,5	10	16	BI-N B5B210	24120867	○
158,8	190,8	127,5	10	16	BI-N B5A151	24103260	○
160	190	95	10	15	BI-N B5A151	24102041	○
160	190	95	10	15	BI-N B5A151	24178280	○
160	190	95	10	15	BI-N B5B210	24074695	○
160	190	95	10	15	BI-N B5B210	24095014	○
160	190	97	10	15	BI-N B5B210	24100394	○
160	190	120	10	15	BI-N B5B210	24076192	○
160	190	120	10	15	BI-N B5B210	24083991	○
160	190	122	10	15	BI-N B5A151	24095656	○
160	190	122	10	15	BI-N B5B210	24076149	○
160	190	128	10	15	BI-N B5A151	24231977	○
160	190	145	10	15	BI-N B5B210	24127917	○
160	192	120	10	16	BI-N B5A151	24101219	○

● Available from stock ○ On request: Tool is available, delivery at short notice

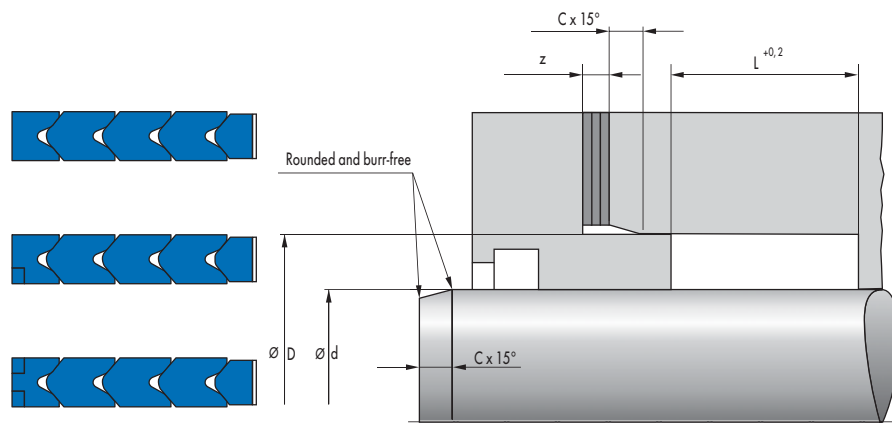


d	D	H	C	Profile	Material	Article No.	
160	192	120	10	16	BI-N B5B210	24077698	○
165	195	99	10	15	BI-N B5B210	24178047	○
165	200	121,5	12,5	17,5	BI-N B5B210	24144903	○
165	205	144	12,5	20	BI-N B6B210	24104897	○
165,1	197,1	129,6	10	16	BI-N B5A151	24093302	○
166	206	112	12,5	20	BI-N B6A151	527301	○
168	198	124	10	15	BI-N B5B210	24338674	○
169,9	201,6	127,1	10	15,85	BI-N B5A151	24241830	○
170	200	99	10	15	BI-N B5A151	24268170	○
170	200	99	10	15	BI-N B5B210	24124025	○
170	200	124	10	15	BI-N B5A151	24106384	○
170	200	124	10	15	BI-N B5B210	24067987	○
170	210	176	12,5	20	BI-N B6A151	24368331	○
171,5	196,9	126,9	7,5	12,7	BI-N B5A151	24105616	○
171,5	203,5	116,8	10	16	BI-N B5A151	24222691	○
171,5	209,6	127,1	12,5	19,05	BI-N B6A151	24215842	○
174,6	206,4	142,4	10	15,9	BI-N B5A151	24316959	○
175	205	100	10	15	BI-N B5B210	24329556	○
175	205	125	10	15	BI-N B5B210	24086139	○
175	210	139,5	12,5	17,5	BI-N B5A151	529575	○
176	216	112	12,5	20	BI-N B6A151	24339738	○
178	210	120,5	10	16	BI-N B5B210	24177370	○
178	210	129,6	10	16	BI-N B5A151	24227002	○
180	210	95	10	15	BI-N B5B210	24073936	○
180	210	95	10	15	BI-N B5B210	24102039	○
180	210	98,5	10	15	BI-N B5B210	24073937	○
180	210	117,4	10	15	BI-N B5B210	24064544	○
180	210	120	10	15	BI-N B5A151	24086603	○
180	210	120	10	15	BI-N B5B210	24079395	○
180	210	120	10	15	BI-N B5B210	24118649	○
180	210	125	10	15	BI-N B5A151	24351234	○
180	210	128	10	15	BI-N B5A151	24095183	○
180	210	143,7	10	15	BI-N B5B210	24067779	○
180	212	120,5	10	16	BI-N B5A151	24258986	○
185	215	120	10	15	BI-N B5B210	24226726	○
185	215	125	10	15	BI-N B5A151	24144468	○
187	227	144	12,5	20	BI-N B6B210	24310517	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
190	220	100	10	15	BI-N B5B210	531927	○
190	220	100	10	15	BI-N B5B210	24086909	○
190	220	117,4	10	15	BI-N B5B210	24064507	○
190	220	120	10	15	BI-N B5A151	24095430	○
190	220	120	10	15	BI-N B5B210	24144248	○
190	230	112	12,5	20	BI-N B6B210	24074444	○
190	230	121	12,5	20	BI-N B6B210	24374261	○
190	230	144	12,5	20	BI-N B6A151	24190666	○
195	225	116	10	15	BI-N B5A151	24234264	○
195	225	125	10	15	BI-N B5A151	24236497	○
195	235	112	12,5	20	BI-N B6B210	24369737	○
196,9	228,6	121	10	15,85	BI-N B5A151	24175026	○
196,9	235	98,5	12,5	19,05	BI-N B6B210	24334696	○
200	230	95	10	15	BI-N B5A151	24117878	○
200	230	95	10	15	BI-N B5B210	24067511	○
200	230	95	10	15	BI-N B5B210	24080361	○
200	230	95	10	15	BI-N B5B210	24102583	○
200	230	100	10	15	BI-N B5B210	24079821	○
200	230	120	10	15	BI-N B5A151	24103378	○
200	230	120	10	15	BI-N B5B210	24077338	○
200	230	120	10	15	BI-N B5B210	24085551	○
200	230	120	10	15	BI-N B5B210	24134983	○
200	230	125	10	15	BI-N B5A151	24187569	○
200	230	145	10	15	BI-N B5A151	24113846	○
200	230	145	10	15	BI-N B5A151	24312077	○
200	240	112	12,5	20	BI-N B6B210	24118009	○
200	240	144	12,5	20	BI-N B6A151	24173300	○
200	240	144	12,5	20	BI-N B6B210	24363113	○
200	240	176	12,5	20	BI-N B6A151	24376548	○
203,2	235	95,1	10	15,9	BI-N B5A151	24314611	○
203,2	241,3	154,9	12,5	19,05	BI-N B6B210	24374142	○
210	240	120	10	15	BI-N B5B210	24295938	○
210	240	125	10	15	BI-N B5B210	24145442	○
210	250	112	12,5	20	BI-N B6B210	24186699	○
210	250	160	12,5	20	BI-N B6A151	24342382	○
215	245	120	10	15	BI-N B5A151	24297755	○
215	245	125	10	15	BI-N B5A151	24373660	○
215,9	265,9	115	15	25	BI-N B4B210	24368392	○
220	250	93	10	15	BI-N B5B210	24079077	○
220	250	95	10	15	BI-N B5B210	24084438	○
220	250	100	10	15	BI-N B5A151	24104945	○
220	250	100	10	15	BI-N B5B210	24101261	○
220	250	120	10	15	BI-N B5B210	24079173	○
220	250	125	10	15	BI-N B5A151	24093699	○
220	250	150	10	15	BI-N B5B210	525566	○
220	260	113	12,5	20	BI-N B6B210	24250470	○
220	260	160	12,5	20	BI-N B6A151	24134773	○
220	260	177	12,5	20	BI-N B6A151	24180571	○
220	265	144	12,5	22,5	BI-N B6A151	24342198	○
220	270	190	15	25	BI-N B6B210	24180261	○

● Available from stock ○ On request: Tool is available, delivery at short notice

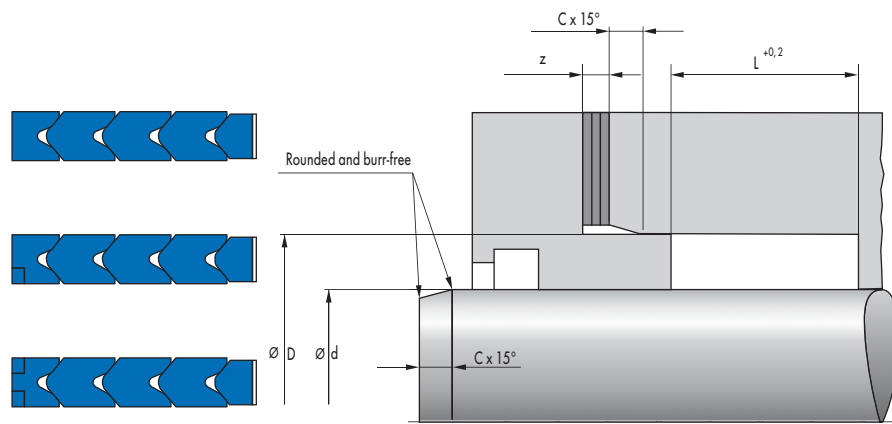


d	D	H	C	Profile	Material	Article No.	
225	255	125	10	15	BI-N B5A151	24260720	○
225	265	128	12,5	20	BI-N B6B210	24080862	○
228,6	260,4	128,3	10	15,9	BI-N B5A151	24084000	○
228,6	260,4	128,3	10	15,9	BI-N B5B210	24087856	○
228,6	266,7	131,7	12,5	19,05	BI-N B6B210	24375502	○
228,6	266,7	155,7	12,5	19,05	BI-N B6A151	24131734	○
230	260	100	10	15	BI-N B5A151	24369140	○
230	270	128	12,5	20	BI-N B6A151	24354079	○
230	270	145	12,5	20	BI-N B6A151	24097102	○
232	276	113	12,5	22	BI-N B6B210	24328804	○
235	265	125	10	15	BI-N B5B210	24087521	○
235	275	145	12,5	20	BI-N B6A151	24101904	○
236,5	280,5	145	12,5	22	BI-N B6A151	24234208	○
240	270	93	10	15	BI-N B5B210	24068389	○
240	270	95	10	15	BI-N B5B210	24083041	○
240	270	125	10	15	BI-N B5A151	24095660	○
240	280	128	12,5	20	BI-N B6A151	24114248	○
240	284	145	12,5	22	BI-N B6A151	24183384	○
241,3	279,4	125,5	12,5	19,05	BI-N B6A151	24363092	○
244,5	284,5	122	12,5	20	BI-N B6B210	24358449	○
245	285	145	12,5	20	BI-N B6B210	24088927	○
247,7	279,4	120,6	10	15,85	BI-N B5B210	24373220	○
247,7	285,8	152,5	12,5	19,05	BI-N B6A151	24250670	○
248	288	144	12,5	20	BI-N B6A151	24366889	○
248	292	113	12,5	22	BI-N B6B210	24328802	○
248,12	279,8	95,4	10	15,85	BI-N B5B210	24355212	○
250	280	93,5	10	15	BI-N B5B210	24067783	○
250	280	95	10	15	BI-N B5B210	24095018	○
250	280	95	10	15	BI-N B5B210	24265123	○
250	280	98	10	15	BI-N B5B210	24064546	○
250	280	100	10	15	BI-N B5A151	24104948	○
250	280	100	10	15	BI-N B5B210	24079929	○
250	280	100	10	15	BI-N B5B210	24178563	○
250	280	120	10	15	BI-N B5A151	24187032	○
250	280	120	10	15	BI-N B5B210	24088939	○
250	280	123,5	10	15	BI-N B5B210	24331791	○
250	280	125	10	15	BI-N B5A151	24259447	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
250	280	125	10	15	BI-N B5B210	24131452	○
250	280	125	10	15	BI-N B5B210	24314411	○
250	290	112	12,5	20	BI-N B6B210	24351541	○
250	290	122	12,5	20	BI-N B6B210	24361128	○
250	290	145	12,5	20	BI-N B6A151	24092915	○
250	290	186	12,5	20	BI-N B6A151	24336364	○
250,8	290,8	145	12,5	20	BI-N B6A151	24308932	○
252	292	128	12,5	20	BI-N B6A151	527305	○
254	285,8	120,7	10	15,9	BI-N B5A151	24308803	○
254	285,8	146	10	15,9	BI-N B5A151	24373996	○
254	292,1	155,6	12,5	19,05	BI-N B6B210	24293343	○
260	290	148,5	10	15	BI-N B5A151	24146185	○
260	300	128	12,5	20	BI-N B6B210	24149020	○
260	300	145	12,5	20	BI-N B6A151	24342650	○
260	300	145	12,5	20	BI-N B6B210	24094118	○
260	300	160	12,5	20	BI-N B6B210	24127684	○
260,4	298,5	168,3	12,5	19,05	BI-N B6A151	24349809	○
265	305	145	12,5	20	BI-N B6A151	24336149	○
265	305	177	12,5	20	BI-N B6B210	24192894	○
266,7	298,5	122,2	10	15,9	BI-N B5A151	24098118	○
266,7	298,5	127	10	15,9	BI-N B5A151	24174946	○
269,9	308	127	12,5	19,05	BI-N B6A151	24094332	○
270	300	98,5	10	15	BI-N B5B210	24313281	○
270	300	123,5	10	15	BI-N B5B210	24335561	○
270	310	160	12,5	20	BI-N B6A151	24120872	○
270	310	177	12,5	20	BI-N B6B210	24069270	○
270	310	186	12,5	20	BI-N B6B210	24372753	○
275	315	128	12,5	20	BI-N B6A151	530313	○
275	315	160	12,5	20	BI-N B6A151	24112170	○
277	321	145	12,5	22	BI-N B6A151	24339730	○
279,4	311,2	114,2	10	15,9	BI-N B5B210	24174288	○
279,4	317,5	146,2	12,5	19,05	BI-N B6A151	24083634	○
280	320	122	12,5	20	BI-N B6A151	24335571	○
280	320	126	12,5	20	BI-N B6B210	24128210	○
280	320	128	12,5	20	BI-N B6B210	24069570	○
280	320	128	12,5	20	BI-N B6B210	24088941	○
280	320	142,2	12,5	20	BI-N B6B210	24073728	○
280	320	145	12,5	20	BI-N B6A151	24082121	○
280	320	145	12,5	20	BI-N B6B210	24147219	○
280	320	160	12,5	20	BI-N B6A151	24076833	○
280	320	160	12,5	20	BI-N B6B210	24100005	○
280	320	160	12,5	20	BI-N B6B210	24232263	○
280	320	175	12,5	20	BI-N B6B210	24377255	○
280	320	177	12,5	20	BI-N B6B210	24373451	○
280	320	186	12,5	20	BI-N B6B210	24105201	○
280	320	192	12,5	20	BI-N B6B210	24312668	○
280	324	177	12,5	22	BI-N B5B210	24361148	○
285	325	128,1	12,5	20	BI-N B6B210	24296272	○
285	325	145	12,5	20	BI-N B6B210	24069878	○
285	325	177	12,5	20	BI-N B6B210	24173263	○

● Available from stock ○ On request: Tool is available, delivery at short notice

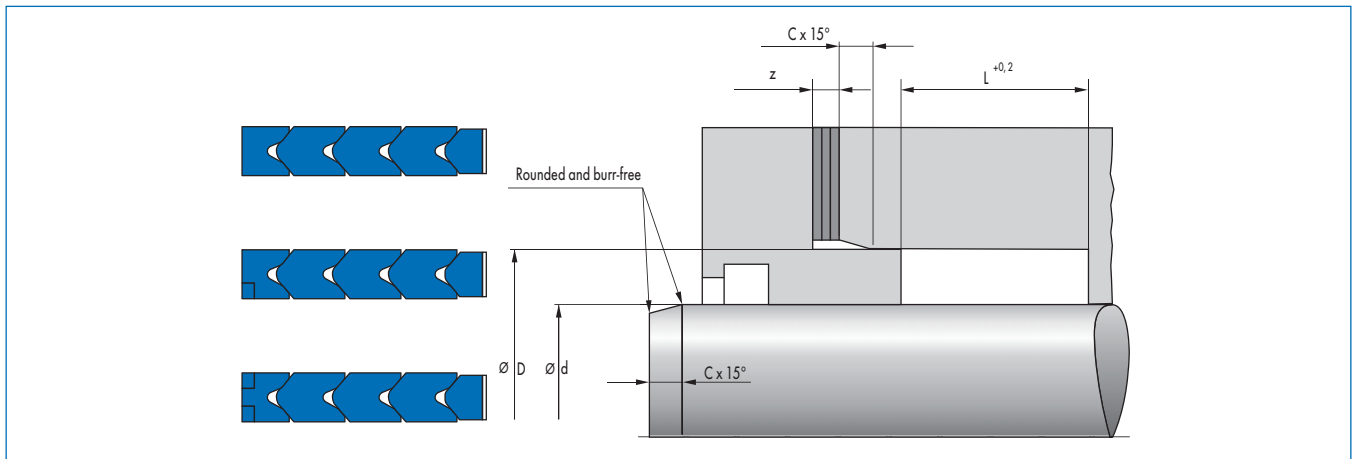


d	D	H	C	Profile	Material	Article No.	
285,75	317,5	88,9	10	15,9	BI-N B5B210	24377750	○
290	330	145	12,5	20	BI-N B6B210	24100201	○
290	330	155	12,5	20	BI-N B6B210	527358	○
290	340	190	15	25	BI-N B6A151	24336162	○
290	342,4	152	15	26,2	BI-N B6A151	24110184	○
292,1	323,9	122,5	10	15,9	BI-N B5A151	24313946	○
292,1	330,2	127	12,5	19,05	BI-N B6A151	24334915	○
295	335	131	12,5	20	BI-N B6B210	527357	○
296	340	145	12,5	22	BI-N B6A151	24263506	○
296	340	145	12,5	22	BI-N B6B210	24338573	○
296	340	177	12,5	22	BI-N B5B210	24357849	○
296	340	177	12,5	22	BI-N B6A151	24265097	○
300	330	83	10	15	BI-N B5B210	24258695	○
300	330	123,5	10	15	BI-N B5A151	24076507	○
300	340	110,9	12,5	20	BI-N B6B210	24069269	○
300	340	111	12,5	20	BI-N B6A151	24356483	○
300	340	113	12,5	20	BI-N B6B210	24074692	○
300	340	113	12,5	20	BI-N B6B210	24091937	○
300	340	126	12,5	20	BI-N B6B210	24332577	○
300	340	131	12,5	20	BI-N B6A151	24105199	○
300	340	131	12,5	20	BI-N B6B210	24341825	○
300	340	145	12,5	20	BI-N B6A151	24114005	○
300	340	145	12,5	20	BI-N B6B210	24073932	○
300	340	158	12,5	20	BI-N B6B210	24073420	○
300	340	176	12,5	20	BI-N B6A151	24193710	○
300	340	177	12,5	20	BI-N B6A151	24137476	○
300	340	177	12,5	20	BI-N B6A151	24288296	○
300	340	177	12,5	20	BI-N B6B210	24129980	○
304,8	342,9	114,3	12,5	19,05	BI-N B6B210	24182228	○
304,8	342,9	127,1	12,5	19,05	BI-N B6A151	24339833	○
304,8	342,9	133,4	12,5	19,05	BI-N B6B210	24377840	○
304,8	342,9	146,2	12,5	19,05	BI-N B6A151	24081729	○
304,8	342,9	155,7	12,5	19,05	BI-N B6A151	24103677	○
305	336,8	76	10	15,9	BI-N B5B210	24145000	○
305	345	145	12,5	20	BI-N B6B210	24223611	○
308	340	114,6	10	16	BI-N B5A151	24360349	○
310	350	113	12,5	20	BI-N B6B210	24251438	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
310	350	145	12,5	20	BI-N B6A151	24191553	○
310	350	145	12,5	20	BI-N B6B210	24096028	○
310	350	177	12,5	20	BI-N B6A151	24108181	○
310	350	195	12,5	20	BI-N B6B210	24292048	○
310	354	145	12,5	22	BI-N B6A151	24234212	○
311,2	342,9	114	10	15,85	BI-N B5B210	24136894	○
311,2	349,3	137,2	12,5	19,05	BI-N B6A151	24374521	○
311,2	349,3	145,9	12,5	19,05	BI-N B6A151	24230186	○
312	356	145	12,5	22	BI-N B6A151	24339726	○
315	355	128	12,5	20	BI-N B6B210	24347013	○
315	355	145	12,5	20	BI-N B6B210	24072391	○
315	355	177	12,5	20	BI-N B6B210	24119151	○
316	360	145	12,5	22	BI-N B6A151	24259155	○
316	360	145	12,5	22	BI-N B6B210	24259335	○
317,5	349,3	76	10	15,9	BI-N B5B210	24172096	○
317,5	355,6	137,2	12,5	19,05	BI-N B6A151	24082101	○
318	362	145	12,5	22	BI-N B6B210	24355004	○
318,7	362,7	177	12,5	22	BI-N B6B210	24223370	○
320	276	145	12,5	22	BI-N B6A151	24380435	○
320	350	148,5	10	15	BI-N B5A151	527010	○
320	360	113	12,5	20	BI-N B6B210	24081756	○
320	360	113	12,5	20	BI-N B6B210	24198245	○
320	360	128	12,5	20	BI-N B6A151	24340781	○
320	360	128	12,5	20	BI-N B6B210	24329555	○
320	360	131	12,5	20	BI-N B6A151	24258138	○
320	360	131	12,5	20	BI-N B6A151	24269680	○
320	360	145	12,5	20	BI-N B6A151	24220676	○
320	360	145	12,5	20	BI-N B6B210	24083098	○
320	360	145	12,5	20	BI-N B6B210	24090386	○
320	360	145	12,5	20	BI-N B6B210	24134796	○
320	360	145	12,5	20	BI-N B6B210	24308161	○
320	360	160	12,5	20	BI-N B6B210	24349309	○
320	360	163	12,5	20	BI-N B6A151	24233272	○
320	360	163	12,5	20	BI-N B6B210	24377739	○
320	364	145	12,5	22	BI-N B6A151	24337559	○
320	364	145	12,5	22	BI-N B6B210	24353311	○
320	370	150	15	25	BI-N B6A151	24377421	○
320	370	150	15	25	BI-N B6B210	24068349	○
320	370	190	15	25	BI-N B6A151	24140308	○
325	365	145	12,5	20	BI-N B6A151	24141199	○
325	365	190	12,5	20	BI-N B6A151	24293014	○
327	380	150	15	26,5	BI-N B6B210	24112192	○
330	370	113	12,5	20	BI-N B6B210	24376045	○
330	370	145	12,5	20	BI-N B6A151	24068708	○
330	370	145	12,5	20	BI-N B6B210	24352154	○
330	370	177	12,5	20	BI-N B6B210	24181589	○
330,2	368,3	145	12,5	19,05	BI-N B6B210	24263431	○
335	375	145	12,5	20	BI-N B6A151	24227944	○
335	375	145	12,5	20	BI-N B6B210	24292075	○
335	375	160	12,5	20	BI-N B6A151	24235542	○

● Available from stock ○ On request: Tool is available, delivery at short notice

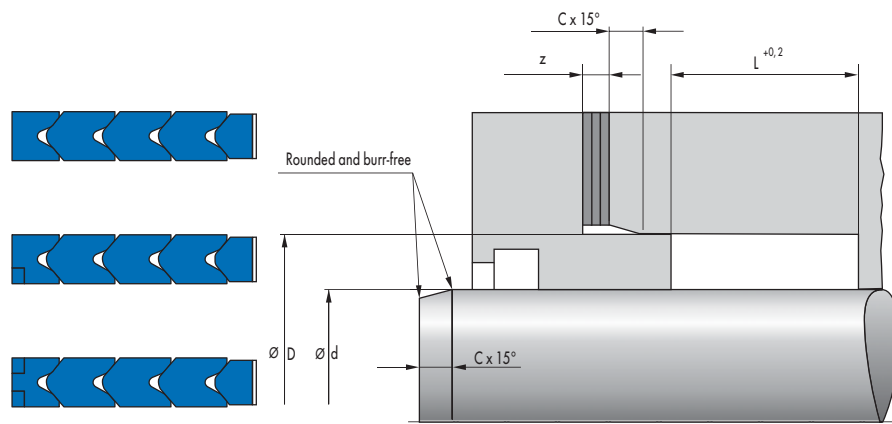


d	D	H	C	Profile	Material	Article No.	
335,7	375,7	145	12,5	20	BI-N B6B210	24338136	○
340	380	126	12,5	20	BI-N B6B210	24092861	○
340	380	128	12,5	20	BI-N B6A151	24111899	○
340	380	128	12,5	20	BI-N B6B210	24341062	○
340	380	145	12,5	20	BI-N B6A151	24123530	○
340	380	145	12,5	20	BI-N B6B210	24104204	○
340	380	177	12,5	20	BI-N B6B210	528836	○
341	381	177	12,5	20	BI-N B6A151	24337641	○
342	382	128	12,5	20	BI-N B6A151	24354084	○
343	381,1	145	12,5	19,05	BI-N B6B210	24264137	○
345	385	145	12,5	20	BI-N B6B210	24330507	○
347	387	128	12,5	20	BI-N B6B210	24372638	○
350	390	128	12,5	20	BI-N B6A151	49002536	○
350	390	145	12,5	20	BI-N B6A151	24080224	○
350	390	145	12,5	20	BI-N B6B210	24352156	○
350	410	150	15	30	BI-N B6B210	24087674	○
352	402	150	15	25	BI-N B6A151	24339753	○
354	394	145	12,5	20	BI-N B6A151	24170918	○
360	400	128	12,5	20	BI-N B6A151	24216860	○
360	400	128	12,5	20	BI-N B6B210	24086871	○
360	400	145	12,5	20	BI-N B6A151	24313949	○
360	400	145	12,5	20	BI-N B6B210	24078133	○
360	400	145	12,5	20	BI-N B6B210	24094504	○
360	400	160	12,5	20	BI-N B6A151	24124593	○
360	410	150	15	25	BI-N B6B210	24129904	○
360	410	190	15	25	BI-N B6B210	24360329	○
368,03	413,03	153,4	12,5	22,5	BI-N B6B210	24378127	○
368,3	406,4	145	12,5	19,05	BI-N B6B210	24332353	○
368,7	418,7	190	15	25	BI-N B6B210	24208146	○
370	410	145	12,5	20	BI-N B6A151	24108185	○
370	410	145	12,5	20	BI-N B6B210	24094958	○
370	420	190	15	25	BI-N B6B210	24374154	○
376	420	145	12,5	22	BI-N B6B210	24107256	○
376	420	177	12,5	22	BI-N B6B210	24351540	○
378	422,5	152,5	12,5	22,25	BI-N B6B210	24353298	○
380	420	110,9	12,5	20	BI-N B6B210	24065475	○
380	420	113	12,5	20	BI-N B6A151	24208753	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
380	420	113	12,5	20	BI-N B6B210	24079891	○
380	420	115	12,5	20	BI-N B6B210	24100147	○
380	420	145	12,5	20	BI-N B6B210	24079873	○
380	420	158	12,5	20	BI-N B6B210	24073422	○
380	420	160	12,5	20	BI-N B6A151	24334129	○
380	420	177	12,5	20	BI-N B6B210	24127561	○
380	420	190	12,5	20	BI-N B6B210	24338918	○
381	419,1	127	12,5	19,05	BI-N B6A151	24292076	○
385	425	160	12,5	20	BI-N B6B210	24312117	○
385	430	144	12,5	22,5	BI-N B6A151	24342155	○
390	420	123,5	10	15	BI-N B5A151	24291700	○
390	420	123,5	10	15	BI-N B5B210	24373364	○
390	430	126	12,5	20	BI-N B6A151	24108188	○
393,7	431,8	127	12,5	19,05	BI-N B6B210	24371782	○
395	435	160	12,5	20	BI-N B6B210	24137853	○
395	435	190	12,5	20	BI-N B6B210	24244761	○
395	435	192	12,5	20	BI-N B6B210	24250377	○
397	432	95,9	12,5	17,5	BI-N B5B210	24241239	○
397	432	123,8	12,5	17,5	BI-N B5B210	24250522	○
400	430	123,5	10	15	BI-N B5A151	24295019	○
400	440	110,9	12,5	20	BI-N B6B210	24068227	○
400	440	113	12,5	20	BI-N B6B210	24100722	○
400	440	140,5	12,5	20	BI-N B6A151	24260689	○
400	440	142,2	12,5	20	BI-N B6B210	24069173	○
400	440	143	12,5	20	BI-N B6A151	24120783	○
400	440	143	12,5	20	BI-N B6A151	24186985	○
400	440	145	12,5	20	BI-N B6B210	24074763	○
400	440	158	12,5	20	BI-N B6B210	24084987	○
400	440	160	12,5	20	BI-N B6B210	24113693	○
400	440	177	12,5	20	BI-N B6B210	24182287	○
400	460	150	15	30	BI-N B6B210	24067618	○
405	440	95,9	12,5	17,5	BI-N B5B210	24358976	○
405	445	145	12,5	20	BI-N B6B210	527314	○
406,4	444,5	127	12,5	19,05	BI-N B6B210	24179577	○
406,4	444,5	138	12,5	19,05	BI-N B6B210	24340035	○
406,4	445	141,6	12,5	19,3	BI-N B6B210	24237308	○
406,4	450,9	152,5	12,5	22,25	BI-N B6A151	24353811	○
410	450	129	12,5	20	BI-N B6B210	24349979	○
410	450	145	12,5	20	BI-N B6A151	24196194	○
410	450	158	12,5	20	BI-N B6A151	24234365	○
410	454,5	152,5	12,5	22,25	BI-N B6B210	24251682	○
410	460	105	15	25	BI-N B6A151	24341363	○
410	460	150	15	25	BI-N B6B210	526286	○
415	465	190	15	25	BI-N B6A151	24360861	○
416	456	129	12,5	20	BI-N B6A151	24375513	○
417	455,1	127	12,5	19,05	BI-N B6A151	24259790	○
417	455,1	127	12,5	19,05	BI-N B6A151	24306612	○
418	456,1	128,1	12,5	19,05	BI-N B6A151	24296249	○
419,1	457,2	138	12,5	19,05	BI-N B6A151	24080461	○
419,1	457,2	155	12,5	19,05	BI-N B6B210	24345632	○

● Available from stock ○ On request: Tool is available, delivery at short notice

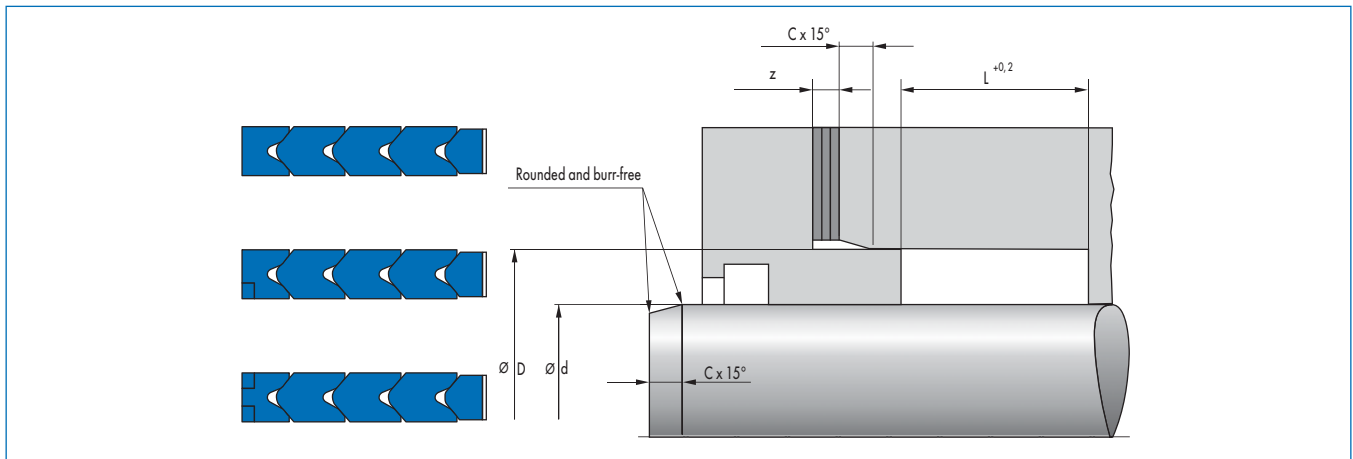


d	D	H	C	Profile	Material	Article No.	
420	460	113	12,5	20	BI-N B6B210	24380434	○
420	460	115	12,5	20	BI-N B6B210	24356723	○
420	460	126	12,5	20	BI-N B6B210	24081749	○
420	460	128	12,5	20	BI-N B6B210	24132945	○
420	460	145	12,5	20	BI-N B6B210	24094357	○
420	460	145	12,5	20	BI-N B6B210	24102036	○
420	460	145	12,5	20	BI-N B6B210	24141625	○
420	460	158	12,5	20	BI-N B6A151	24187012	○
420	460	158	12,5	20	BI-N B6B210	24362279	○
420	460	160	12,5	20	BI-N B6B210	24145021	○
425	465	128	12,5	20	BI-N B6B210	24089066	○
425	465	129	12,5	20	BI-N B6B210	24265089	○
425	475	170	15	25	BI-N B6B210	24328801	○
425,5	469,9	152,4	12,5	22,2	BI-N B6A151	24334886	○
430	462	80	10	16	BI-N B5B210	24290411	○
430	468,1	137	12,5	19,05	BI-N B6B210	24315093	○
430	470	128	12,5	20	BI-N B6B210	24239323	○
430	470	147	12,5	20	BI-N B6A151	24290873	○
430	470	160	12,5	20	BI-N B6B210	24241829	○
430	480	190	15	25	BI-N B6A151	24174786	○
431,8	469,9	117	12,5	19,05	BI-N B6B210	24144244	○
431,8	469,9	127	12,5	19,05	BI-N B6A151	24195079	○
431,8	469,9	127	12,5	19,05	BI-N B6B210	24112072	○
431,8	469,9	132,1	12,5	19,05	BI-N B6B210	24250380	○
431,8	469,9	137	12,5	19,05	BI-N B6A151	24193039	○
431,8	481,8	205	15	25	BI-N B6A151	24260968	○
440	480	113	12,5	20	BI-N B6B210	24296483	○
440	480	145	12,5	20	BI-N B6B210	24105472	○
444,5	482,6	137,8	12,5	19,05	BI-N B6A151	24080635	○
444,5	482,6	144,8	12,5	19,05	BI-N B6A151	24088689	○
445,5	490	152,5	12,5	22,25	BI-N B6B210	24088203	○
449	489	113	12,5	20	BI-N B6B210	24311197	○
450	490	113	12,5	20	BI-N B6B210	24140481	○
450	490	115	12,5	20	BI-N B6B210	24100244	○
450	490	128	12,5	20	BI-N B6A151	24193395	○
450	490	142,2	12,5	20	BI-N B6B210	24065889	○
450	490	145	12,5	20	BI-N B6A151	24082818	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
450	490	145	12,5	20	BI-N B6B210	24183919	○
450	490	145	12,5	20	BI-N B6B210	49002882	○
450	490	160	12,5	20	BI-N B6A151	24148090	○
450	490	160	12,5	20	BI-N B6A151	24187011	○
450	490	177	12,5	20	BI-N B6B210	24188288	○
450	490	192	12,5	20	BI-N B6A151	24103375	○
450	494,5	152	12,5	22,25	BI-N B6B210	24354730	○
450	510	150	15	30	BI-N B6A151	24123582	○
450	510	150	15	30	BI-N B6B210	24103806	○
454	494	113	12,5	20	BI-N B6B210	24336604	○
455	495	145	12,5	20	BI-N B6A151	24377415	○
455	495	177	12,5	20	BI-N B6B210	528832	○
457	489	96	10	16	BI-N B5B210	24308359	○
457	489	96	10	16	BI-N B6A151	24257360	○
457,2	495,3	115,5	12,5	19,05	BI-N B6B210	24181195	○
457,2	495,3	141,6	12,5	19,05	BI-N B6A151	24105140	○
458	508	105	15	25	BI-N B6B210	24257100	○
460	500	113	12,5	20	BI-N B6B210	24140807	○
460	500	145	12,5	20	BI-N B6B210	24174102	○
460	504,5	152,5	12,5	22,25	BI-N B6A151	24231979	○
460	510	150	15	25	BI-N B6B210	24073241	○
460	510	190	15	25	BI-N B6B210	24358389	○
460	510	230	15	25	BI-N B6B210	24172974	○
460	520	150	15	30	BI-N B6B210	24339577	○
460	520	230	15	30	BI-N B6A151	529949	○
460,8	510,8	190	15	25	BI-N B6A151	24108621	○
462	512	130	15	25	BI-N B6B210	24356491	○
469,9	501,9	96	10	16	BI-N B5B210	24172588	○
469,9	514,4	139,8	12,5	22,25	BI-N B6A151	24296719	○
469,9	514,4	168,4	12,5	22,25	BI-N B6A151	24375626	○
470	520	205	15	25	BI-N B6B210	24087106	○
474	530	215	15	28	BI-N B6B210	24235858	○
475	515	143	12,5	20	BI-N B6A151	24343744	○
475	525	190	15	25	BI-N B6B210	24341837	○
476	526	165	15	25	BI-N B6B210	24268974	○
480	520	145	12,5	20	BI-N B6B210	24181798	○
480	520	171	12,5	20	BI-N B6B210	24135776	○
480	520	177	12,5	20	BI-N B6B210	24297826	○
480	530	180	15	25	BI-N B6B210	24358270	○
480	530	185	15	25	BI-N B6B210	24343108	○
480	530	190	15	25	BI-N B6B210	24346601	○
482,6	520,7	134	12,5	19,05	BI-N B6A151	24188335	○
482,6	527,1	181,1	12,5	22,25	BI-N B6A151	24104762	○
485	535	150	15	25	BI-N B6B210	24316199	○
490	530	145	12,5	20	BI-N B6B210	24335914	○
490	530	179	12,5	20	BI-N B6A151	24370249	○
495	555	190	15	30	BI-N B6B210	24352210	○
495,3	533,4	121,3	12,5	19,05	BI-N B6B210	24172098	○
495,3	533,4	152,4	12,5	19,05	BI-N B6B210	24232303	○
497	547	190	15	25	BI-N B6A151	24339742	○

● Available from stock ○ On request: Tool is available, delivery at short notice

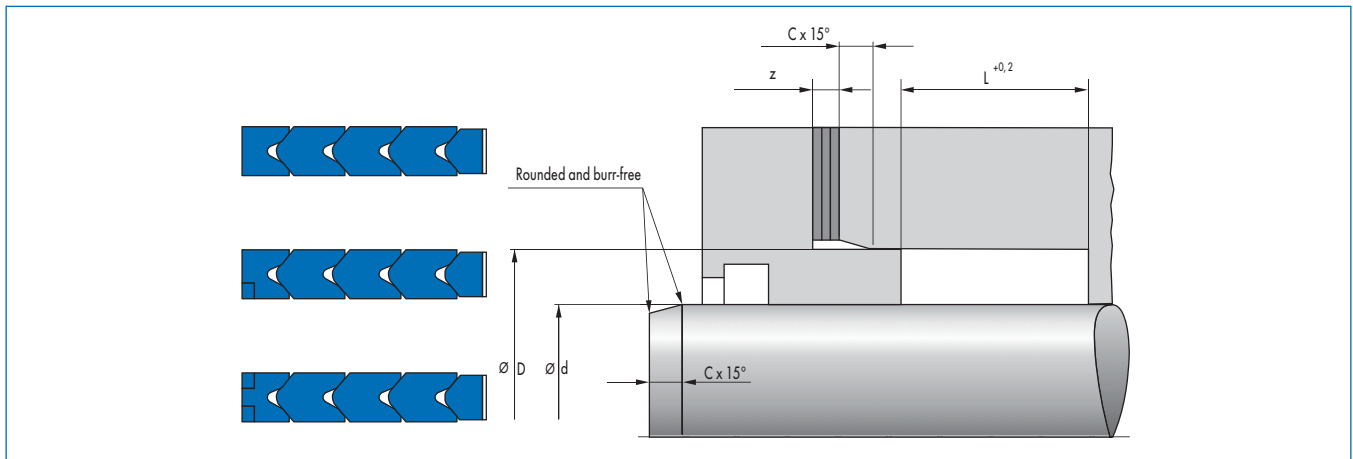


d	D	H	C	Profile	Material	Article No.	
497	550	198	15	26,5	BI-N B6A151	24227897	○
500	540	143	12,5	20	BI-N B6B210	24235063	○
500	540	145	12,5	20	BI-N B6B210	24131965	○
500	540	179	12,5	20	BI-N B6B210	24173186	○
500	544,4	152,5	12,5	22,2	BI-N B6A151	24302825	○
500	550	150	15	25	BI-N B6B210	24263560	○
500	550	200	15	25	BI-N B6B210	24259600	○
500	560	150	15	30	BI-N B6B210	24096077	○
501,7	539,8	106,4	12,5	19,05	BI-N B6B210	24353558	○
501,7	546,2	181,1	12,5	22,25	BI-N B6A151	24149032	○
501,7	551,7	190	15	25	BI-N B6B210	24218196	○
502,1	552,1	190	15	25	BI-N B6A151	24108617	○
505	545	112	12,5	20	BI-N B6B210	24344885	○
505	545	126	12,5	20	BI-N B6B210	24077031	○
508	560	238	15	26	BI-N B6A151	24228479	○
510	560	125	15	25	BI-N B6B210	24236423	○
510	560	225	15	25	BI-N B6A151	24180567	○
510	570	150	15	30	BI-N B6B210	24069252	○
510	570	190	15	30	BI-N B6B210	24234349	○
515	555	147	12,5	20	BI-N B6B210	24131507	○
515	555	179	12,5	20	BI-N B6B210	24296250	○
515	565	85	15	25	BI-N B6B210	24302535	○
515	565	200	15	25	BI-N B6B210	24180280	○
517,5	555,6	101,6	12,5	19,05	BI-N B6A151	24242138	○
517,5	555,6	101,6	12,5	19,05	BI-N B6B210	24371136	○
520	560	179	12,5	20	BI-N B6B210	24300451	○
520	570	145	15	25	BI-N B6B210	24346052	○
520	570	160	15	25	BI-N B6A151	24121575	○
520	570	160	15	25	BI-N B6B210	24339685	○
520	570	190	15	25	BI-N B6B210	24179325	○
520	580	150	15	30	BI-N B6B210	24228623	○
527,8	585	195,4	15	28,6	BI-N B6B210	24372363	○
530	580	90	15	25	BI-N B6B210	24353438	○
530	580	187,6	15	25	BI-N B6B210	24074326	○
530	580	190	15	25	BI-N B6B210	24290849	○
530	585	155	15	27,5	BI-N B6A151	24300918	○
531	585	190	15	27	BI-N B6B210	24372362	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
531	591	190	15	30	BI-N B6B210	24353306	○
533	585	158	15	26	BI-N B6A151	24311354	○
533,4	577,9	184,3	12,5	22,25	BI-N B6B210	24259420	○
534	590	215	15	28	BI-N B6B210	24294159	○
540	590	166	15	25	BI-N B6B210	24314230	○
540	590	190	15	25	BI-N B6B210	24240751	○
546,1	584,2	101,6	12,5	19,05	BI-N B6B210	24332354	○
546,1	584,2	104	12,5	19,05	BI-N B6B210	24299390	○
550	590	147	12,5	20	BI-N B6B210	24232031	○
550	600	190	15	25	BI-N B6B210	24378227	○
550	610	150	15	30	BI-N B6A151	24243658	○
550	610	190	15	30	BI-N B6A151	24198923	○
550	612	193	15	31	BI-N B6A151	24217533	○
553	603	190	15	25	BI-N B6A151	527836	○
555	610	163	15	27,5	BI-N B6A151	24178288	○
555	610	200	15	27,5	BI-N B6B210	532613	○
558	610	198	15	26	BI-N B6B210	24377386	○
558	610	238	15	26	BI-N B6A151	24331947	○
558	610	238	15	26	BI-N B6B210	24369178	○
558	612	190	15	27	BI-N B6B210	49004105	○
558,8	590,6	119,6	10	15,9	BI-N B5A151	24344275	○
558,8	602,8	212,7	12,5	22	BI-N B6A151	24231472	○
560	604	165	12,5	22	BI-N B6B210	24330867	○
560	610	150	15	25	BI-N B6B210	24099753	○
560	610	160	15	25	BI-N B6A151	24339092	○
560	610	190	15	25	BI-N B6A151	24086022	○
560	610	190	15	25	BI-N B6B210	24066993	○
560	610	195	15	25	BI-N B6B210	24069335	○
560,5	612,5	198	15	26	BI-N B6A151	24120108	○
565	605	115	12,5	20	BI-N B6B210	24292917	○
565	605	147	12,5	20	BI-N B6A151	24246913	○
565	605	147	12,5	20	BI-N B6B210	24227111	○
568	608	190	12,5	20	BI-N B6A151	24079970	○
568	612	199,9	12,5	22	BI-N B6B210	24264683	○
570	614,5	165,2	12,5	22,25	BI-N B6A151	24340589	○
570	620	180	15	25	BI-N B6A151	24295267	○
570	620	190	15	25	BI-N B6B210	24097638	○
570	620	199,5	15	25	BI-N B6A151	24217660	○
570	620	230	15	25	BI-N B6B210	24102920	○
571,5	609,6	127	12,5	19,05	BI-N B6B210	24104839	○
571,5	609,6	152,4	12,5	19,05	BI-N B6B210	24144714	○
571,5	621,5	215	15	25	BI-N B6B210	24369679	○
580	620	143	12,5	20	BI-N B6A151	24099077	○
580	630	150	15	25	BI-N B6B210	24078789	○
580	630	150	15	25	BI-N B6B210	24214757	○
580	630	195	15	25	BI-N B6B210	24232077	○
580	630	200	15	25	BI-N B6B210	24300598	○
580	630	227	15	25	BI-N B6B210	24263450	○
580	640	150	15	30	BI-N B6A151	24372404	○
584,2	622,3	152,4	12,5	19,05	BI-N B6B210	24146305	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	C	Profile	Material	Article No.	
584,2	622,3	160	12,5	19,05	BI-N B6B210	24352074	○
585	635	145,4	15	25	BI-N B6B210	24191761	○
590	630	158	12,5	20	BI-N B6B210	24301049	○
590	640	200	15	25	BI-N B6B210	24331159	○
596,9	635	110,5	12,5	19,05	BI-N B6B210	24346129	○
598	654	179	15	28	BI-N B6B210	24353317	○
600	650	135	15	25	BI-N B6B210	24352264	○
600	650	160	15	25	BI-N B6B210	525604	○
600	650	166	15	25	BI-N B6B210	24336682	○
600	650	175	15	25	BI-N B6B210	526998	○
600	650	190	15	25	BI-N B6A151	24199286	○
600	650	190	15	25	BI-N B6B210	24367556	○
600	650	200	15	25	BI-N B6B210	24346636	○
600	650	230	15	25	BI-N B6B210	24128599	○
600	660	190	15	30	BI-N B6B210	24369723	○
605	655	190	15	25	BI-N B6B210	24187840	○
605	655	195	15	25	BI-N B6B210	24297813	○
607	660	190	15	26,5	BI-N B6B210	24116299	○
608,5	660,5	158	15	26	BI-N B6B210	528699	○
608,5	660,5	198	15	26	BI-N B6B210	24310618	○
609,6	654,1	140,7	12,5	22,25	BI-N B6B210	24128385	○
610	648,1	152,4	12,5	19,05	BI-N B6B210	24333279	○
610	660	170	15	25	BI-N B6B210	24378950	○
610	660	200	15	25	BI-N B6B210	24135211	○
610	660	205	15	25	BI-N B6B210	24378884	○
610	660,8	176	15	25,4	BI-N B6B210	24264165	○
610	662	198	15	26	BI-N B6B210	24294757	○
620	670	200	15	25	BI-N B6A151	24142736	○
620	670	200	15	25	BI-N B6B210	24084988	○
625	680	200	15	27,5	BI-N B6B210	24287038	○
626	670	130,1	12,5	22	BI-N B6B210	24305989	○
628,7	666,8	119,9	12,5	19,05	BI-N B6B210	24375498	○
630	670	158	12,5	20	BI-N B6B210	24302539	○
630	680	129	15	25	BI-N B6B210	24357999	○
630	680	150	15	25	BI-N B6B210	24230115	○
630	680	160	15	25	BI-N B6B210	24251922	○
630	680	187,6	15	25	BI-N B6B210	24069554	○

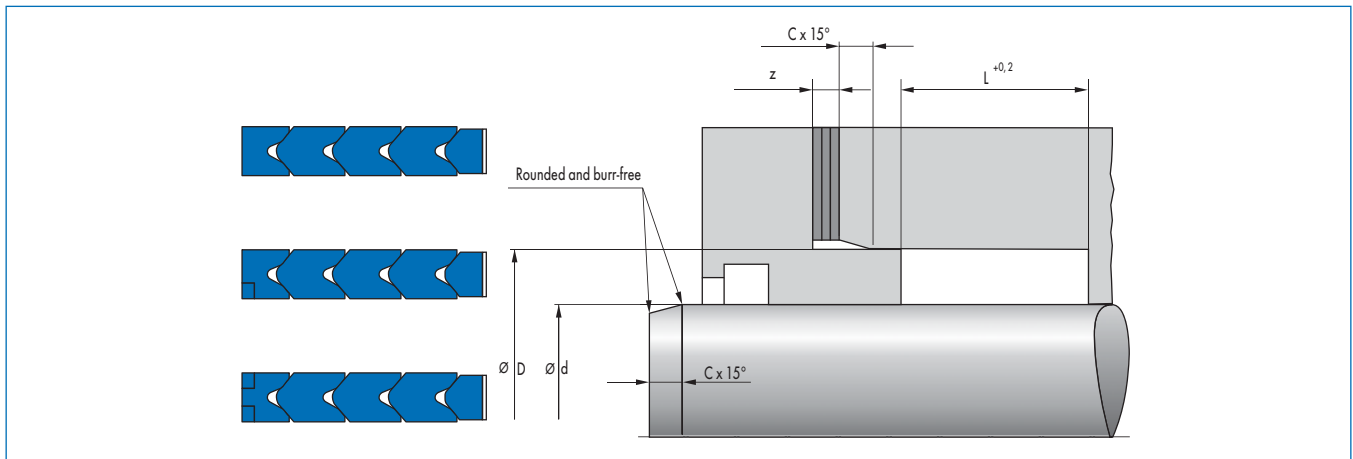
● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
630	680	200	15	25	BI-N B6B210	24099618	○
630	680	200	15	25	BI-N B6B210	24220925	○
630	680	200	15	25	BI-N B6B210	24328608	○
630	680	230	15	25	BI-N B6B210	24082945	○
630	682	198	15	26	BI-N B6B210	49002502	○
635	673,1	127	12,5	19,05	BI-N B6A151	24111999	○
635	673,1	127	12,5	19,05	BI-N B6B210	24112060	○
640	690	160	15	25	BI-N B6B210	24339573	○
640	690	195	15	25	BI-N B6B210	24240577	○
640	690	200	15	25	BI-N B6B210	24112670	○
640	690	200	15	25	BI-N B6B210	24126349	○
640	690	230	15	25	BI-N B6A151	24238843	○
640	690	230	15	25	BI-N B6B210	24077702	○
640	694	190	15	27	BI-N B6B210	24294753	○
646	701	192	15	27,5	BI-N B6B210	24264281	○
647,7	697,7	210	15	25	BI-N B6B210	24274178	○
650	690	126	12,5	20	BI-N B6B210	24293784	○
650	690	158	12,5	20	BI-N B6A151	24127989	○
650	690	190	12,5	20	BI-N B6B210	24341706	○
650	700	150	15	25	BI-N B6B210	24349319	○
650	700	200	15	25	BI-N B6A151	24328457	○
650	700,8	230	15	25,4	BI-N B6A151	24258953	○
653	703	160	15	25	BI-N B6B210	24256681	○
654,1	704,9	203	15	25,4	BI-N B6B210	24145955	○
660	700	175,1	12,5	20	BI-N B6B210	24312114	○
660	710	230	15	25	BI-N B6A151	24103429	○
660	712	198	15	26	BI-N B6B210	24073266	○
666,8	717,6	176	15	25,4	BI-N B6B210	24267914	○
670	714	199,9	12,5	22	BI-N B6B210	24175477	○
670	720	142	15	25	BI-N B6B210	24346269	○
670	720	200	15	25	BI-N B6B210	24081923	○
675	725	230	15	25	BI-N B6B210	24295867	○
678	730	198	15	26	BI-N B6B210	24094153	○
680	720	143	12,5	20	BI-N B6B210	24130360	○
680	730	195	15	25	BI-N B6B210	24079296	○
680	730	195	15	25	BI-N B6B210	24233952	○
685	735	166	15	25	BI-N B6B210	24236880	○
685,8	723,9	127,1	12,5	19,05	BI-N B6B210	24369184	○
685,8	725,8	175,1	12,5	20	BI-N B6B210	24244967	○
689,5	749,5	195	15	30	BI-N B6A151	24302205	○
690	740	166	15	25	BI-N B6B210	24237305	○
690	740	176	15	25	BI-N B6B210	24363225	○
690,3	730,3	155,1	12,5	20	BI-N B6B210	24299743	○
692,2	730,3	154,9	12,5	19,05	BI-N B6B210	24095826	○
693	753	190	15	30	BI-N B6B210	24263461	○
695	745	230	15	25	BI-N B6B210	24132941	○
700	740	126	12,5	20	BI-N B6B210	24192973	○
700	750	195	15	25	BI-N B6A151	24344128	○
700	754	160	15	27	BI-N B6B210	24354734	○
700	760	190	15	30	BI-N B6B210	528695	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
730	780	200	15	25	BI-N B6A151	24311388	○
730	780	230	15	25	BI-N B6A151	24258590	○
730,5	794	190,5	15	31,75	BI-N B6A151	524598	○
736,6	787,4	200	15	25,4	BI-N B6B210	533195	○
736,6	787,4	230	15	25,4	BI-N B6A151	24109290	○
738,1	792,1	153,1	15	27	BI-N B6B210	24178499	○
740	780	143	12,5	20	BI-N B6B210	24290757	○
740	790	190	15	25	BI-N B6B210	24190601	○
740	790	230	15	25	BI-N B6B210	24145292	○
742	787	164	12,5	22,5	BI-N B6B210	24341319	○
747,7	793,7	115,5	15	23	BI-N B6A151	24238851	○
749,5	794,5	164	12,5	22,5	BI-N B6B210	24341323	○
750	790	143	12,5	20	BI-N B6A151	24138734	○
750	790	143	12,5	20	BI-N B6B210	24351539	○
750	790	190	12,5	20	BI-N B6B210	24332683	○
750	800	200	15	25	BI-N B6B210	24075462	○
753	803	200	15	25	BI-N B6B210	24342450	○
756	810	190	15	27	BI-N B6A151	24343732	○
756	810	198	15	27	BI-N B6B210	24357941	○
757	807,8	166	15	25,4	BI-N B6B210	24376197	○
760	810	190	15	25	BI-N B6A151	49004692	○
760	810	190	15	25	BI-N B6B210	24377920	○
760	810	230	15	25	BI-N B6A151	49005116	○
760	810	230	15	25	BI-N B6B210	529609	○
760,4	817,6	209,5	15	28,6	BI-N B6A151	24293109	○
768	822	212,7	15	27	BI-N B6B210	24355003	○
770	820	166	15	25	BI-N B6B210	24362209	○
770	820	166	15	25	BI-N B6B210	24362210	○
770	820	185	15	25	BI-N B6B210	24375371	○
770	820	200	15	25	BI-N B6A151	24256829	○
770	830	230	15	30	BI-N B6B210	24353514	○
772	822	230	15	25	BI-N B6A151	24146266	○
779,2	830	190	15	25,4	BI-N B6B210	24145736	○
780	830	166	15	25	BI-N B6A151	24369144	○
780	830	190	15	25	BI-N B6B210	24226117	○
780	830	200	15	25	BI-N B6B210	24148684	○
780	830	230	15	25	BI-N B6B210	24342184	○
782,8	840	254	15	28,6	BI-N B6A151	24220320	○
785	835	230	15	25	BI-N B6A151	24378155	○
787,4	838,2	190	15	25,4	BI-N B6A151	24296452	○
787,4	838,2	227	15	25,4	BI-N B6A151	24181133	○
787,4	841,4	180	15	27	BI-N B6A151	24196140	○
790	830	190	12,5	20	BI-N B6B210	24302398	○
790	850	180	15	30	BI-N B6A151	24342143	○
790	850	220	15	30	BI-N B6A151	532413	○
793	853	190	15	30	BI-N B6A151	24311359	○
795	850	170	15	27,5	BI-N B6B210	24264467	○
795,8	853	215,5	15	28,6	BI-N B6B210	24372361	○
797	852	170	15	27,5	BI-N B6A151	24310598	○
797	852	202	15	27,5	BI-N B6A151	24199549	○

● Available from stock ○ On request: Tool is available, delivery at short notice

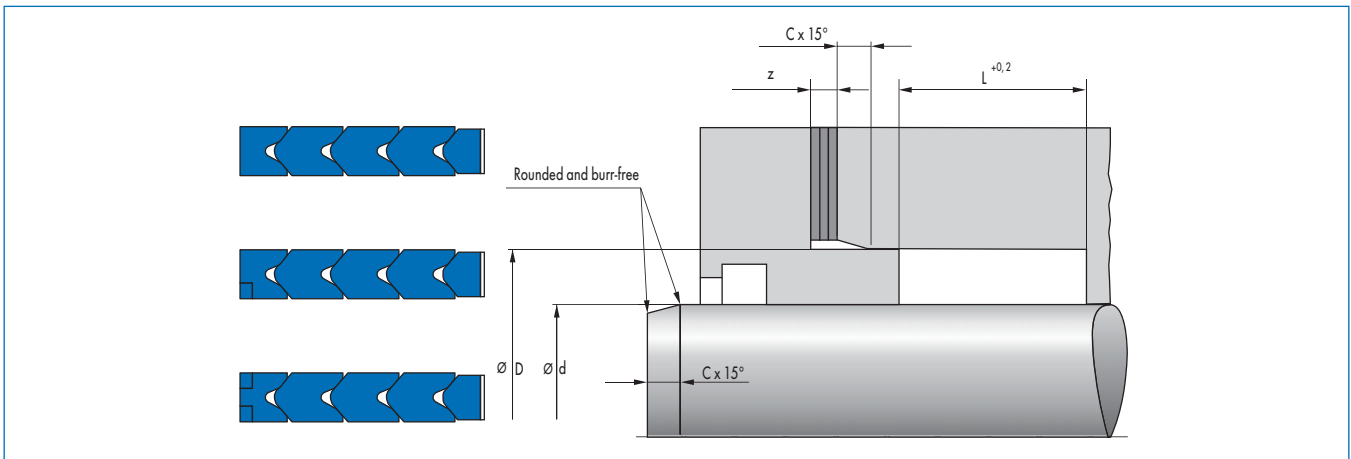


d	D	H	C	Profile	Material	Article No.	
797,2	842,2	200	12,5	22,5	BI-N B6B210	24339121	○
798,5	850,9	169,8	15	26,2	BI-N B6B210	24264681	○
799	853	230	15	27	BI-N B6A151	528941	○
800	840	92	12,5	20	BI-N B6B210	24332370	○
800	840	143	12,5	20	BI-N B6B210	24377819	○
800	840	170	12,5	20	BI-N B6B210	24227463	○
800	850	150	15	25	BI-N B6A151	24378368	○
800	850	166	15	25	BI-N B6B210	24343112	○
800	850	185	15	25	BI-N B6A151	24348887	○
800	850	190	15	25	BI-N B6A151	24259890	○
800	850	190	15	25	BI-N B6B210	24141357	○
800	850	200	15	25	BI-N B6A151	24095200	○
800	850	200	15	25	BI-N B6B210	24097696	○
800	850	230	15	25	BI-N B6B210	24194356	○
800	850	235	15	25	BI-N B6B210	24243659	○
800	860	190	15	30	BI-N B6B210	24288741	○
800,1	850,9	190	15	25,4	BI-N B6B210	24175548	○
803,3	857,3	141,7	15	27	BI-N B6B210	24355848	○
805	860	170	15	27,5	BI-N B6A151	24337977	○
806,5	857,3	166	15	25,4	BI-N B6B210	24342631	○
806,5	863,7	211	15	28,6	BI-N B6B210	24240835	○
809	853,5	170,4	12,5	22,25	BI-N B6A151	24262606	○
809	866,2	209,5	15	28,6	BI-N B6B210	24358439	○
810	860	160	15	25	BI-N B6B210	24237993	○
810	870	205	15	30	BI-N B6B210	24350234	○
812,8	850,9	105,6	12,5	19,05	BI-N B6B210	24263405	○
812,8	857,3	108,9	12,5	22,25	BI-N B6B210	24186967	○
812,8	857,3	141,8	12,5	22,25	BI-N B6B210	24174905	○
812,8	857,3	170,4	12,5	22,25	BI-N B6B210	24264682	○
812,8	857,8	164	12,5	22,5	BI-N B6B210	24183225	○
812,8	857,8	200	12,5	22,5	BI-N B6B210	24186521	○
812,8	863,6	208	15	25,4	BI-N B6B210	24134805	○
812,8	863,6	230	15	25,4	BI-N B6B210	24191478	○
812,8	863,6	240	15	25,4	BI-N B6B210	24179576	○
815	865	200	15	25	BI-N B6B210	24230733	○
819,2	857,3	127,1	12,5	19,05	BI-N B6B210	24296251	○
820	870	185	15	25	BI-N B6B210	24333901	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
820	870	195	15	25	BI-N B6B210	24214211	○
820	870	200	15	25	BI-N B6B210	24350822	○
820	880	230	15	30	BI-N B6B210	24234377	○
824	878	198	15	27	BI-N B6A151	24371128	○
825	875	150	15	25	BI-N B6B210	531138	○
825	875	200	15	25	BI-N B6B210	24291827	○
825,5	876,3	155	15	25,4	BI-N B6B210	24343186	○
828	878	200	15	25	BI-N B6A151	527840	○
830	880	190	15	25	BI-N B6A151	24344986	○
830	880	200	15	25	BI-N B6A151	24095640	○
830	880	200	15	25	BI-N B6B210	24261254	○
830	890	190	15	30	BI-N B6B210	24359689	○
838,2	883,2	200	12,5	22,5	BI-N B6A151	24136488	○
840	890	235	15	25	BI-N B6B210	24084158	○
840	894	150	15	27	BI-N B6A151	527151	○
844,6	889,6	128	12,5	22,5	BI-N B6B210	24306654	○
847	899,4	203,1	15	26,2	BI-N B6B210	24377381	○
850	880	123,4	10	15	BI-N B5B210	24148882	○
850	900	190	15	25	BI-N B6B210	24230005	○
850	900	195	15	25	BI-N B6B210	24094778	○
850	900	200	15	25	BI-N B6B210	24097188	○
850	900	230	15	25	BI-N B6B210	24079681	○
850,9	901,7	176	15	25,4	BI-N B6B210	24267918	○
854	904	240	15	25	BI-N B6B210	24251339	○
860	910	195	15	25	BI-N B6B210	24339538	○
860	910	200	15	25	BI-N B6A151	24100649	○
860	910	200	15	25	BI-N B6B210	24378230	○
860	910	240	15	25	BI-N B6B210	24217402	○
863,6	914,4	134	15	25,4	BI-N B6B210	24332067	○
863,6	914,4	166	15	25,4	BI-N B6B210	24241027	○
870	920	160	15	25	BI-N B6A151	24173923	○
870	920	200	15	25	BI-N B6A151	24360862	○
870	930	230	15	30	BI-N B6B210	24353733	○
875	925	200	15	25	BI-N B6A151	24299462	○
875	925	200	15	25	BI-N B6B210	24083901	○
880	930	195	15	25	BI-N B6B210	24240904	○
882,7	933,5	232	15	25,4	BI-N B6A151	24299504	○
882,7	933,5	240	15	25,4	BI-N B6A151	24299896	○
885,2	939,2	230	15	27	BI-N B6B210	24368685	○
889	939	240	15	25	BI-N B6A151	24257727	○
889	939,8	240	15	25,4	BI-N B6A151	24083454	○
889	943	230	15	27	BI-N B6A151	24372317	○
890	940	190	15	25	BI-N B6B210	49002831	○
890	940	240	15	25	BI-N B6A151	24288233	○
893,6	944,4	129	15	25,4	BI-N B6B210	24375627	○
895	945	190	15	25	BI-N B6B210	24085718	○
895	945	200	15	25	BI-N B6B210	524754	○
895	949	197,7	15	27	BI-N B6B210	24339378	○
899	939	114,2	12,5	20	BI-N B5A151	24193018	○
900	950	166	15	25	BI-N B6B210	24343614	○

● Available from stock ○ On request: Tool is available, delivery at short notice

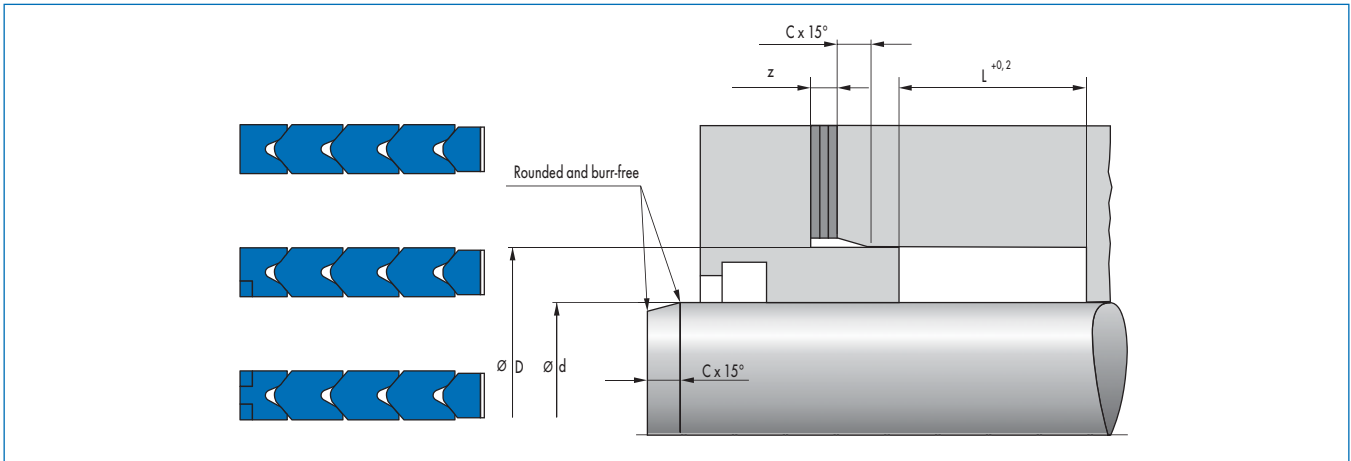


d	D	H	C	Profile	Material	Article No.	
900	950	190	15	25	BI-N B6B210	24220749	○
900	950	195	15	25	BI-N B6B210	24096024	○
900	950	200	15	25	BI-N B6A151	24082187	○
900	950	200	15	25	BI-N B6B210	24145145	○
900	960	190	15	30	BI-N B6A151	24370250	○
901,7	946,7	128	12,5	22,5	BI-N B6B210	24362372	○
905	960	202	15	27,5	BI-N B6A151	24368330	○
909	972,5	190,5	15	31,75	BI-N B6B210	24208983	○
910	960	155	15	25	BI-N B6A151	24372400	○
910	960	176	15	25	BI-N B6A151	24234729	○
910	960	185	15	25	BI-N B6A151	24290872	○
910	960	200	15	25	BI-N B6A151	24260892	○
910	970	98,4	15	30	BI-N B6B210	24336503	○
910	970	190	15	30	BI-N B6B210	24258159	○
914,4	959,4	128	12,5	22,5	BI-N B6B210	24266169	○
914,4	965,2	230	15	25,4	BI-N B6A151	24187112	○
920	965	200	12,5	22,5	BI-N B6B210	24133244	○
920	970	147	15	25	BI-N B6B210	24263048	○
920	970	190	15	25	BI-N B6B210	24195149	○
920	970	192,5	15	25	BI-N B6B210	24078995	○
920	970	200	15	25	BI-N B6A151	24179853	○
920	970	235	15	25	BI-N B6A151	24067553	○
920	970	235	15	25	BI-N B6B210	24116351	○
920	970	240	15	25	BI-N B6B210	24147566	○
920	980	100	15	30	BI-N B6B210	24267778	○
925	965	126	12,5	20	BI-N B6B210	24123320	○
925	965	130,7	12,5	20	BI-N B5A151	24100969	○
925	965	136,4	12,5	20	BI-N B5B210	24292021	○
925	975	150	15	25	BI-N B6B210	527802	○
925	975	195	15	25	BI-N B6B210	24240575	○
925	975	200	15	25	BI-N B6B210	24260983	○
925	975	230	15	25	BI-N B6A151	24068465	○
925	980	170	15	27,5	BI-N B6A151	24379667	○
930	980	185	15	25	BI-N B6A151	24342147	○
930	980	195	15	25	BI-N B6A151	24329098	○
930	984	205,7	15	27	BI-N B6B210	24353065	○
934,2	985	155	15	25,4	BI-N B6B210	24377231	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
935	995	230	15	30	BI-N B6B210	24370240	○
938	990,6	128,4	15	26,2	BI-N B6B210	24343720	○
939,8	990,6	123	15	25,4	BI-N B6B210	24302350	○
940	990	190	15	25	BI-N B6B210	24343341	○
945	1000	170	15	27,5	BI-N B6A151	24239676	○
946,2	991,2	128	12,5	22,5	BI-N B6B210	24268780	○
950	1000	190	15	25	BI-N B6A151	24220704	○
950	1000	195	15	25	BI-N B6B210	24262712	○
950	1000	198	15	25	BI-N B6B210	24308212	○
950	1000	200	15	25	BI-N B6A151	24076810	○
950	1000	200	15	25	BI-N B6B210	24089122	○
950	1000	230	15	25	BI-N B6B210	24188679	○
950	1007,2	211	15	28,6	BI-N B6B210	24260992	○
950	1010	190	15	30	BI-N B6B210	24220472	○
952	1009,2	211	15	28,6	BI-N B6B210	24237259	○
952,4	1009,6	211	15	28,6	BI-N B6A151	24288048	○
952,5	992,5	123,4	12,5	20	BI-N B6B210	24262286	○
956	1010	220,7	15	27	BI-N B6A151	24228478	○
957,3	1009,7	161,7	15	26,2	BI-N B6A151	24357558	○
957,3	1009,7	169,8	15	26,2	BI-N B6A151	24118554	○
959,7	1009,7	166	15	25	BI-N B6A151	24081474	○
960	1010	230	15	25	BI-N B6B210	24192900	○
960	1020	230	15	30	BI-N B6B210	24335109	○
962	1016	204,7	15	27	BI-N B6A151	24250673	○
963,3	1017,3	230	15	27	BI-N B6B210	24240388	○
965	1015	171	15	25	BI-N B6B210	24359579	○
965	1025	230	15	30	BI-N B6B210	24353519	○
965,2	1016	200	15	25,4	BI-N B6A151	24236771	○
970	1010	190	12,5	20	BI-N B6A151	24369150	○
970	1015	200	12,5	22,5	BI-N B6A151	530045	○
970	1020	150	15	25	BI-N B6B210	24369275	○
970	1020	200	15	25	BI-N B6B210	24241332	○
970	1020	230	15	25	BI-N B6B210	24102886	○
970	1020	240	15	25	BI-N B6A151	24080866	○
970	1020	240	15	25	BI-N B6B210	24350502	○
971,6	1016,6	128	12,5	22,5	BI-N B6B210	24244267	○
972,5	1029,7	254	15	28,6	BI-N B6B210	24328803	○
977,9	1034,9	267	15	28,5	BI-N B6B210	24378119	○
979,5	1035	170	15	27,5	BI-N B6A151	24091677	○
980	1030	190	15	25	BI-N B6B210	24295156	○
980	1030	198	15	25	BI-N B6A151	24174648	○
980	1030	200	15	25	BI-N B6B210	24257977	○
980	1030	230	15	25	BI-N B6B210	24246817	○
981,1	1044,6	254,2	15	31,75	BI-N B6B210	24366792	○
984,5	1048	228,6	15	31,75	BI-N B6A151	49004264	○
989	1046,2	254	15	28,6	BI-N B6B210	24264136	○
990,6	1040,6	200	15	25	BI-N B6B210	24336826	○
993	1050	222,5	15	28,5	BI-N B6B210	24343095	○
996,5	1041,5	200	12,5	22,5	BI-N B6A151	24104850	○
998	1048	240	15	25	BI-N B6B210	24373180	○

● Available from stock ○ On request: Tool is available, delivery at short notice

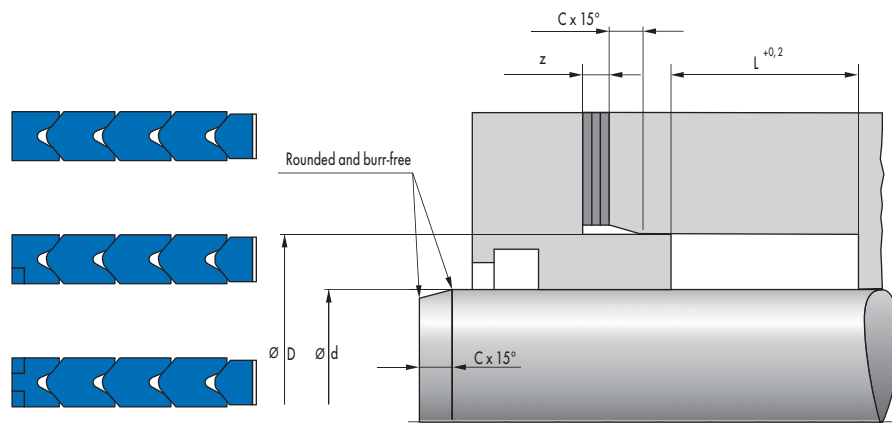


d	D	H	C	Profile	Material	Article No.	
1000	1040	136,4	12,5	20	Bl-N B6B210	24267949	○
1000	1040	150,8	12,5	20	Bl-N B6B210	24244558	○
1000	1040	158	12,5	20	Bl-N B6B210	24147569	○
1000	1050	155	15	25	Bl-N B6B210	24239958	○
1000	1050	190	15	25	Bl-N B6B210	24129229	○
1000	1050	200	15	25	Bl-N B6A151	24116320	○
1000	1050	200	15	25	Bl-N B6B210	24086138	○
1000	1050	200	15	25	Bl-N B6B210	24182397	○
1000	1050	232	15	25	Bl-N B6B210	24196695	○
1000	1050	240	15	25	Bl-N B6B210	24334284	○
1000	1052,4	128,4	15	26,2	Bl-N B6B210	24178276	○
1003,3	1066,8	190,5	15	31,75	Bl-N B6A151	24113960	○
1003,3	1066,8	203,3	15	31,75	Bl-N B6B210	24359050	○
1005	1055	190	15	25	Bl-N B6A151	24378180	○
1005	1055	200	15	25	Bl-N B6A151	24076148	○
1005	1055	230	15	25	Bl-N B6A151	24331235	○
1005	1060	202	15	27,5	Bl-N B6A151	24351697	○
1005	1060	234	15	27,5	Bl-N B6A151	24354971	○
1009,7	1066,9	228,7	15	28,6	Bl-N B6A151	24328458	○
1010	1060	200	15	25	Bl-N B6A151	24100515	○
1010	1060	240	15	25	Bl-N B6A151	24296535	○
1010	1060	240	15	25	Bl-N B6A151	24348850	○
1010	1070	190	15	30	Bl-N B6B210	24292054	○
1016	1070	166	15	27	Bl-N B6B210	24181632	○
1016	1070	212,7	15	27	Bl-N B6A151	24339138	○
1017	1062	164	12,5	22,5	Bl-N B6B210	24332382	○
1020	1060	158	12,5	20	Bl-N B6A151	24366888	○
1020	1070	190	15	25	Bl-N B6B210	24308168	○
1025	1075	200	15	25	Bl-N B6A151	24331034	○
1030	1080	200	15	25	Bl-N B6B210	24096562	○
1030	1090	190	15	30	Bl-N B6A151	24377601	○
1030	1093,5	152,4	15	31,75	Bl-N B6B210	24377755	○
1036	1099,5	228,6	15	31,75	Bl-N B6A151	24348986	○
1039,6	1103,1	228,6	15	31,75	Bl-N B6B210	24314891	○
1040	1090	150	15	25	Bl-N B6B210	527294	○
1040	1090	230	15	25	Bl-N B6B210	24290119	○
1040	1100	230	15	30	Bl-N B6B210	24128707	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
1041,4	1091,4	240	15	25	BI-N B6B210	24373816	○
1041,4	1092,2	123	15	25,4	BI-N B6B210	24215952	○
1045	1095	190	15	25	BI-N B6B210	532553	○
1045	1100	202	15	27,5	BI-N B6B210	24349975	○
1046,7	1101,7	202	15	27,5	BI-N B6A151	24127553	○
1050	1100	150	15	25	BI-N B6B210	24298367	○
1050	1100	200	15	25	BI-N B6A151	24073067	○
1050	1100	240	15	25	BI-N B6B210	24224913	○
1050	1110	190	15	30	BI-N B6A151	24178267	○
1050	1110	230	15	30	BI-N B6B210	24119152	○
1050,9	1101,7	190	15	25,4	BI-N B6B210	24260146	○
1052,1	1098,6	92	15	23,25	BI-N B6A151	24081728	○
1054,1	1094,1	92	12,5	20	BI-N B5B210	24312680	○
1054,1	1104,9	200	15	25,4	BI-N B6B210	24232239	○
1054,1	1111,3	209,5	15	28,6	BI-N B6A151	24112812	○
1060	1110	200	15	25	BI-N B6B210	24106993	○
1060	1110	240	15	25	BI-N B6B210	24259444	○
1060	1120	230	15	30	BI-N B6B210	24355929	○
1062,6	1117,6	170	15	27,5	BI-N B6A151	24375507	○
1063	1115,4	169,8	15	26,2	BI-N B6A151	24259791	○
1065	1125	110	15	30	BI-N B6B210	24268613	○
1065	1125	120	15	30	BI-N B6B210	24172170	○
1065	1125	255	15	30	BI-N B6B210	24343940	○
1065	1128,5	254,2	15	31,75	BI-N B6B210	24330853	○
1066,3	1111,3	128	12,5	22,5	BI-N B6A151	24250793	○
1066,8	1117,6	134	15	25,4	BI-N B6A151	24097943	○
1066,8	1117,6	198	15	25,4	BI-N B6B210	24257816	○
1066,8	1117,6	230	15	25,4	BI-N B6B210	24234460	○
1066,8	1123,8	267	15	28,5	BI-N B6A151	24080781	○
1066,8	1126,8	145	15	30	BI-N B6B210	24263196	○
1067	1117	232	15	25	BI-N B6B210	24238656	○
1070	1120	198	15	25	BI-N B6B210	24144487	○
1070	1120	200	15	25	BI-N B6B210	24247168	○
1070	1120	240	15	25	BI-N B6B210	527844	○
1070,1	1133,6	254,2	15	31,75	BI-N B6B210	24362012	○
1076,3	1130,3	230	15	27	BI-N B6A151	24079273	○
1076,3	1133,5	228,7	15	28,6	BI-N B6A151	24362584	○
1079,5	1136,5	267	15	28,5	BI-N B6B210	24258839	○
1080	1130	232	15	25	BI-N B6B210	24181601	○
1085,9	1136,7	190	15	25,4	BI-N B6B210	531515	○
1085,9	1136,7	195	15	25,4	BI-N B6B210	24297883	○
1090	1140	200	15	25	BI-N B6B210	24267966	○
1090	1150	150	15	30	BI-N B6B210	24293366	○
1090	1150	230	15	30	BI-N B6B210	24237917	○
1095	1140	200	12,5	22,5	BI-N B6B210	24308237	○
1097	1147	166	15	25	BI-N B6A151	24339747	○
1098	1138	178,2	12,5	20	BI-N B6B210	24260894	○
1098,6	1143,6	128	12,5	22,5	BI-N B6B210	24362146	○
1100	1140	92	12,5	20	BI-N B5B210	24330401	○
1100	1150	166	15	25	BI-N B6A151	24231177	○

● Available from stock ○ On request: Tool is available, delivery at short notice

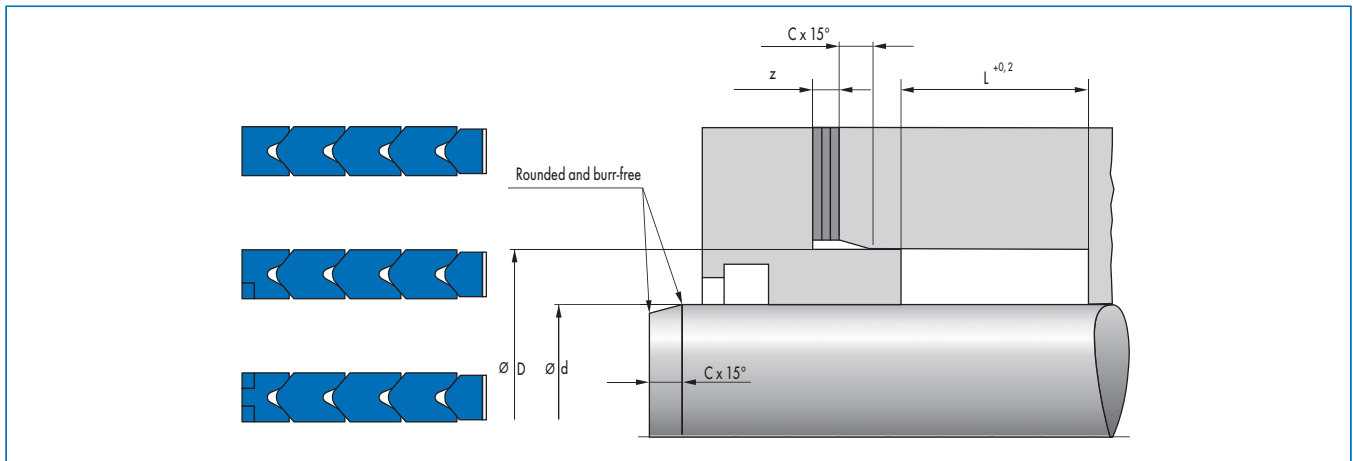


d	D	H	C	Profile	Material	Article No.	
1100	1150	190	15	25	BI-N B6B210	24258316	○
1100	1150	192	15	25	BI-N B6B210	24334775	○
1100	1150	200	15	25	BI-N B6B210	531956	○
1100	1150	240	15	25	BI-N B6B210	24375373	○
1100	1155	202	15	27,5	BI-N B6B210	24302975	○
1100	1160	120	15	30	BI-N B6B210	24342314	○
1100	1160	150	15	30	BI-N B6B210	24308567	○
1100	1160	230	15	30	BI-N B4B210	24335697	○
1104,9	1162	274,6	15	28,55	BI-N B6B210	24142573	○
1109	1163,5	170	15	27,25	BI-N B6B210	24359333	○
1116,8	1174	209,5	15	28,6	BI-N B6A151	24263245	○
1117,6	1157,6	143,6	12,5	20	BI-N B6B210	24261258	○
1117,6	1168,4	120	15	25,4	BI-N B6B210	24341362	○
1117,6	1168,4	134	15	25,4	BI-N B6B210	24101361	○
1117,6	1168,4	166	15	25,4	BI-N B6B210	24376196	○
1117,6	1174,8	228,7	15	28,6	BI-N B6A151	24140474	○
1120	1175	202	15	27,5	BI-N B6A151	24298900	○
1121	1181	250	15	30	BI-N B6B210	24300652	○
1121,5	1171,5	190	15	25	BI-N B6B210	24261174	○
1122	1182	230	15	30	BI-N B6A151	24295015	○
1123	1180	222,5	15	28,5	BI-N B6B210	24227931	○
1123	1183	230	15	30	BI-N B6B210	24227935	○
1124	1174	232	15	25	BI-N B6B210	24342670	○
1125	1165	158	12,5	20	BI-N B6A151	24334503	○
1125	1165	158	12,5	20	BI-N B6B210	24177066	○
1125	1175	166	15	25	BI-N B6A151	24360243	○
1125	1175	166	15	25	BI-N B6B210	24350986	○
1125	1180	170	15	27,5	BI-N B6B210	24243734	○
1125	1182,2	209,5	15	28,6	BI-N B6B210	24293644	○
1125	1182,2	254	15	28,6	BI-N B6B210	24293513	○
1126	1183	222,5	15	28,5	BI-N B6A151	24333773	○
1126	1183	222,5	15	28,5	BI-N B6B210	24265096	○
1128	1180,4	203,1	15	26,2	BI-N B6A151	49004452	○
1129	1179	230	15	25	BI-N B6A151	24264862	○
1130	1170	92	12,5	20	BI-N B5B210	524838	○
1130	1180	200	15	25	BI-N B6A151	24114963	○
1130	1180	200	15	25	BI-N B6B210	24240334	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
1130	1180	230	15	25	BI-N B6A151	24131469	○
1130	1180	240	15	25	BI-N B6B210	24261525	○
1130	1190	230	15	30	BI-N B6A151	24345073	○
1132	1182	176	15	25	BI-N B6B210	24238979	○
1135	1185	200	15	25	BI-N B6B210	24221089	○
1140	1195	170	15	27,5	BI-N B6B210	24342446	○
1140	1200	190	15	30	BI-N B6A151	24330168	○
1140	1200	230	15	30	BI-N B6A151	24242440	○
1143	1193,8	200	15	25,4	BI-N B6B210	24136697	○
1146	1200	205,8	15	27	BI-N B6A151	24222834	○
1147	1202	202	15	27,5	BI-N B6A151	24240392	○
1150	1200	200	15	25	BI-N B6A151	24331570	○
1150	1200	200	15	25	BI-N B6B210	24259601	○
1150	1210	230	15	30	BI-N B6A151	24334683	○
1155	1205	192	15	25	BI-N B6B210	24370895	○
1155,7	1206,5	123	15	25,4	BI-N B6B210	24350823	○
1160	1220	190	15	30	BI-N B6B210	49002402	○
1160	1220	230	15	30	BI-N B6B210	24145531	○
1163	1220,2	184,2	15	28,6	BI-N B6B210	24237989	○
1163	1220,2	228,7	15	28,6	BI-N B6B210	24337806	○
1165	1215	200	15	25	BI-N B6B210	24366916	○
1166,9	1224,1	267,6	15	28,6	BI-N B6B210	24363159	○
1168,4	1219,2	200	15	25,4	BI-N B6B210	24343297	○
1168,4	1219,2	206	15	25,4	BI-N B6B210	24234270	○
1168,4	1225,6	228,7	15	28,6	BI-N B6B210	24332345	○
1168,4	1225,6	254	15	28,6	BI-N B6A151	49003223	○
1168,4	1225,6	273,2	15	28,6	BI-N B6A151	24097438	○
1170	1220	200	15	25	BI-N B6B210	24107499	○
1170	1230	210	15	30	BI-N B6B210	24334130	○
1180	1235	138	15	27,5	BI-N B6B210	24349940	○
1180	1235	170	15	27,5	BI-N B6B210	24334091	○
1195	1245	200	15	25	BI-N B6A151	24361015	○
1200	1250	190	15	25	BI-N B6A151	24267770	○
1200	1250	190	15	25	BI-N B6B210	24085683	○
1200	1250	200	15	25	BI-N B6B210	24075198	○
1200	1260	150	15	30	BI-N B6B210	527490	○
1200	1260	230	15	30	BI-N B6A151	24137108	○
1206,5	1270	209,7	15	31,75	BI-N B6A151	24350653	○
1210	1260	134	15	25	BI-N B6B210	24249176	○
1210	1273,5	228,6	15	31,75	BI-N B6A151	49004267	○
1219,1	1271,5	158,7	15	26,2	BI-N B6A151	24329263	○
1219,2	1270	123	15	25,4	BI-N B6B210	24170559	○
1219,2	1270	200	15	25,4	BI-N B6A151	24175602	○
1219,2	1271,6	169,8	15	26,2	BI-N B6A151	24119656	○
1219,2	1276,4	228,7	15	28,6	BI-N B6A151	24288745	○
1220	1260	190	12,5	20	BI-N B6B210	24239738	○
1220	1280	230	15	30	BI-N B6B210	24267791	○
1222,5	1282,5	230	15	30	BI-N B6B210	529579	○
1225	1275	208	15	25	BI-N B6B210	24234823	○
1225	1280	202	15	27,5	BI-N B6A151	24375249	○

● Available from stock ○ On request: Tool is available, delivery at short notice

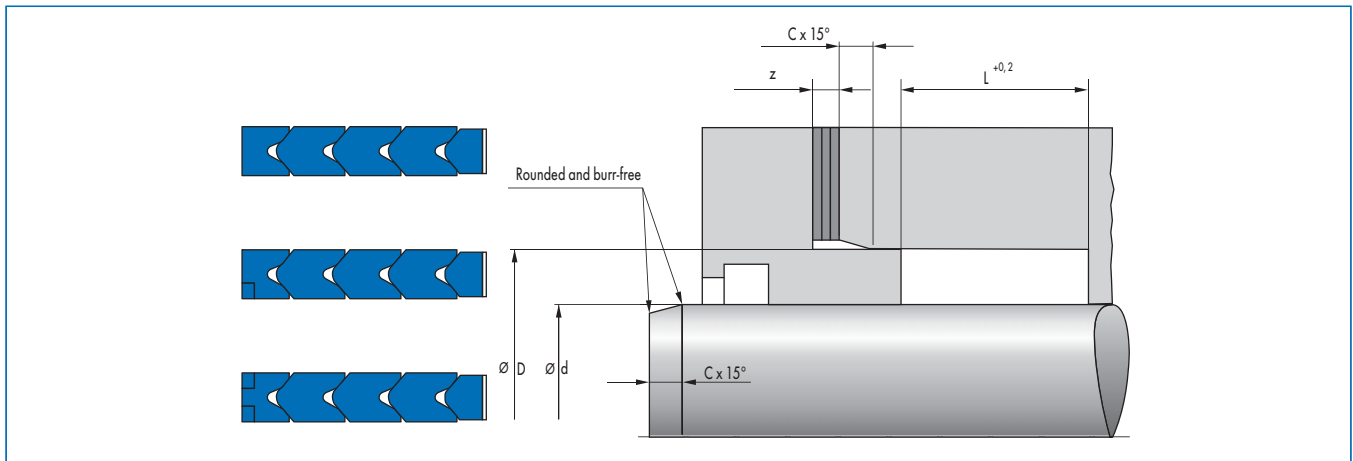


d	D	H	C	Profile	Material	Article No.	
1225	1285	190	15	30	BI-N B6A151	49005205	○
1226	1280	174	15	27	BI-N B6B210	24356095	○
1230	1270	110	12,5	20	BI-N B5B210	528168	○
1230	1280	166	15	25	BI-N B6B210	24348179	○
1230	1280	176	15	25	BI-N B6B210	24344206	○
1230	1280	192	15	25	BI-N B6B210	24236024	○
1230	1280	230	15	25	BI-N B6B210	530996	○
1230	1290	190	15	30	BI-N B6A151	24374033	○
1230	1290	190	15	30	BI-N B6B210	24349950	○
1230	1290	230	15	30	BI-N B6B210	24312116	○
1230,3	1287,5	211,1	15	28,6	BI-N B6A151	24291581	○
1231,9	1282,7	192	15	25,4	BI-N B6A151	24137869	○
1235	1285	200	15	25	BI-N B6B210	24263220	○
1240	1290	200	15	25	BI-N B6A151	24178335	○
1240	1290	240	15	25	BI-N B6B210	532513	○
1240	1300	230	15	30	BI-N B6B210	24137932	○
1240	1300	250	15	30	BI-N B6B210	24183326	○
1243,2	1298,2	170	15	27,5	BI-N B6B210	24358224	○
1245	1297,4	169,8	15	26,2	BI-N B6A151	24187961	○
1248	1308	240	15	30	BI-N B6B210	24298832	○
1250	1300	150	15	25	BI-N B6B210	527800	○
1250	1300	200	15	25	BI-N B6B210	24173519	○
1251	1308,2	254	15	28,6	BI-N B6B210	24232553	○
1260	1300	110	12,5	20	BI-N B5B210	24212921	○
1260	1310	200	15	25	BI-N B6B210	24095757	○
1266,8	1324	209,5	15	28,6	BI-N B6B210	24257818	○
1268	1320,4	161,7	15	26,2	BI-N B6B210	24378200	○
1270	1320	200	15	25	BI-N B6B210	24257632	○
1270	1320	230	15	25	BI-N B6B210	24093634	○
1270	1320,8	134	15	25,4	BI-N B6B210	24173272	○
1270	1330	230	15	30	BI-N B6B210	24334560	○
1285	1335	240	15	25	BI-N B6B210	24373810	○
1288,7	1342,7	166	15	27	BI-N B6B210	24267362	○
1289	1339	230	15	25	BI-N B6A151	24341084	○
1295	1355	250	15	30	BI-N B6B210	24300653	○
1295,4	1346,2	149	15	25,4	BI-N B6B210	24258445	○
1300	1350	190	15	25	BI-N B6B210	49001278	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
1300	1350	200	15	25	BI-N B6B210	24199574	○
1300	1357,2	165	15	28,6	BI-N B6B210	24248356	○
1300	1357,2	209,5	15	28,6	BI-N B6B210	24293514	○
1300	1360	240	15	30	BI-N B6A151	24261978	○
1305	1355	240	15	25	BI-N B6B210	24315736	○
1320	1370	200	15	25	BI-N B6B210	24360154	○
1320	1370	240	15	25	BI-N B6B210	525603	○
1320,8	1373,2	169,8	15	26,2	BI-N B6A151	24342431	○
1322,5	1377,5	170	15	27,5	BI-N B6B210	24333133	○
1325	1375	230	15	25	BI-N B6B210	24244763	○
1340	1400	140	15	30	BI-N B6B210	24104682	○
1346	1400	216,3	15	27	BI-N B6A151	24100249	○
1346,2	1401,2	217,7	15	27,5	BI-N B6A151	24370600	○
1349,6	1400,4	216	15	25,4	BI-N B6A151	24089993	○
1350	1400	152	15	25	BI-N B6B210	24369103	○
1350	1400	200	15	25	BI-N B6B210	24198469	○
1350	1400	230	15	25	BI-N B6B210	24378450	○
1350	1400	240	15	25	BI-N B6B210	24315732	○
1360	1410	200	15	25	BI-N B6A151	24378377	○
1360	1410	200	15	25	BI-N B6B210	24356885	○
1360,3	1430,3	149	15	35	BI-N B6A151	24132615	○
1370	1430	180	15	30	BI-N B6A151	24180183	○
1371,6	1422,4	240	15	25,4	BI-N B6B210	24242040	○
1374	1431,2	169	15	28,6	BI-N B6A151	24342810	○
1375	1430	170	15	27,5	BI-N B6A151	24178268	○
1375	1435	140	15	30	BI-N B6B210	24331982	○
1380	1430	166	15	25	BI-N B6B210	24314231	○
1380	1430	190	15	25	BI-N B6A151	24348888	○
1380	1430	200	15	25	BI-N B6A151	24340271	○
1380	1430	200	15	25	BI-N B6B210	24142545	○
1380	1430	230	15	25	BI-N B6A151	24173720	○
1380	1430	230	15	25	BI-N B6B210	24177187	○
1380	1430,8	160	15	25,4	BI-N B6B210	24196667	○
1380	1432,4	158,7	15	26,2	BI-N B6A151	24108196	○
1380	1434	190	15	27	BI-N B6A151	24116610	○
1380	1440	190	15	30	BI-N B6B210	531928	○
1384,3	1435,1	190	15	25,4	BI-N B6B210	24349941	○
1385	1435	240	15	25	BI-N B6B210	24297822	○
1390,7	1447,8	267,6	15	28,55	BI-N B6A151	24333024	○
1393,7	1453,7	210	15	30	BI-N B6B210	24336197	○
1397	1460,5	209,7	15	31,75	BI-N B6B210	24237013	○
1397	1460,5	254,2	15	31,75	BI-N B6B210	24232709	○
1400	1450	200	15	25	BI-N B6A151	24250631	○
1400	1460	190	15	30	BI-N B6B210	24085195	○
1405	1455	240	15	25	BI-N B6B210	524807	○
1420	1470	200	15	25	BI-N B6A151	24081831	○
1420	1470	240	15	25	BI-N B6B210	24375863	○
1420	1483,5	152,4	15	31,75	BI-N B6B210	24262564	○
1425	1475	190	15	25	BI-N B6B210	24358494	○
1430	1490	250	15	30	BI-N B6B210	528516	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	C	Profile	Material	Article No.	
1447	1497	150	15	25	BI-N B6B210	24307585	○
1447	1497	190	15	25	BI-N B6B210	24295846	○
1447,8	1497,8	230	15	25	BI-N B6B210	24373815	○
1448,5	1503,5	202	15	27,5	BI-N B6A151	24287873	○
1448,5	1512	209,7	15	31,75	BI-N B6A151	24359266	○
1450	1500	190	15	25	BI-N B6B210	24334552	○
1450	1500	200	15	25	BI-N B6B210	49002455	○
1450	1510	210	15	30	BI-N B6B210	24234563	○
1450	1510	230	15	30	BI-N B6B210	24302543	○
1452	1512	210	15	30	BI-N B6A151	24358405	○
1454,1	1511,3	254	15	28,6	BI-N B6B210	24262791	○
1454,3	1514,3	210	15	30	BI-N B6A151	24341797	○
1454,9	1512,1	209,5	15	28,6	BI-N B6A151	24249130	○
1456	1510	230	15	27	BI-N B6A151	24143449	○
1457	1517	255	15	30	BI-N B6B210	24230702	○
1460	1510	200	15	25	BI-N B6A151	24087347	○
1460	1510	200	15	25	BI-N B6B210	532968	○
1460	1520	230	15	30	BI-N B6B210	530835	○
1470	1520	230	15	25	BI-N B6A151	24299585	○
1473,2	1524	149	15	25,4	BI-N B6A151	24179947	○
1480	1530	200	15	25	BI-N B6B210	24370971	○
1482	1542	240	15	30	BI-N B6B210	24306013	○
1490	1560	184	15	35	BI-N B6A151	525042	○
1500	1550	200	15	25	BI-N B6B210	24194257	○
1500	1560	210	15	30	BI-N B6A151	24362972	○
1511,3	1568,5	254	15	28,6	BI-N B6A151	24334902	○
1511,3	1568,5	273,2	15	28,6	BI-N B6A151	24349946	○
1520	1570	200	15	25	BI-N B6A151	24142729	○
1520	1570	200	15	25	BI-N B6A151	24180710	○
1520	1570	200	15	25	BI-N B6B210	24092672	○
1522,4	1585,9	254	15	31,75	BI-N B6A151	24088873	○
1524	1576,4	169,8	15	26,2	BI-N B6A151	24102377	○
1524	1581,2	228,7	15	28,6	BI-N B6A151	24084799	○
1525	1575	200	15	25	BI-N B6B210	24351748	○
1550	1600	200	15	25	BI-N B6A151	24137633	○
1550	1600	200	15	25	BI-N B6B210	24290204	○
1550	1600	240	15	25	BI-N B6B210	24302319	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	C	Profile	Material	Article No.	
1560	1620	255	15	30	BI-N B6A151	531076	○
1568,5	1638,5	219	15	35	BI-N B6A151	24352619	○
1600	1650	200	15	25	BI-N B6A151	24374580	○
1600	1650	240	15	25	BI-N B6B210	24300926	○
1625	1685	210	15	30	BI-N B6A151	24351675	○
1630	1680	200	15	25	BI-N B6A151	24197262	○
1630	1682,4	203,1	15	26,2	BI-N B6A151	24103722	○
1630	1684	213,8	15	27	BI-N B6A151	24328710	○
1630	1687,2	209,5	15	28,6	BI-N B6A151	24350429	○
1650,8	1720,8	219	15	35	BI-N B6B210	24379001	○
1651	1701	120	15	25	BI-N B6B210	24134928	○
1651,1	1701,9	113	15	25,4	BI-N B6B210	530694	○
1651,1	1701,9	124	15	25,4	BI-N B6B210	24143498	○
1660	1720	210	15	30	BI-N B6B210	24302204	○
1663,7	1720,9	209,5	15	28,6	BI-N B6A151	24241328	○
1670	1730	210	15	30	BI-N B6A151	24263417	○
1676,4	1727,2	240	15	25,4	BI-N B6B210	24377802	○
1689,1	1739,9	216	15	25,4	BI-N B6A151	24084005	○
1700	1760	255	15	30	BI-N B6B210	24370764	○
1701,8	1759	209,5	15	28,6	BI-N B6B210	24181197	○
1701,8	1759	228,7	15	28,6	BI-N B6B210	24346859	○
1727,2	1778	134	15	25,4	BI-N B6A151	24094521	○
1727,2	1784,4	273,2	15	28,6	BI-N B6B210	24182245	○
1740	1790	240	15	25	BI-N B6B210	24310409	○
1750	1800	240	15	25	BI-N B6B210	24332511	○
1800	1850	200	15	25	BI-N B6B210	24148688	○
1817,4	1880,9	209,7	15	31,75	BI-N B6A151	24231956	○
1828,8	1886	228,7	15	28,6	BI-N B6A151	24126941	○
1828,8	1886	273,2	15	28,6	BI-N B6A151	528524	○
1830,1	1880,1	166	15	25	BI-N B6B210	24327199	○
1850	1910	255	15	30	BI-N B6B210	24332316	○
1955	2018,5	254	15	31,75	BI-N B6B210	531255	○
1960	2020	250	15	30	BI-N B6A151	24259162	○
1960	2020	250	15	30	BI-N B6B210	527794	○
2000	2060	190	15	30	BI-N B6B210	24082656	○
2000	2060	230	15	30	BI-N B6B210	24294539	○
2450	2510	190	15	30	BI-N B6B210	24378196	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Hat Seal H with Spring

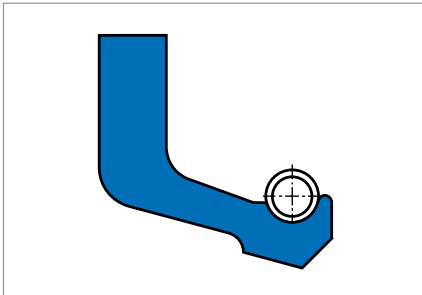


Fig. 1 Merkel Hat Seal H with Spring

Product description

Lip seal, spring-loaded in some cases. Clamping flange for fixing in the housing.

Product advantages

Single-acting rod seal for less important applications and spare parts requirements. We recommend more modern series for new designs.

Application

Standard cylinders.

Material

Material	Code	Hardness
Nitrile rubber NBR	88 NBR 101	88 Shore A

Operating conditions

Material	88 NBR 101
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic ester)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	1
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area Mr >50% to max. 90% at cutting depth c = RZ/2 and reference line C ref = 0%

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The most important factor for the function of the seal is the largest gap dimension encountered during operation on the non-pressurised side of the seal → Technical Manual. $x_2 \leq 0,3$

Tolerance recommendation

The admissible gap width, tolerances, guide play and compressive deflection of the guide under load must be considered for the design of d2.

→ Technical Manual.

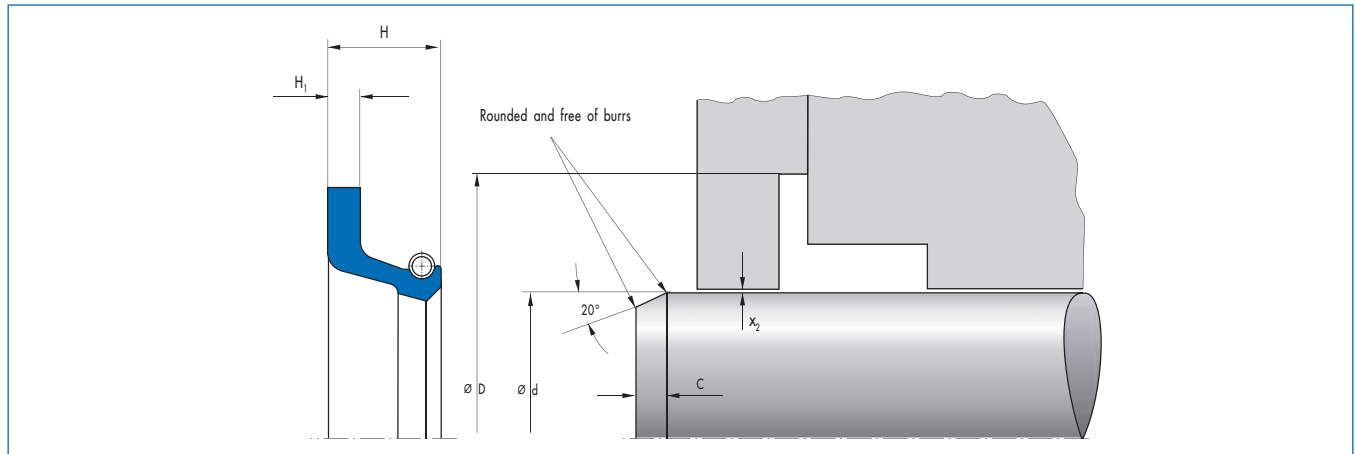
Nominal Ø D	d	D
≤420	f8	H10

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

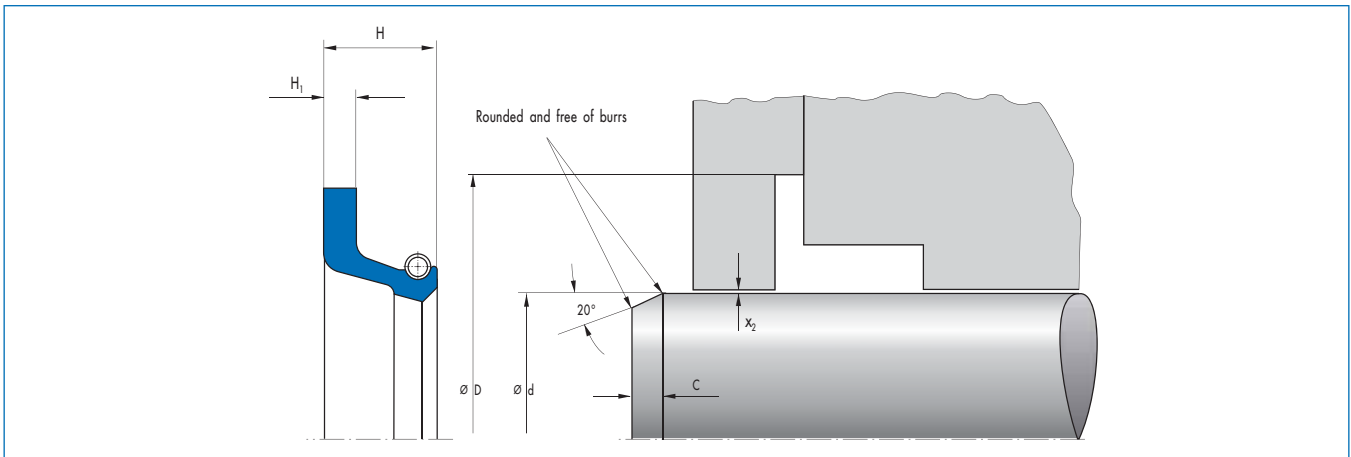
→ Technical Manual.

Article list



d	D	H	H ₁	C	Code	Material	Article No.	
8	20	5	1	3	H8-2	88 NBR M00101	9858	○
10	25	7	2	3	H10-2	88 NBR M00101	9890	●
12	22	6	1,3	3	H12-18	88 NBR M00101	9944	○
12	28	8	2	3	H12-7	88 NBR M00101	9934	○
12	30	9	2	3	H12-16	88 NBR M00101	9942	●
14	33	7	2,5	3	H14-8	88 NBR M00101	9968	●
15	30	8,5	2	3	H15-5	88 NBR M00101	9976	●
15	32	8	2,4	3	H15-7	88 NBR M00101	9978	○
16	31,5	6,5	2	3	H16-17	88 NBR M00101	10007	●
16	35	10	2,5	3	H16-14	88 NBR M00101	10004	●
20	35	7	2	3	H20-1	88 NBR M00101	10030	●
20	40	7	2	3	H20-3	88 NBR M00101	10032	●
20	40	8	2	3	H20-9	88 NBR M00101	10037	●
22	36	8	2,5	3	H22-12	88 NBR M00101	10068	●
22	38	7,5	2,5	3	H22-13	88 NBR M00101	10069	●
22	40	8	2,5	3	H22-1	88 NBR M00101	10058	●
24	45	8	2	3	H24-2	88 NBR M00101	10075	●
25	38	6,5	2	3	H25-14	88 NBR M00101	10095	●
25	40	10	2,5	3	H25-22	88 NBR M00101	10100	○
25	45	9	2	3	H25-26	88 NBR M00101	10105	●
25	50	10	2,5	3	H25-11	88 NBR M00101	10091	●
28	46	6	2,3	3	H28-4	88 NBR M00101	10123	●
30	50	12	3	3	H30-4	88 NBR M00101	10135	●
30	52	10	2,5	3	H30-5	88 NBR M00101	10136	●
30	60	12	3	3	H30-10	88 NBR M00101	10140	○
32	55	10	2,5	3	H32-5	88 NBR M00101	10165	●
35	58	8,5	2,5	3	H35-6	88 NBR M00101	10182	●
35	60	12	3	3	H35-10	88 NBR M00101	10185	○
40	58	8,5	4	3	H40-11	88 NBR M00101	10223	●
40	60	10	2,5	3	H40-5	88 NBR M00101	10218	●
40	67	9,5	2,5	3	H40-1	88 NBR M00101	10214	●
40	70	15	2,5	3	H40-7	88 NBR M00101	10220	●
45	65	8,5	2,5	3	H45-3	88 NBR M00101	10244	●
48	75	12	3	3	H48-3	88 NBR M00101	10253	○
50	70	12	3	3	H50-2	88 NBR M00101	10259	●
50	90	12	3	3	H50-7	88 NBR M00101	10263	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	H ₁	C	Code	Material	Article No.	
55	80	12	2,5	3	H55-2	88 NBR M00101	10277	●
60	85	12	3	3	H60-4	88 NBR M00101	10295	●
60	90	13	3	3	H60-10	88 NBR M00101	10301	○
65	95	13	3	3,5	H65-4	88 NBR M00101	10322	○
65	105	12	3	3,5	H65-1	88 NBR M00101	10319	●
70	98	12	3	3,5	H70-3	88 NBR M00101	10332	●
70	110	13	3	3,5	H70-4	88 NBR M00101	10333	○
75	115	12	2,5	3,5	H75-2	88 NBR M00101	10345	●
78	106	12	3,5	4	H78-1	88 NBR M00101	10352	○
80	120	15	3	4	H80-2	88 NBR M00101	10356	○
85	105	10	3	4	H85-1	88 NBR M00101	10367	○
90	120	13,5	3,5	4	H90-1	88 NBR M00101	10374	●
100	130	13	3	4	H100-4	88 NBR M00101	10390	●
105	130	10	2,5	4	H105-1	88 NBR M00101	10394	○
110	130	12	3	4	H110-2	88 NBR M00101	10398	○
120	175	20	4	4	H120-1	88 NBR M00101	10409	○
130	150	12	3	5,5	H130-3	88 NBR M00101	10418	○
140	170	12	2,5	5,5	H140-5	88 NBR M00101	10429	●
150	190	14	4	5,5	H150-3	88 NBR M00101	10437	○
160	200	17	3	5,5	H160-1	88 NBR M00101	10442	●
170	200	12	3	5,5	H170-2	88 NBR M00101	10448	○
180	212	14	4	5,5	H180-4	88 NBR M00101	10458	●
190	215	15	3	5,5	H190-1	88 NBR M00101	10463	○
200	230	15	3	5,5	H200-4	88 NBR M00101	10471	○
200	240	15	3	5,5	H200-1	88 NBR M00101	10469	○
220	270	15	3	5,5	H220-2	88 NBR M00101	10480	○
225	270	15	3	5,5	H225-4	88 NBR M00101	10484	○
240	299	20	3	5,5	H240-1	88 NBR M00101	10489	○
250	310	14	4	5,5	H250-1	88 NBR M00101	10492	○
280	330	12	3	6,5	H280-1	88 NBR M00101	10500	○
300	356	20	5	7	H300-1	88 NBR M00101	10504	○
320	360	20	3	8	H320-1	88 NBR M00101	10509	○
330	390	20	3	8	H330-1	88 NBR M00101	10511	○
350	400	18	5	8	H350-1	88 NBR M00101	10516	○
400	450	15	3	8	H400-1	88 NBR M00101	10526	○
420	470	18	4	8	H420-1	88 NBR M00101	10532	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Hat Seal H without Spring

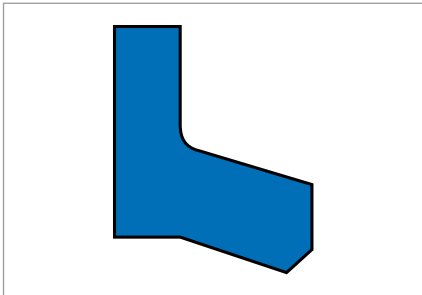


Fig. 1 Merkel Hat Seal H without Spring

Product description

Lip seal. Clamping flange for fixing in the housing.

Product advantages

Single-acting rod seal for less important applications and spare parts requirements. We recommend more modern series for new designs.

Application

Standard cylinders.

Material

Material	Code	Hardness
Nitrile rubber NBR	88 NBR 101	88 Shore A

Operating conditions

Material	88 NBR 101
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic ester)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	1
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area Mr >50% up to max. 90% at cutting depth c = RZ/2 and reference line C ref = 0%

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The most important characteristic for the function of the seal is the largest gap dimension encountered during operation on the non-pressurised side of the seal → Technical Manual. $x_2 \leq 0,3$

Tolerance recommendation

The admissible gap width, tolerances, guide play and compressive deflection of the guide under load must be considered for the design of d2.

→ Technical Manual.

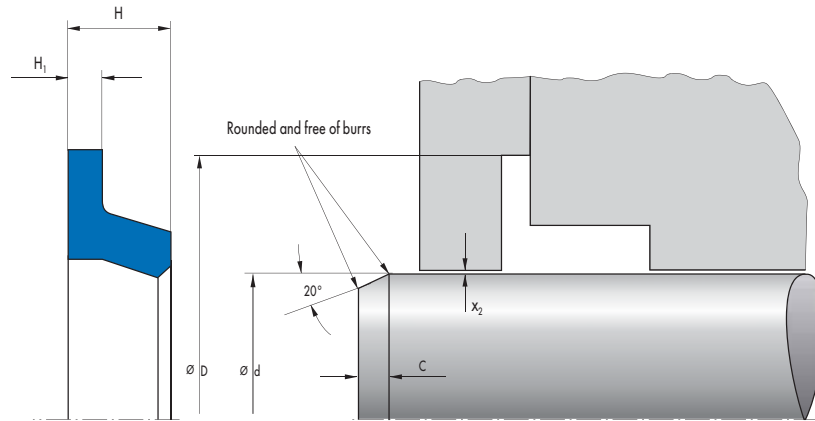
Nominal Ø D	d	D
≤420	f8	H10

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



d	D	H	H ₁	C	Code	Material	Article No.	
3	8,5	5	2,3	3	H3-3	88 NBR M00101	9816	○
5	20	6	1,5	3	H5-1	88 NBR M00101	9824	○
6	12	4	1	3	H6-7	88 NBR M00101	9836	●
6	15	4,5	1,5	3	H6-6	88 NBR M00101	9835	●
7	12	4	0,9	3	H7-6	88 NBR M00101	9851	●
8	14	6	1,5	3	H8-7	88 NBR M00101	9861	●
8	18	5	1,5	3	H8-3	88 NBR M00101	9859	●
9	16	4,5	1,5	3	H9-2	88 NBR M00101	9878	○
10	16	5	2	3	H10-10	88 NBR M00101	9899	○
10	18	5	1,5	3	H10-3	88 NBR M00101	9893	●
10	20	6	2	3	H10-6	88 NBR M00101	9896	●
10	30	8	2,3	3	H10-7	88 NBR M00101	9897	●
12	20	5,5	1,5	3	H12-15	88 NBR M00101	9941	○
12	22	5	1,6	3	H12-10	88 NBR M00101	9937	○
12	22	6	1	3	H12-9	88 NBR M00101	9936	○
12	32	6	2	3	H12-6	88 NBR M00101	9933	●
13	22	5,5	2	3	H13-5	88 NBR M00101	9954	○
14	22	5,5	1,5	3	H14-10	88 NBR M00101	9969	●
14	24	7	2	3	H14-4	88 NBR M00101	9965	●
14	30	7	2	3	H14-2	88 NBR M00101	9964	●
15	25,8	8	2	3	H15-4	88 NBR M00101	9975	●
16	32	7	2	3	H16-7	88 NBR M00101	9998	●
17	30	6	1,5	3	H17-1	88 NBR M00101	10009	●
18	26	5,5	1,5	3	H18-10	88 NBR M00101	10018	●
18	32	7	2	3	H18-8	88 NBR M00101	10017	●
20	30	8	3	3	H20-10	88 NBR M00101	10038	●
20	32	6	1,5	3	H20-5	88 NBR M00101	10033	●
20	35	7	2	3	H20-26	88 NBR M00101	10047	●
20	38	10	3,5	3	H20-6	88 NBR M00101	10034	●
20	38	12	3	3	H20-8	88 NBR M00101	10036	●
22	34	6	2	3	H22-6	88 NBR M00101	10062	●
22	44	12	2,5	3	H22-9	88 NBR M00101	10065	○
25	38	10	2,5	3	H25-7	88 NBR M00101	10089	●
25	42	5,5	1,5	3	H25-10	88 NBR M00101	10090	●
25	45	10	2,5	3	H25-13	88 NBR M00101	10094	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	H ₁	C	Code	Material	Article No.	
25	45	12	3	3	H25-12	88 NBR M00101	10093	●
25	55	12	3	3	H25-2	88 NBR M00101	10086	○
28	42	9,5	2,5	3	H28-8	88 NBR M00101	10126	●
28	49	13	3	3	H28-3	88 NBR M00101	10122	○
30	48	9	2,5	3	H30-6	88 NBR M00101	10137	●
30	50	13	3,5	3	H30-9	88 NBR M00101	10139	●
32	51	15	3,5	3	H32-6	88 NBR M00101	10167	●
35	48	7	2,5	3	H35-13	88 NBR M00101	10186	○
35	60	15	3	3	H35-5	88 NBR M00101	10181	○
35	60	15	3	3	H35-7	88 NBR M00101	10183	●
36	59,8	10	2,5	3	H36-5	88 NBR M00101	10195	○
38	58	10	2,5	3	H38-1	88 NBR M00101	10201	○
40	65	9,5	3	3	H40-9	88 NBR M00101	10222	●
40	66	10	3	3	H40-3	88 NBR M00101	10216	●
40	70	16	4	3	H40-8	88 NBR M00101	10221	●
42	74	15	4	3	H42-2	88 NBR M00101	10234	○
44	56	6	2,5	3	H44-5	88 NBR M00101	10240	○
44	60	8	2,5	3	H44-3	88 NBR M00101	10239	○
45	70	12	3	3	H45-5	88 NBR M00101	10247	●
45	75	8	2	3	H45-4	88 NBR M00101	10246	○
50	76	10	3	3	H50-1	88 NBR M00101	10258	●
50	80	16	4	3	H50-5	88 NBR M00101	10262	○
55	90	15	4	3	H55-4	88 NBR M00101	10280	○
60	90	12	3	3	H60-7	88 NBR M00101	10297	●
65	90	12	4	3,5	H65-2	88 NBR M00101	10320	○
70	90	10	2,5	3,5	H70-6	88 NBR M00101	10335	●
80	108	15	4	4	H80-1	88 NBR M00101	10355	○
100	124	10	4	4	H100-2	88 NBR M00101	10388	○
120	148	15	6	4	H120-3	88 NBR M00101	10410	○
125	140	6,8	1,5	5,5	H125-1	88 NBR M00101	10412	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Forseal FOI made of PTFE

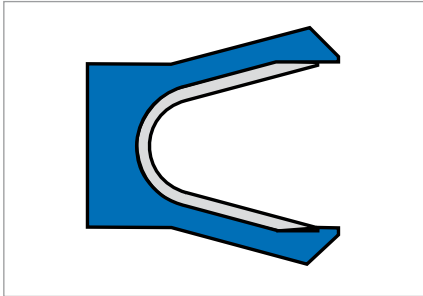


Fig. 1 Forseal FOI made of PTFE

Product description

Single acting, U-ring type PTFE seal with metal tension spring.

Product advantages

Axially moving rod seal, interchangeable for O-ring housings (ARP568, MIL-P-5514)

- Extremely media and temperature resistant
- Good dry running properties
- Low static and dynamic friction values.

Application

Hot water valves, accumulators, hydraulic and pneumatic cylinders as well as applications in food processing, medical and chemical technology.

Design notes

Beside the default dimensions, all special dimensions considering the U-ring profiles are available on request without surcharge for the tool. Dimensions available from Ø 5 mm (rod) to approx. 2000 mm. In general, installation is only possible in split, axially accessible grooves. Installation in half-open grooves possible in exceptional cases. → Technical Manual.

Material

Material	Code	Tension spring
Carbon-filled PTFE	PTFE 10/F56110	Standard stainless steel (part no. 1.4310)

Operating conditions

Material	PTFE 10/F56110 + 1.4310
Temperature range in °C	
Hydraulic fluids, oil, water, steam, air, solvents, pharmaceutical goods, foodstuffs or all media that do not attack PTFE and stainless steel	-200 ... +260
Pressure p in MPa	30
Running speed v in m/s	15

Material	PTFE 10/F56110 +spring Hastelloy C276 (Not available ex-works)
Temperature range in °C	
Aggressive acids and alkalis	-200 ... +260
Pressure p in MPa	30
Running speed v in m/s	15

Rotary and pivoting motions possible. No rotation. → Technical Manual.

Surface quality

Sealing surfaces, dynamic/static: → Fig. 2

Lead-in chamfers: $R_a < 1,6 \mu\text{m}$

Sides of groove: $R_a < 2,5 \mu\text{m}$

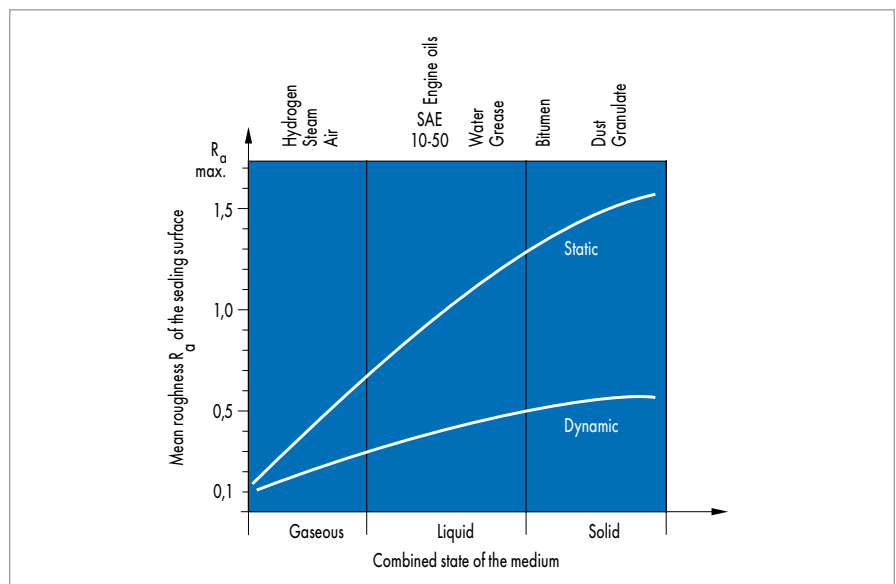
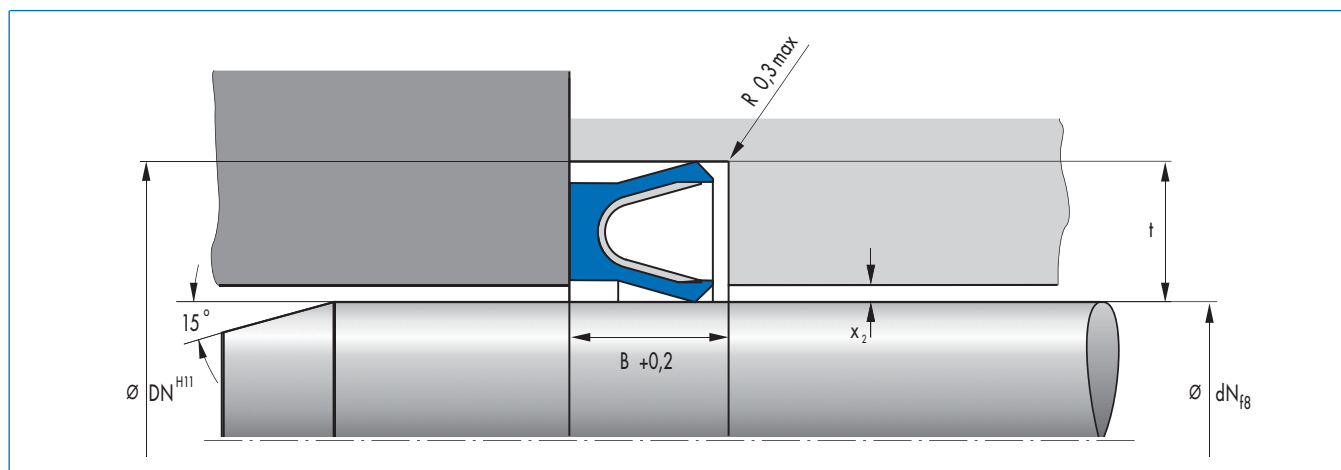


Fig. 2 Surface recommendation for sealing surfaces

Article list



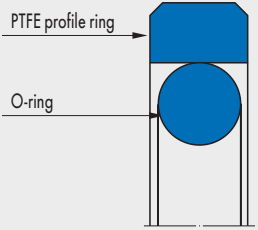
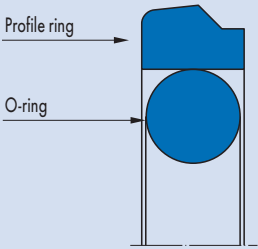
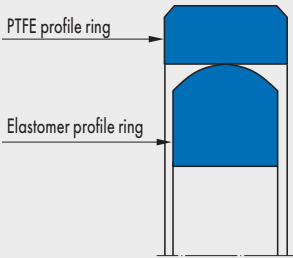
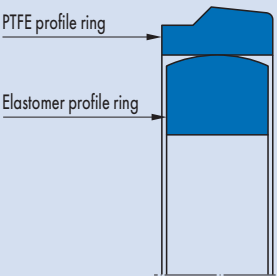
d _N	D _N	h	t	x _{2 max}	Interchangeable for O-Ring	B+0,2	Material	Article No.	
5	7,9	2,1	1,45	0,07	1,78	2,4	PTFE F56110	422362	●
6	8,9	2,1	1,45	0,07	1,78	2,4	PTFE F56110	469398	●
8	10,9	2,1	1,45	0,07	1,78	2,4	PTFE F56110	435977	●
10	12,9	2,1	1,45	0,07	1,78	2,4	PTFE F56110	435975	●
10	14,5	3,2	2,25	0,08	2,62	2,4	PTFE F56110	366345	●
12	16,5	3,2	2,25	0,08	2,62	3,6	PTFE F56110	164660	●
14	18,5	3,2	2,25	0,08	2,62	3,6	PTFE F56110	366346	●
16	20,5	3,2	2,25	0,08	2,62	3,6	PTFE F56110	422359	●
18	22,5	3,2	2,25	0,08	2,62	3,6	PTFE F56110	365876	●
20	24,5	3,2	2,25	0,08	2,62	3,6	PTFE F56110	366348	●
22	28,2	4,3	3,1	0,1	3,53	4,8	PTFE F56110	422373	●
25	31,2	4,3	3,1	0,1	3,53	4,8	PTFE F56110	366349	●
28	34,2	4,3	3,1	0,1	3,53	4,8	PTFE F56110	366350	●
28	34,2	4,3	3,1	0,1	3,53	4,8	PTFE F56110	49029924	○
30	36,2	4,3	3,1	0,1	3,53	4,8	PTFE F56110	366351	●
32	38,2	4,3	3,1	0,1	3,53	4,8	PTFE F56110	366352	●
36	42,2	4,3	3,1	0,1	3,53	4,8	PTFE F56110	366353	●
40	46,2	4,3	3,1	0,1	3,53	4,8	PTFE F56110	366354	●
45	54,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366355	●
48	57,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	389790	○
50	59,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366356	●
55	64,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	379672	○
56	65,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	434452	●
60	69,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366357	●
63	72,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366358	●
63	72,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	433995	○
65	74,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	382322	●
70	79,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366359	●
72	81,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	433998	○
80	89,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366360	●
90	99,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	162680	○
90	99,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	386511	●
100	109,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366361	●
125	137,2	9	6,1	0,15	7	9,5	PTFE F56110	160404	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Pre-Selection Hydraulics – Piston Seals

Temperature figures refer to mineral oils. Due to the large choice of media with different and varying additives, which is not always easily comprehensible, the above operating limits are only recommended values. We recommend testing resistance in the specific case.

Individual instances of the operating limits stated may be exceeded taking into account the related operating conditions. With a long duty cycle, stop-start operation or other difficult operating conditions it is recommended that these values are not simultaneously exploited to the full.

Seal		Standard	
Type	Material	DIN/ISO	Examples of use
<p>Merkel Omegat OMK-MR</p>  <p>PTFE profile ring</p> <p>O-ring</p>	<p>PTFE bronze NBR PTFE bronze FKM PTFE glass NBR</p>	<p>7425 Teil 1</p>	<p>Suitable for rapid pressure change, low friction, free of stick-slip, high temperature resistance.</p>
<p>Merkel Omegat OMK-E</p>  <p>Profile ring</p> <p>O-ring</p>	<p>PTFE bronze NBR PTFE bronze FKM PTFE glass NBR</p>	<p>based on 7425/1</p>	<p>Very high pressure resistance and hardness, low friction, free of stick-slip, high temperature resistance.</p>
<p>Merkel Omegat OMK-S</p>  <p>PTFE profile ring</p> <p>Elastomer profile ring</p>	<p>PTFE glass NBR</p>		<p>Suitable for rapid pressure change and heavy duty hydraulic applications, low friction, free of stick-slip, high temperature resistance.</p>
<p>Merkel Omegat OMK-ES</p>  <p>PTFE profile ring</p> <p>Elastomer profile ring</p>	<p>PTFE glass NBR</p>		<p>Suitable for heavy duty hydraulic applications, low friction, free of stick-slip, high temperature resistance.</p>

● = very good; ◐ = good; ○ = possible or satisfactory; ⊗ = not suitable

	Function					Operating Limits		
	single-acting	double-acting	Individual seal	Primary seal	Secondary seal	Pressure (MPa)	Speed (m/s)	Temperature (°C)
	⊗	●				40	5,0	-30 ... +100
	●	⊗				40	5,0	-30 ... +100
	⊗	●				40	5,0	-30 ... +100
	●	⊗				40	5,0	-30 ... +100

Seal		Standard		
Type	Material	DIN/ISO	Examples of use	
<p>Merkel U-Ring T 18</p> <p>Asymmetrical sealing lip POM back-up ring PUR profile ring</p>	95 AU V142/POM	5597	Single-acting, for high pressures and large gap widths.	
<p>Merkel U-Ring TM 21</p> <p>PU profile ring Sealing lip</p>	95 AU V142		Good static and dynamic tightness, specifically for special sizes.	
<p>Merkel U-Ring TMP 21</p> <p>PUR profile ring Sealing lips</p>	93 AU V167		Specifically for pneumatic applications.	
<p>Merkel U-Ring NA 300</p> <p>PU profile ring Asymmetrical sealing lips</p>	94 AU 925	5597	Single-acting, optimal price/performance ratio.	
<p>Merkel Compact Seal Simko 300</p> <p>PU profile ring NBR profile ring</p>	98 AU 928/NBR	based on 7425/1	Double-acting, optimal price/performance ratio.	

● = very good; ◐ = good; ○ = possible or satisfactory; ⊗ = not suitable

	Function					Operating Limits		
	single-acting	double-acting	Individual seal	Primary seal	Secondary seal	Pressure (MPa)	Speed (m/s)	Temperature (°C)
	●	⊗				50	0,5	-30 ... +110
	●	⊗				40	0,5	-30 ... +110
	●	⊗				2	1,5	
	●	⊗				40	0,5	-30 ... +110
	⊗	●				40	0,5	-30 ... +110

Merkel U-Ring NA 150

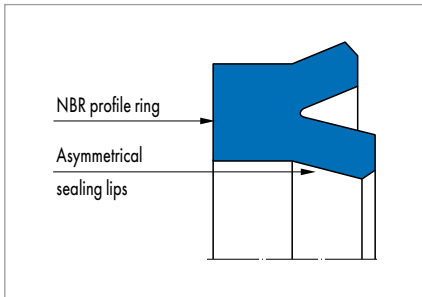


Fig. 1 Merkel U-ring NA 150

Product description

Merkel U-ring with asymmetrical profile of the sealing lips.

Product advantages

Single-acting piston seal, preferably for spare parts requirement.

Application

Earth moving equipment, industrial vehicles, agricultural machinery.

We recommend more modern series for new designs.

Material

Profile ring

Material	Code	Hardness
Nitrile rubber NBR	80 NBR 878	80 Shore A

Operating conditions

Material	80 NBR 878
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	10
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M, >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Profile	Max. permissible gap dimension			
	2,5 MPa	5 MPa	7,5 MPa	10 MPa
≤5	0,45	0,30	0,25	0,20
>5	0,50	0,35	0,30	0,25

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

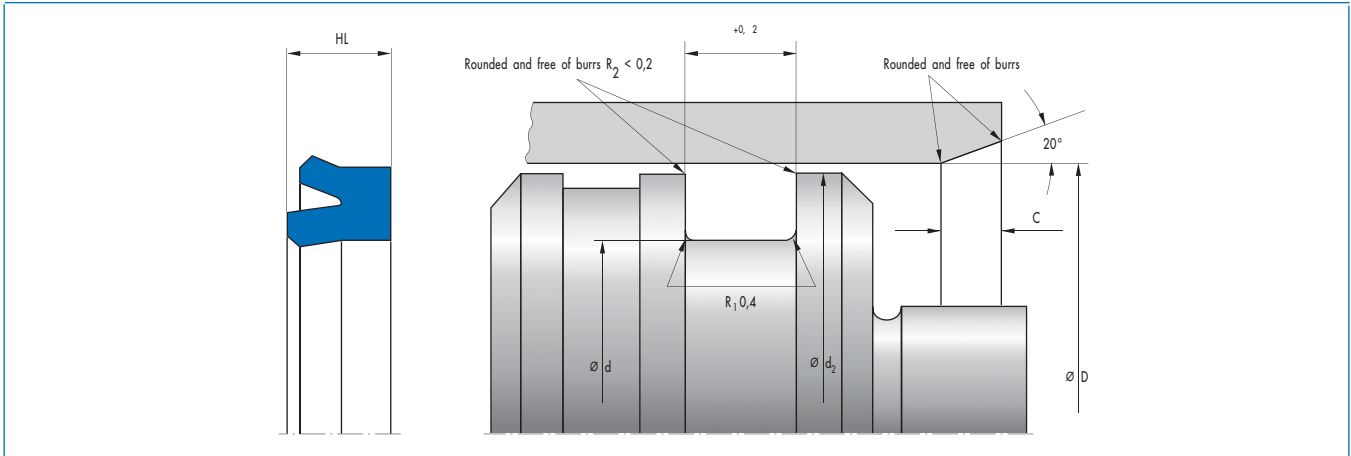
Nominal Ø D	D	d
≤200	H11	h11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



D	d	H	L	Profile	C	Fitting	Housing	Material	Article No.	
12	6	4	4,5	3	2,5			80 NBR M00878	84515	●
16	10	4	4,5	3	2,5			80 NBR M00878	84516	●
20	12	5,5	6	4	4		ISO	80 NBR M00878	84517	●
25	17	5,5	6	4	4,5	H	ISO	80 NBR M00878	84518	●
32	24	5,5	6	4	4,5	H	ISO	80 NBR M00878	84519	●
40	30	7	7,5	5	4,5	H	ISO	80 NBR M00878	84520	●
50	40	7	7,5	5	4,5	H	ISO	80 NBR M00878	84521	●
63	53	7	7,5	5	4,5	H	ISO	80 NBR M00878	84522	●
70	58	8,5	9,5	6	5	H		80 NBR M00878	84523	●
80	68	8,5	9,5	6	5	H		80 NBR M00878	84524	●
100	88	8,5	9,5	6	5	H		80 NBR M00878	84525	●
125	110	10	11	7,5	5,5	H		80 NBR M00878	84526	●
140	125	10	11	7,5	5,5	H		80 NBR M00878	84527	●
160	145	10	11	7,5	5,5	H		80 NBR M00878	84528	●
180	160	14	15	10	6	H		80 NBR M00878	84529	●
200	180	14	15	10	6	H		80 NBR M00878	84530	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring NA 250

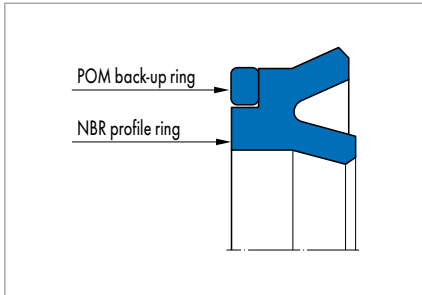


Fig. 1 Merkel U-Ring NA 250

Product description

Merkel U-ring with asymmetrical profile of the sealing lips and back-up ring as a gap sealing component.

Product advantages

Single-acting piston seal for medium load, preferably for spare parts requirement.

Application

Standard cylinders, earth moving equipment, forestry equipment, excavators. We recommend more modern series for new designs.

Material

Sealing component

Material	Code	Hardness
Nitrile rubber NBR	80 NBR 878	80 Shore A

Back-up ring

Material	Code
Polyacetal	POM 992020

Operating conditions

Material	80 NBR 878/POM
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	25
Running speed v in m/s	0,5

Surface quality

Surface roughness	R_a	R_{max}
Sliding surface	0,05 ... 0,3 μm	$\leq 2,5 \mu\text{m}$
Groove base	$\leq 1,6 \mu\text{m}$	$\leq 6,3 \mu\text{m}$
Groove flanks	$\leq 3,0 \mu\text{m}$	$\leq 15,0 \mu\text{m}$

Percentage contact area M_c , >50% to max. 90% at cutting depth $c = R_z/2$ and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Profile	Max. permissible gap dimension		
	7,5 MPa	10 MPa	25 MPa
≤80	0,95	0,80	0,60
>80	1,00	0,85	0,65

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

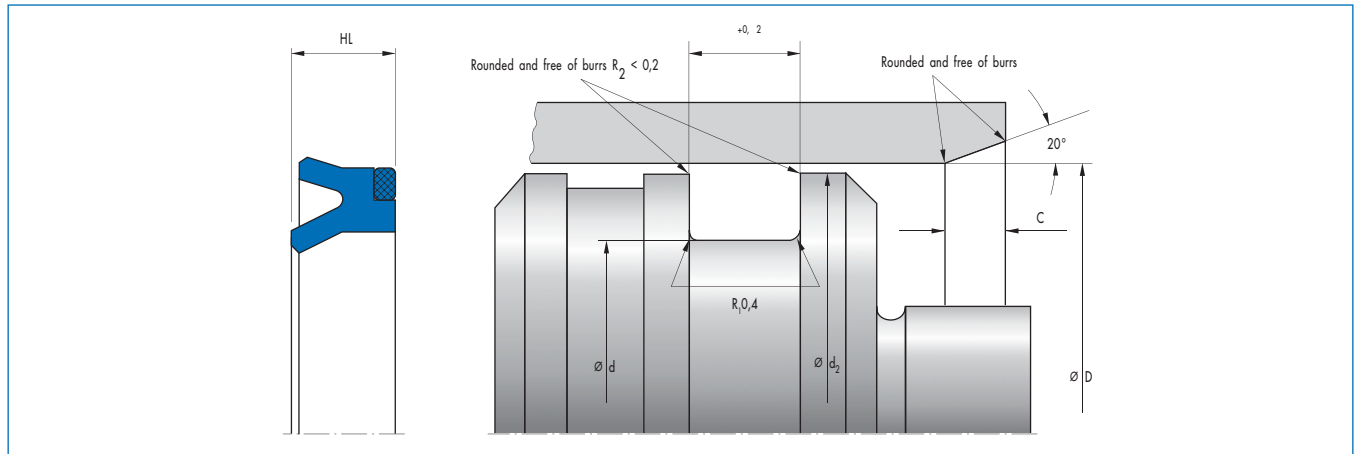
Nominal Ø D	D	d
≤180	H11	h11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

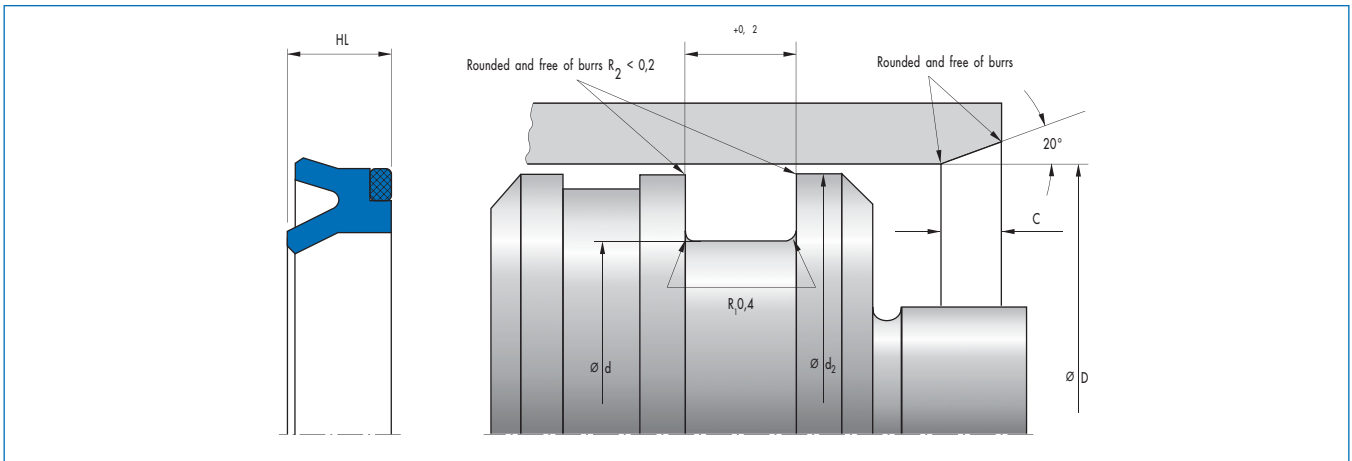
Article list



D	d	H	L	Profile	C	Fitting	Housing	Material	Article No.	
32	20	10	11	6	5			80 NBR M00878	4429	○
35	22	10	11	6,5	5,5			80 NBR M00878	18426	○
38	25	10	11	6,5	5,5			80 NBR M00878	18429	○
40	25	10	11	7,5	5,5			80 NBR M00878	18432	●
42	22	10	11	10	6			80 NBR M00878	32166	●
42	30	10	11	6	5			80 NBR M00878	18434	○
45	30	10	11	7,5	5,5			80 NBR M00878	18436	○
50	30	12	13	10	6			80 NBR M00878	18443	○
50	35	10	11	7,5	5,5	W		80 NBR M00878	18442	●
55	40	10	11	7,5	5,5	W		80 NBR M00878	18446	●
60	40	12	13	10	6			80 NBR M00878	18450	○
60	45	10	11	7,5	5,5	W		80 NBR M00878	18449	●
63	45	12	13	9	6			80 NBR M00878	18451	●
65	45	12	13	10	6			80 NBR M00878	18453	○
65	50	10	11	7,5	5,5	W		80 NBR M00878	18452	●
70	50	12	13	10	6			80 NBR M00878	18457	○
70	55	12	13	7,5	5,5	W		80 NBR M00878	18456	●
75	60	12	13	7,5	5,5	W		80 NBR M00878	18460	○
80	60	12	13	10	6		ISO	80 NBR M00878	18466	●
80	65	12	13	7,5	5,5	W	ISO	80 NBR M00878	18465	●
82	65	12	13	8,5	6			80 NBR M00878	18467	○
85	70	12	13	7,5	5,5	W		80 NBR M00878	18469	●
90	70	12	13	10	6			80 NBR M00878	18476	○
90	75	12	13	7,5	5,5	W		80 NBR M00878	18475	●
95	75	12	13	10	6	W		80 NBR M00878	18478	○
100	80	15	16	10	6	W	ISO	80 NBR M00878	18479	●
100	85	12	13	7,5	5,5	W		80 NBR M00878	18480	●
105	85	15	16	10	6	W		80 NBR M00878	18484	●
105	90	12	13	7,5	5,5	W		80 NBR M00878	18481	●
110	85	15	16	12,5	6,5			80 NBR M00878	17614	○
110	90	15	16	10	6	W		80 NBR M00878	18486	○
110	95	12	13	7,5	5,5	W		80 NBR M00878	18485	●
115	90	15	16	12,5	6,5			80 NBR M00878	18491	○
120	95	15	16	12,5	6,5			80 NBR M00878	18496	○
120	100	15	16	10	6	W		80 NBR M00878	18494	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing



D	d	H	L	Profile	C	Fitting	Housing	Material	Article No.	
125	100	15	16	12,5	6,5		ISO	80 NBR M00878	18501	○
125	105	15	16	10	6	W	ISO	80 NBR M00878	18498	●
130	110	15	16	10	6	W		80 NBR M00878	18504	○
140	115	15	16	12,5	6,5	W		80 NBR M00878	17613	●
140	125	15	16	7,5	5,5	W		80 NBR M00878	2920	○
160	135	18	19	12,5	6,5	W	ISO	80 NBR M00878	21094	○
180	160	15	16	10	6	W		80 NBR M00878	29462	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring NA 300

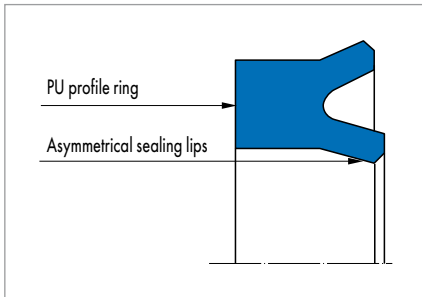


Fig. 1 Merkel U-Ring NA 300

Product description

Merkel U-ring with asymmetrical profile, outer lip set back and press fit at the inside diameter.

Product advantages

Single-acting piston seal for standardised housings, amongst others, according to ISO 5597

- Very good static and dynamic tightness.

Application

Earth moving equipment, support cylinders, presses.

Material

Material	Code	Hardness
Polyurethane	94 AU 925	94 Shore A

Operating conditions

Material	94 AU 925
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +40
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +40
Mineral greases	-30 ... +110
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R_a	R_{max}
Sliding surface	0,05 ... 0,3 μm	$\leq 2,5 \mu\text{m}$
Groove base	$\leq 1,6 \mu\text{m}$	$\leq 6,3 \mu\text{m}$
Groove flanks	$\leq 3,0 \mu\text{m}$	$\leq 15,0 \mu\text{m}$

Percentage contact area M_v >50% to max. 90% at cutting depth $c = R_z/2$ and reference line $C_{ref} = 0\%$.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Profile	Max. permissible gap dimension			
	16 MPa	26 MPa	32 MPa	40 MPa
4,0 ... 5,0	0,50	0,40	0,35	0,30
>5,0 ... 7,5	0,55	0,45	0,40	0,35
>7,5 ... 11,0	0,66	0,50	0,45	0,40

Tolerance recommendation and dimension d2

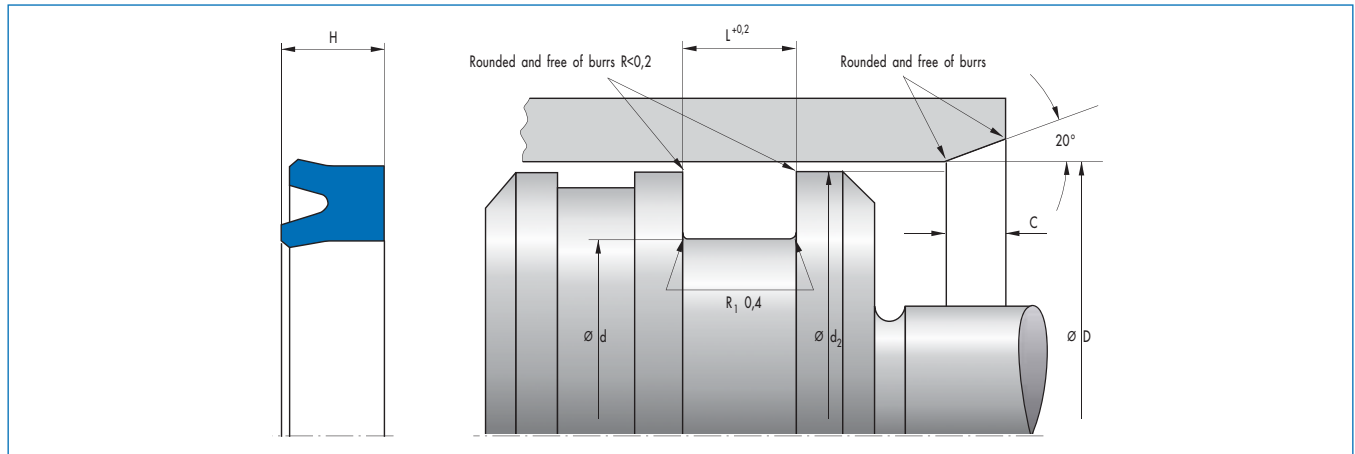
The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

Nominal Ø D	D	d
≤400	H9	h11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

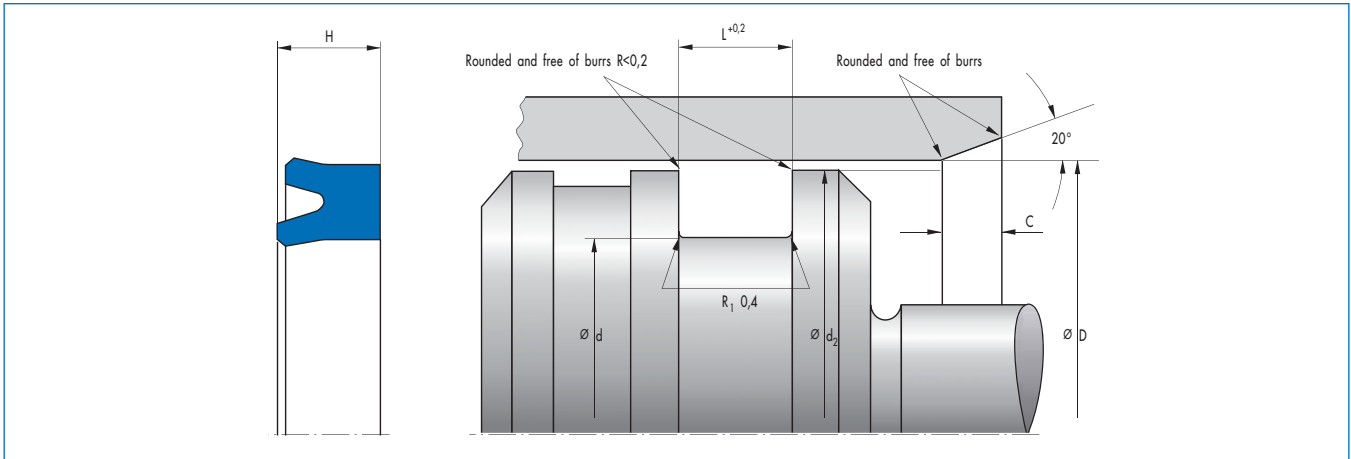
Article list



D	d	H	L	Profile	C	Fitting	Housing	Material	Article No.	
16	6	8	9	5	4			94 AU P00925	21658	●
20	10	8	9	5	4			94 AU P00925	21663	●
22	12	8	9	5	4			94 AU P00925	21668	●
23,5	15	8	9	4,25	4,5			94 AU P00925	322037	○
25	15	8	9	5	4			94 AU P00925	21675	●
30	20	8	9	5	4,5			94 AU P00925	21679	●
32	17	10	11	7,5	5,5			94 AU P00925	21681	●
32	22	10	11	5	4,5			94 AU P00925	21682	●
32	24	5,7	6,7	4	4		ISO	94 AU P00925	401144	●
35	25	7,3	8,3	5	4,5			94 AU P00925	401159	●
38	25	10	11	6,5	5,5			94 AU P00925	401189	○
40	25	10	11	7,5	5,5			94 AU P00925	21691	●
40	30	10	11	5	4,5			94 AU P00925	21692	●
45	30	10	11	7,5	5,5			94 AU P00925	362912	●
48	28	12	13	10	6			94 AU P00925	401210	○
48	35	10	11	6,5	5,5			94 AU P00925	401230	○
50	30	12	13	10	6			94 AU P00925	21701	●
50	35	10	11	7,5	5,5			94 AU P00925	21705	●
50	40	10	11	5	4,5			94 AU P00925	21710	●
55	35	12	13	10	6			94 AU P00925	401253	○
60	40	12	13	10	6			94 AU P00925	21712	●
60	45	10	11	7,5	5,5			94 AU P00925	21713	●
60	50	10	11	5	4,5			94 AU P00925	21718	●
63	43	12	13	10	6			94 AU P00925	21719	○
63	45	12	13	9	6			94 AU P00925	401256	○
63	48	12	13	7,5	5,5		ISO	94 AU P00925	21727	●
63	53	12	13	5	4,5	H		94 AU P00925	21730	●
65	50	10	11	7,5	5,5			94 AU P00925	401260	○
70	50	12	13	10	6			94 AU P00925	21733	●
70	55	12	13	7,5	5,5			94 AU P00925	21735	●
70	60	12	13	5	4,5	H		94 AU P00925	21737	●
75	55	12	13	10	6			94 AU P00925	401254	○
75	60	12	13	7,5	5,5			94 AU P00925	401262	○
80	60	12	13	10	6		ISO	94 AU P00925	21740	●
80	65	12	13	7,5	5,5			94 AU P00925	21763	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing



D	d	H	L	Profile	C	Fitting	Housing	Material	Article No.	
80	70	12	13	5	4,5	H		94 AU P00925	21765	●
85	70	12	13	7,5	5,5			94 AU P00925	81715	○
90	65	12	13	12,5	6,5			94 AU P00925	339345	●
90	70	12	13	10	6			94 AU P00925	400522	●
90	75	12	13	7,5	5,5			94 AU P00925	373006	●
95	80	12	13	7,5	5,5			94 AU P00925	401303	●
100	80	12	13	10	6		ISO	94 AU P00925	21771	●
100	85	12	13	7,5	5,5	H	ISO	94 AU P00925	21775	●
110	90	12	13	10	6			94 AU P00925	363173	○
110	95	12	13	7,5	5,5			94 AU P00925	401317	●
115	90	15	16	12,5	6,5			94 AU P00925	389161	○
115	95	15	16	10	6			94 AU P00925	401318	○
120	100	12	13	10	6			94 AU P00925	367812	●
125	95	18	19	15	7,5			94 AU P00925	21778	○
125	100	15	16	12,5	6,5		ISO	94 AU P00925	401339	●
125	105	15	16	10	6		ISO	94 AU P00925	21784	●
130	110	15	16	10	6			94 AU P00925	314121	○
140	120	12	13	10	6			94 AU P00925	401345	○
140	125	15	16	7,5	5,5			94 AU P00925	401346	○
150	120	18	19	15	7,5			94 AU P00925	21788	○
150	130	15	16	10	6	H		94 AU P00925	21790	●
160	130	18	19	15	7,5			94 AU P00925	21793	○
160	140	15	16	10	6	H	ISO	94 AU P00925	21794	●
170	150	15	16	10	6	H		94 AU P00925	21796	●
180	160	15	16	10	6			94 AU P00925	3980	○
200	180	15	16	10	6	H		94 AU P00925	21811	●
220	190	18	19	15	7,5			94 AU P00925	21816	○
360	320	28	29	20	11			94 AU P00925	21843	○
360	330	20	21	15	7,5			94 AU P00925	21845	○
400	360	28	29	20	11		ISO	94 AU P00925	21846	○
400	370	20	21	15	7,5			94 AU P00925	21847	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring NA 400

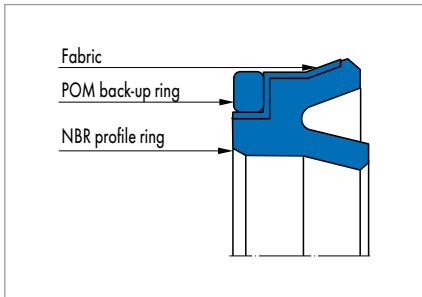


Fig. 1 Merkel U-Ring NA 400

Product description

Merkel U-ring with asymmetrical profile of the sealing lips, fabric reinforcement on the dynamic sealing side and back-up ring as a gap sealing component.

Product advantages

Single-acting piston seal for medium load, preferably for spare parts requirement.

Application

Earth moving equipment, industrial vehicles, presses, mobile hydraulics. We recommend more modern series for new designs.

Material

Sealing component

Material	Code	Hardness
Nitrile rubber NBR	80 NBR 878	80 Shore A

Back-up ring

Material	Code
Polyacetal	POM 992020

Operating conditions

Material	80 NBR 878/POM
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 μm	≤2,5 μm
Groove base	≤1,6 μm	≤6,3 μm
Groove flanks	≤3,0 μm	≤15,0 μm

Percentage contact area M_p >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Profile	Max. permissible gap dimension			
	16 MPa	26 MPa	32 MPa	40 MPa
≤80	0,60	0,50	0,40	0,35
>80	0,65	0,55	0,45	0,40

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

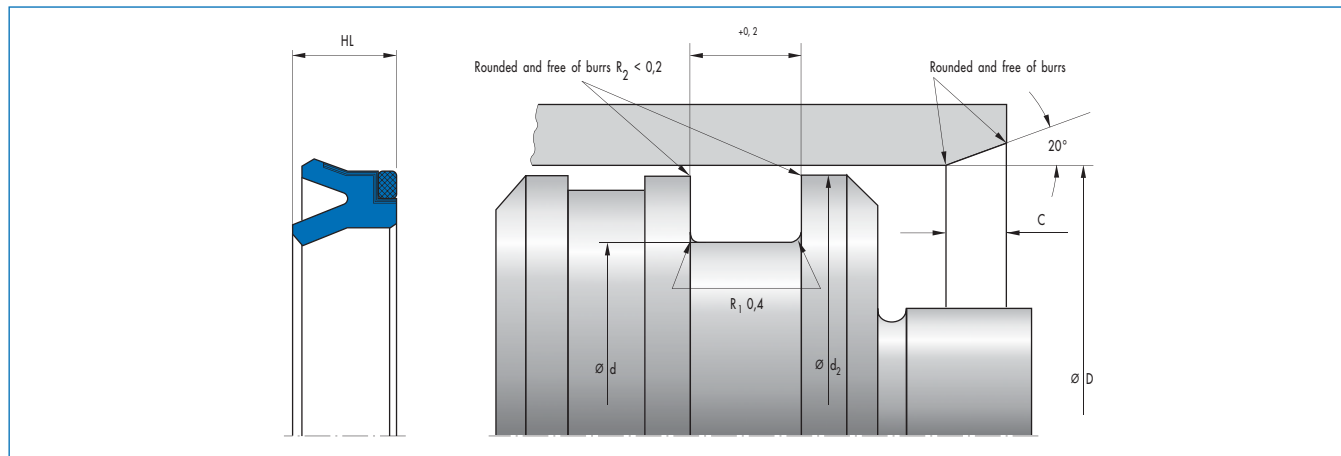
Nominal Ø D	D	d
≤320	H11	h11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

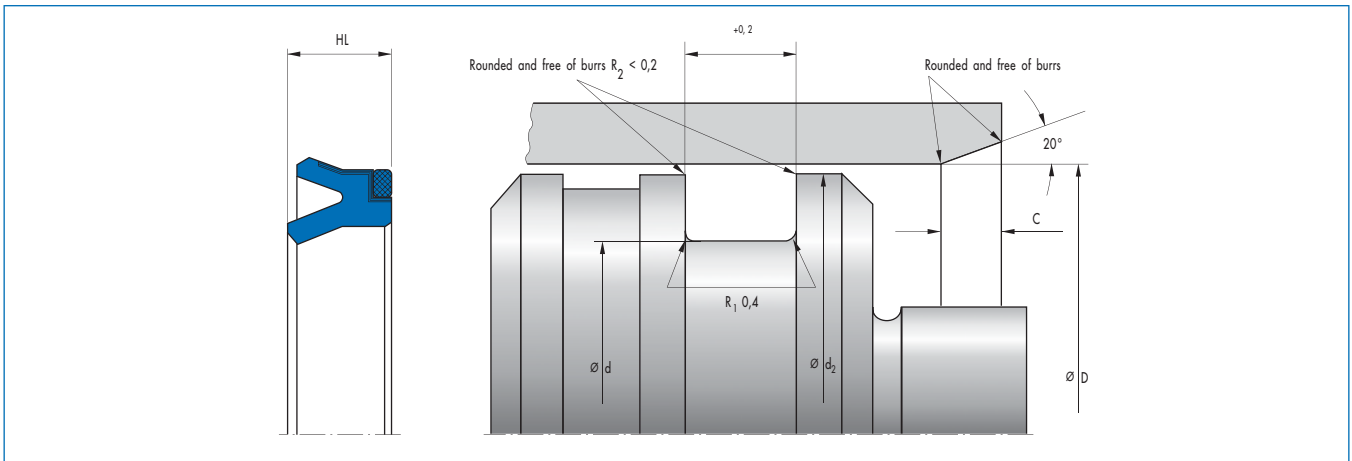
Article list



D	d	H	L	Profile	C	Fitting	Housing	Material	Article No.	
25	15	8	9	5	4			80 NBR M00878	25279	○
32	17	10	11	7,5	5,5			80 NBR M00878	25287	○
40	25	10	11	7,5	5,5			80 NBR M00878	25289	○
45	30	10	11	7,5	5,5			80 NBR M00878	4561	●
50	30	12	13	10	6			80 NBR M00878	25325	●
50	35	10	11	7,5	5,5			80 NBR M00878	25306	●
55	40	10	11	7,5	5,5			80 NBR M00878	4565	●
60	40	12	13	10	6			80 NBR M00878	30008	○
63	43	12	13	10	6			80 NBR M00878	25351	○
63	48	10	11	7,5	5,5			80 NBR M00878	25330	●
70	50	12	13	10	6			80 NBR M00878	4566	●
75	55	12	13	10	6			80 NBR M00878	30009	●
80	55	15	16	12,5	6,5			80 NBR M00878	25404	○
80	60	12	13	10	6		ISO	80 NBR M00878	25383	●
80	65	10	11	7,5	5,5	W		80 NBR M00878	25354	●
90	70	12	13	10	6	W		80 NBR M00878	30011	○
100	75	15	16	12,5	6,5			80 NBR M00878	25427	○
100	80	12	13	10	6	W	ISO	80 NBR M00878	25415	●
110	90	12	13	10	6	W		80 NBR M00878	30021	●
115	90	15	16	12,5	6,5			80 NBR M00878	35943	○
120	100	12	13	10	6	W		80 NBR M00878	30026	○
125	100	15	16	12,5	6,5		ISO	80 NBR M00878	25452	●
125	105	12	13	10	6	W	ISO	80 NBR M00878	25440	●
140	120	12	13	10	6			80 NBR M00878	30030	●
150	125	15	16	12,5	6,5			80 NBR M00878	30033	○
160	130	18	19	15	7,5			80 NBR M00878	25474	○
160	135	15	16	12,5	6,5	W	ISO	80 NBR M00878	25464	●
180	150	18	19	15	7,5			80 NBR M00878	3631	●
200	170	18	19	15	7,5		ISO	80 NBR M00878	25493	○
200	175	15	16	12,5	6,5	W	ISO	80 NBR M00878	25491	●
220	190	18	19	15	7,5			80 NBR M00878	25495	○
220	195	15	16	12,5	6,5	W		80 NBR M00878	4580	○
250	215	20	21	17,5	10			80 NBR M00878	25503	○
250	220	18	19	15	7,5	W	ISO	80 NBR M00878	25496	●
280	250	18	19	15	7,5	W		80 NBR M00878	4610	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing



D	d	H	L	Profile	C	Fitting	Housing	Material	Article No.	
320	280	23	24	20	11			80 NBR M00878	4624	○
320	285	20	21	17,5	10	W		80 NBR M00878	4618	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring T 18

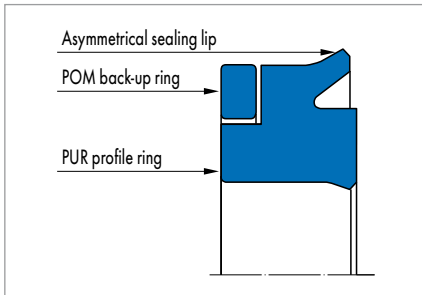


Fig. 1 Merkel U-Ring T 18

Product description

Merkel U-ring with integrated back-up ring, asymmetrical profile with pressure-relieving grooves, outer lip set back and press fit at the inside diameter.

Product advantages

Single-acting piston seal also for standardised housings according to ISO 5597

- Very good static and dynamic tightness
- High extrusion resistance (back-up ring)
- “back-to-back” arrangement for pistons with pressure on both sides
- High reliability
- Relief grooves against dynamic drag pressure.

Application

Heavy duty earth moving equipment, scrap shears.

Material

Profile ring

Material	Code	Hardness
Polyurethane	95 AU V142	95 Shore A

Back-up ring

Material	Code
Polyacetal	POM PO202

Other materials are available on request.

Operating conditions

Material	95 AU V142/POM PO202
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension d2

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual. Regard must be paid to the dimensions d1 and df in relation with the guide element used.

Profile	Max. permissible gap dimension			
	16 MPa	26 MPa	32 MPa	40 MPa
7,5	0,80	0,70	0,50	0,40
>7,5	1,05	0,90	0,85	0,80

Tolerance recommendation and dimension d2

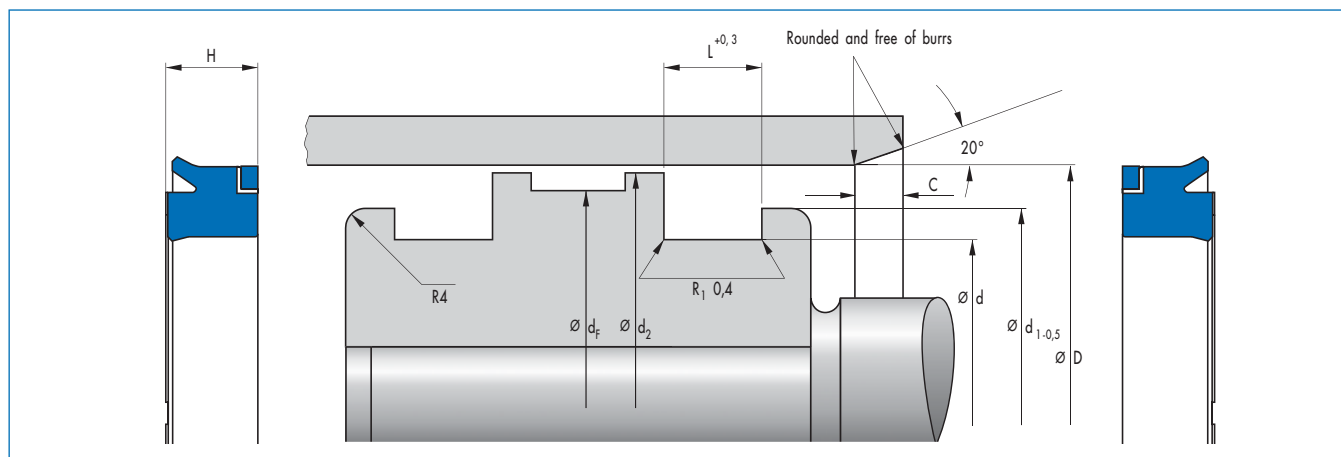
The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

Nominal Ø D	<40 MPa	
	D	d
≤400	H8	h11

Fitting & installation

We recommend the use of a fitting tool for the fitting. Careful fitting is a prerequisite for the correct function of the seal. → Technical Manual.

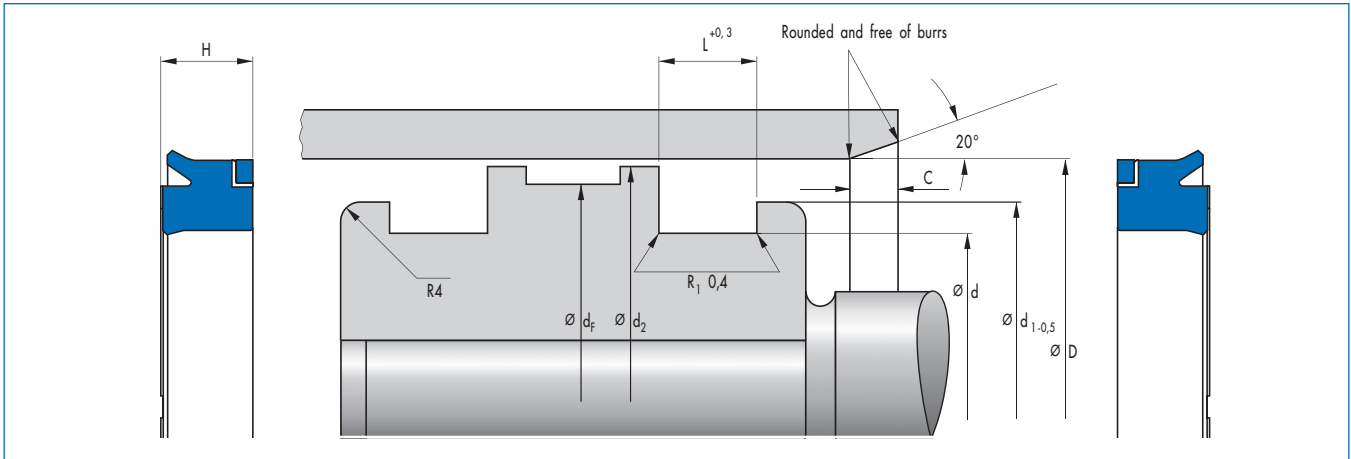
Article list



D	d	d ₁	H	L	Profile	C	Fitting	Housing	Material	Article No.	
40	25	35	9,3	9,5	7,5	4	W		95 AU V142	24245851	●
40	25	35	9,3	10	7,5	4	W		95 AU V142	24245876	●
45	30	40	9,3	9,5	7,5	4	W		95 AU V142	24245852	●
45	30	40	9,3	10	7,5	4	W		95 AU V142	24245877	●
50	35	45	9,3	9,5	7,5	4	W	ISO	95 AU V142	24245853	●
50	35	45	9,3	10	7,5	4	W		95 AU V142	24245878	●
55	40	50	9,3	9,5	7,5	4	W		95 AU V142	24245854	●
55	40	50	9,3	10	7,5	4	W		95 AU V142	24245879	●
60	45	55	9,3	9,5	7,5	4	W		95 AU V142	24245855	●
60	45	55	9,3	10	7,5	4	W		95 AU V142	24245880	●
63	48	58	9,3	9,5	7,5	4	W	ISO	95 AU V142	24245856	●
63	48	58	9,3	10	7,5	4	W		95 AU V142	24245881	●
65	50	60	9,3	9,5	7,5	4	W		95 AU V142	24245857	●
65	50	60	9,3	10	7,5	4	W		95 AU V142	24245882	●
70	50	64	12,2	12,5	10	5	W		95 AU V142	24245858	●
70	50	64	12,2	13	10	5	W		95 AU V142	24245883	●
70	55	64	9,3	9,5	7,5	4	H		95 AU V142	24298857	●
75	55	69	12,2	12,5	10	5	W		95 AU V142	24338114	●
80	60	74	12,2	12,5	10	5	W	ISO	95 AU V142	24245859	●
80	60	74	12,2	13	10	5	W		95 AU V142	24245884	●
80	65	75	9,3	9,5	7,5	4	H	ISO	95 AU V142	24290783	●
85	70	80	9,3	9,5	7,5	4	H		95 AU V142	24315436	●
90	70	84	12,2	12,5	10	5	W		95 AU V142	24245860	●
90	70	84	12,2	13	10	5	W		95 AU V142	24245885	●
90	75	85	9,3	9,5	7,5	4	H		95 AU V142	24298858	●
100	80	94	12,2	12,5	10	5	W	ISO	95 AU V142	24245861	●
100	80	94	12,2	13	10	5	W		95 AU V142	24245886	●
100	85	95	9,3	9,5	7,5	4	H	ISO	95 AU V142	24269439	●
105	85	99	12,2	13	10	5	W		95 AU V142	24345515	●
110	90	104	12,2	12,5	10	5	W		95 AU V142	24245862	●
110	90	104	12,2	13	10	5	W		95 AU V142	24245887	●
114	94	108	12,2	13	10	5	W		95 AU V142	24298411	○
115	95	109	12,2	12,5	10	5	W		95 AU V142	24245863	●
115	95	109	12,2	13	10	5	W		95 AU V142	24245888	●
125	100	117	15,2	15,5	12,5	6,5	W		95 AU V142	24245864	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing



D	d	d ₁	H	L	Profile	C	Fitting	Housing	Material	Article No.	
125	100	117	15,2	16,2	12,5	6,5	W		95 AU V142	24245865	●
125	100	117	15,2	16	12,5	6,5	W	ISO	95 AU V142	24245889	●
125	105	119	12,2	12,5	10	5	H	ISO	95 AU V142	24288858	●
130	110	124	12,2	12,5	10	5	W		95 AU V142	24269441	●
140	115	132	15,2	16,2	12,5	6,5	W		95 AU V142	24245866	●
140	115	132	15,2	15,5	12,5	6,5	W		95 AU V142	24245890	●
140	120	134	12,2	12,5	10	5	H		95 AU V142	24275200	●
150	120	140	18,6	19,8	15	7,5	W		95 AU V142	24245867	●
150	120	140	18,6	19	15	7,5	W		95 AU V142	24245891	●
150	130	144	12,2	12,5	10	5	H		95 AU V142	24265868	●
160	130	150	18,6	19,8	15	7,5	W		95 AU V142	24245868	●
160	130	150	18,6	19	15	7,5	W		95 AU V142	24245892	●
160	140	154	12,2	12,5	10	5	H	ISO	95 AU V142	24269443	●
170	150	164	12,2	12,5	10	5	H		95 AU V142	24274946	●
180	150	170	18,6	19,8	15	7,5	W		95 AU V142	24245869	●
180	150	170	18,6	19	15	7,5	W		95 AU V142	24245893	●
180	160	174	12,2	12,5	10	5	H		95 AU V142	24287370	●
200	170	190	18,6	19,8	15	7,5	W		95 AU V142	24245870	●
200	170	190	18,6	19	15	7,5	W		95 AU V142	24245894	●
200	170	190	18,6	20	15	7,5	W	ISO	95 AU V142	24245895	●
200	175	192	15,7	16	12,5	6,5	H	ISO	95 AU V142	24287379	●
220	200	214	15,7	16	10	6,5	H		95 AU V142	24337777	●
225	195	215	18,6	19	15	7,5	W		95 AU V142	24245871	●
225	195	215	18,6	19,8	15	7,5	W		95 AU V142	24245896	●
250	220	240	18,6	19	15	7,5	W		95 AU V142	24245872	●
250	220	240	18,6	20	15	7,5	W	ISO	95 AU V142	24245873	●
250	220	240	18,6	19,8	15	7,5	W		95 AU V142	24245897	●
250	225	242	15,7	16	12,5	6,5	H	ISO	95 AU V142	24289374	●
280	250	270	18,6	19,8	15	7,5	W		95 AU V142	24245874	●
280	250	270	18,6	19	15	7,5	W		95 AU V142	24245898	●
300	270	290	18,6	19,8	15	7,5	W		95 AU V142	24245875	●
300	270	290	18,6	19	15	7,5	W		95 AU V142	24245899	●
320	290	310	18,6	20	15	7,5	W	ISO	95 AU V142	24245900	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Fitting: H = by hand; W = with fitting tool; blank = axially accessible housing

Merkel U-Ring TM 21

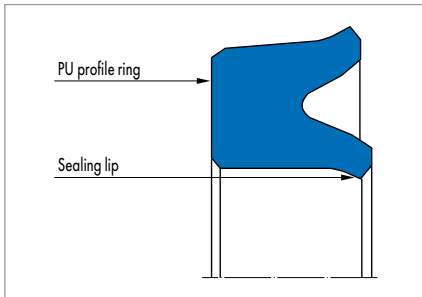


Fig. 1 Merkel U-Ring TM 21

Product description

Merkel U-ring with asymmetrical profile, inner lip set back and press fit at the outer diameter.

Product advantages

Single-acting piston seal for hydraulic cylinders used in heavy machinery areas. The highly wear-resistant polyurethane material allows for use under high operating requirements

- Good media resistance
- Broad range of temperatures
- Very good static and dynamic tightness
- No mould tools required
- Large range of dimensions.

Application

Injection moulding machines, presses, heavy machinery manufacture, large cylinders.

Material

Ø range <500

Material	Code	Hardness
Polyurethane	95 AU V142	95 Shore A

Ø range >500

Material	Code	Hardness
Polyurethane	93 AU V167	93 Shore A

Operating conditions

Material	95 AU V142	93 AU V167
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +110	-25 ... +100
HFA fluids	+5 ... +50	+5 ... +60
HFB fluids	+5 ... +50	+5 ... +60
HFC fluids	-30 ... +40	-25 ... +40
HFD fluids	-	-
Water	+5 ... +50	+5 ... +60
HETG (rapeseed oil)	-30 ... +60	-25 ... +60
HEES (synthetic esters)	-30 ... +80	-25 ... +80
HEPG (glycol)	-30 ... +50	-25 ... +50
Mineral greases	-30 ... +110	-25 ... +100
Pressure p in MPa	40	
Running speed v in m/s	0,5	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2. → Technical Manual.

Housing recommendations for new designs

Primary seal TM 20

D	d	L	c
>200 ... 630	D-30	25	9
>630 ... 800	D-40	32	11
>800 ... 2000	D-50	40	13

Recommended tolerances* for Merkel Guide Ring KB

D	16 MPa				26 MPa				
	Ø D	S	D	d	X2	S	D	d	X2
... 250	15	H8	h11	0,65	15	H8	h11	0,55	
... 500	15	H8	h11	0,65	15	H8	h11	0,55	
... 560	15	H8	h11	0,65	15	H8	h11	0,55	
... 450	20	H8	h11	0,67	20	H8	h11	0,57	
... 600	20	H8	h11	0,67	20	H8	h11	0,57	
... 750	20	H8	h11	0,67	20	H8	h11	0,57	
... 1000	25	H8	h11	0,70	25	H8	h11	0,60	
... 1400	25	H7	h11	0,70	25	H7	h11	0,60	

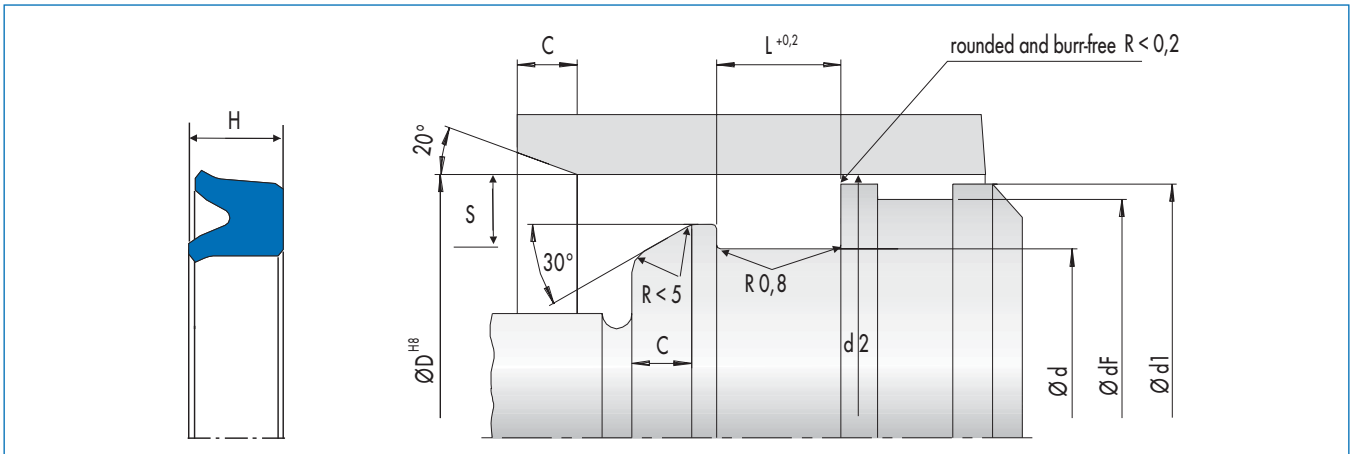
D	32 MPa				40 MPa				
	Ø D	S	D	d	X2	S	D	d	X2
... 250	15	H8	h11	0,45	15	H8	h11	0,40	
... 500	15	H8	h11	0,45	15	H7	h11	0,40	
... 560	15	H7	h11	0,45	15	H7	h11	0,40	
... 450	20	H8	h11	0,47	20	H8	h11	0,42	
... 600	20	H7	h11	0,47	20	H7	h11	0,42	
... 750	20	H7	h11	0,47	20	H7	h11	0,42	
... 1000	25	H7	h11	0,47	25	H7	h11	0,42	
... 1400	25	H7	h11	0,47	25	H7	h11	0,42	

* Profiles in accordance with "Housing recommendations for new designs".

Fitting & installation

An axially accessible housing is necessary for articles with the "M" marking.
For different housings, e. g. in old plants, please consult our advisory service.

Article list



D	d	H	L	Profile	C	Material	Article No.	
160	130	17,2	19	15	9	95 AU V142	24370477	○
180	150	17,2	19	15	9	95 AU V142	24370478	○
210	180	20,9	23	15	9	95 AU V142	24370479	○
220	190	20,9	23	15	9	95 AU V142	24368168	○
230	200	20,9	23	15	9	95 AU V142	24368169	○
240	210	20,9	23	15	9	95 AU V142	24368170	○
250	220	20,9	23	15	9	95 AU V142	24368171	○
280	250	20,9	23	15	9	95 AU V142	24367971	○
300	270	20,9	23	15	9	95 AU V142	24368173	○
310	280	20,9	23	15	9	95 AU V142	24368174	○
320	280	29,1	32	20	11	95 AU V142	24373867	○
330	300	20,9	23	15	9	95 AU V142	24368175	○
340	310	20,9	23	15	9	95 AU V142	529099	○
350	320	20,9	23	15	9	95 AU V142	24370480	○
360	320	29,1	32	20	11	95 AU V142	24368208	○
360	330	23,7	26	15	9	95 AU V142	24370481	○
380	350	23,7	26	15	9	95 AU V142	24363187	○
400	360	29,1	32	20	11	95 AU V142	24368177	○
400	370	23,7	26	15	9	95 AU V142	24362505	○
420	390	23,7	26	15	9	95 AU V142	24368178	○
430	400	23,7	26	15	9	95 AU V142	24368179	○
450	420	23,7	26	15	9	95 AU V142	24368180	○
460	420	29,1	32	20	11	95 AU V142	24371311	○
470	440	23,7	26	15	9	95 AU V142	24368182	○
480	450	23,7	26	15	9	95 AU V142	24368183	○
500	470	23,7	26	15	9	95 AU V142	24368184	○
560	530	23,7	26	15	9	93 AU V168	24370483	○
600	560	23,7	26	20	11	93 AU V168	24368186	○
680	640	29,1	32	20	11	93 AU V168	24368188	○
710	670	23,7	26	20	11	93 AU V168	24377403	○
800	750	30,5	33,5	25	13	93 AU V168	24372489	○
950	900	30,9	34	25	13	93 AU V168	24368191	○
1160	1110	31,9	35	25	13	93 AU V168	24359833	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel U-Ring TMP 21

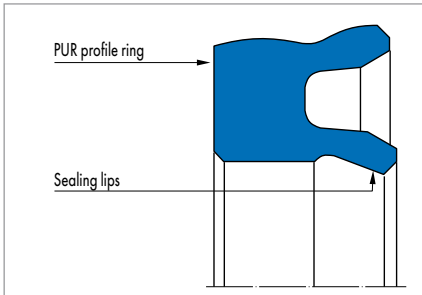


Fig. 1 Merkel U-Ring TMP 21

Product description

Single-acting Merkel U-Ring TMP 21 made from polyurethane.

Product advantages

Piston seal that is primarily used in pneumatic cylinders in heavy-duty mechanical engineering. The U-rings are designed for application of pressure on one side.

- High tightness
- Large range of dimensions
- Suitable for dry air
- No mould tools required.

Application

Presses, large cylinders.

Material

D <500

Material	Code	Hardness	Colour
Polyurethane	93 AU V167	93 Shore A	red

D >500

Material	Code	Hardness	Colour
Polyurethane	93 AU V168	93 Shore A	red

Operating conditions

Material	93 AU V167/93 AU V168
Temperature range in °C	
Pneumatic	Air, dried or oiled
Pressure p in MPa	2*
Running speed v in m/s	1,5

* short version <1,2 MPa

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_c >50% to max 90% at cutting depth c = RZ/2 and reference line C ref = 0%. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

Design notes

Please observe our general design notes in → Technical Manual.

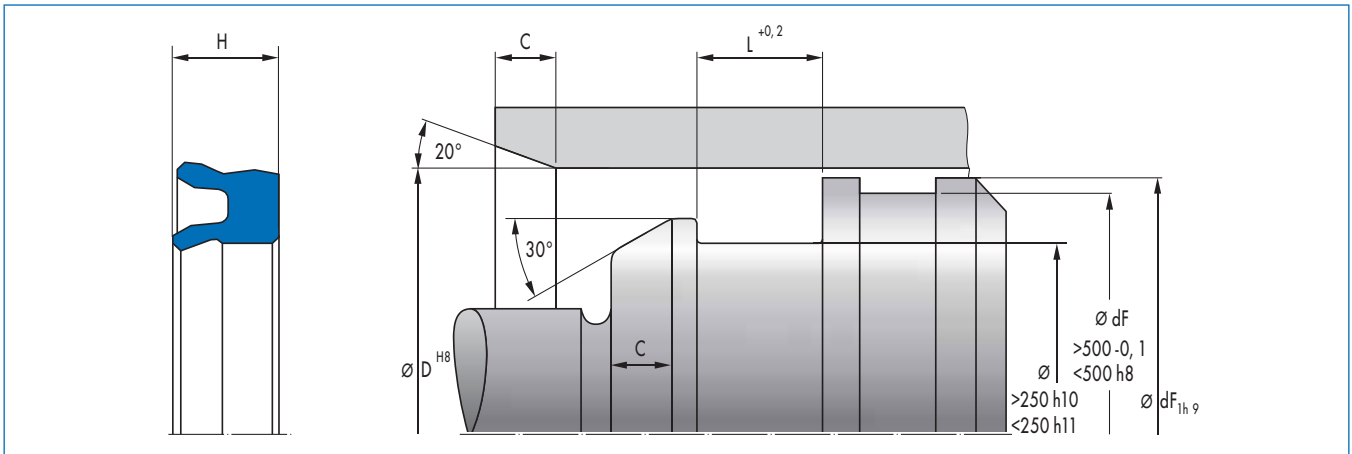
Housing recommendations for new designs

D	d	L	C
>70 ... 200	D - 20	16	8,5
>125 ... 345	D - 25	20	10,0
>180 ... 660	D - 30	24	11,5
>440 ... 840	D - 40	32	12,5
>850 ... 1250	D - 50	40	16,0
>1060 ... 2000	D - 60	48	18,0

Fitting & installation

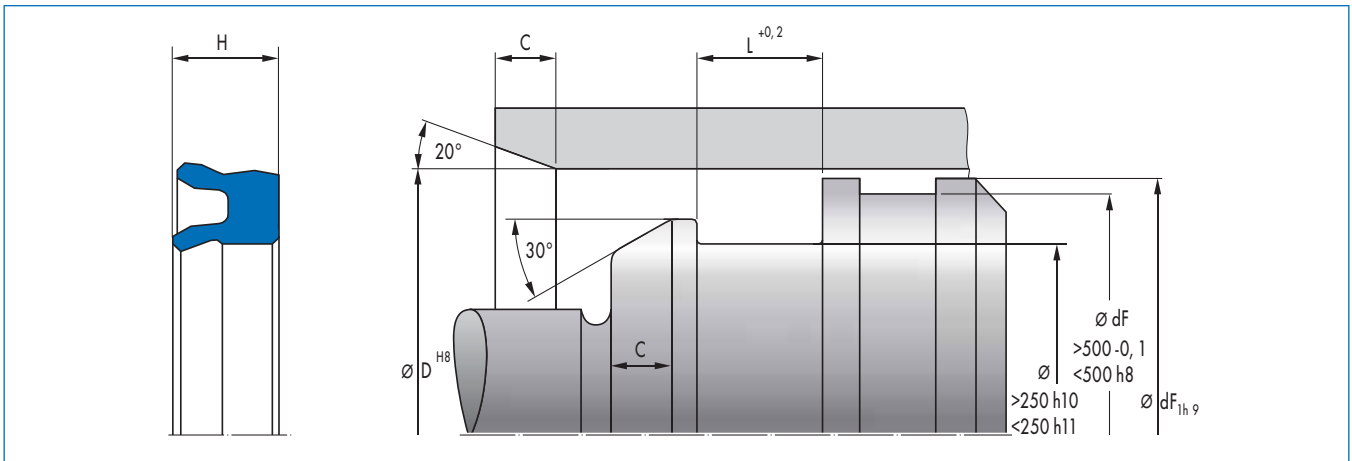
The piston seals can be pulled over the metallic face support shoulder by hand or by using an assessment aid (Gi-Hammer, lightly oiling or greasing seal). For different housings, e.g. in old plants, please consult our advisory service. For an optimum running-in and operation behaviour, the U-Rings should be lightly oiled or greased (initial lubrication) prior to use.

Article list



D	d	H	L	Profile	C	Material	Article No.	
200	170	20,9	23	15	11,5	93 AU V167	24370320	○
220	190	20,9	23	15	11,5	93 AU V167	24368204	○
230	200	20,9	23	15	11,5	93 AU V167	24368205	○
240	210	20,9	23	15	11,5	93 AU V167	24368206	○
250	220	20,9	23	15	11,5	93 AU V167	24368207	○
270	240	20,9	23	15	11,5	93 AU V167	24368317	○
280	250	20,9	23	15	11,5	93 AU V167	24368209	○
300	270	20,9	23	15	11,5	93 AU V167	24372471	○
310	280	20,9	23	15	11,5	93 AU V167	24368210	○
350	320	20,9	23	15	11,5	93 AU V167	24368212	○
360	330	20,9	23	15	11,5	93 AU V167	24377184	○
380	350	23,7	26	15	11,5	93 AU V167	24368213	○
420	390	23,7	26	15	11,5	93 AU V167	24372719	○
430	400	23,7	26	15	11,5	93 AU V167	24368215	○
450	420	23,7	26	15	11,5	93 AU V167	24368216	○
480	450	23,7	26	15	11,5	93 AU V167	24370400	○
500	470	23,7	26	15	11,5	93 AU V167	24368217	○
530	500	23,7	26	15	11,5	93 AU V167	24368219	○
550	520	23,7	26	15	11,5	93 AU V168	24380029	○
560	530	23,7	26	15	11,5	93 AU V168	24368220	○
600	560	24,9	26,5	20	12,5	93 AU V168	24368221	○
610	570	24,9	26,5	20	12,5	93 AU V168	49001223	○
630	600	23,7	26	15	11,5	93 AU V168	24367303	○
660	620	24,9	26,5	20	12,5	93 AU V168	49001224	○
670	630	24,9	26,5	20	12,5	93 AU V168	24376128	○
700	660	24,9	26,5	20	12,5	93 AU V168	49001225	○
710	670	24,9	26,5	20	12,5	93 AU V168	24368222	○
750	710	24,9	26,5	20	12,5	93 AU V168	24368223	○
800	750	32	34	25	16	93 AU V168	24368224	○
820	780	30,9	34	20	16	93 AU V168	49001226	○
840	790	32	34	25	12,5	93 AU V168	49005726	○
850	800	32	34	25	16	93 AU V168	24368225	○
900	850	32	34	25	16	93 AU V168	24368226	○
950	900	32	34	25	16	93 AU V168	24368227	○
1000	950	32	34	25	16	93 AU V168	24368228	○

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d	H	L	Profile	C	Material	Article No.	
1060	1000	40	42,5	30	18	93 AU V168	24368050	○
1120	1060	40	42,5	30	18	93 AU V168	24368229	○
1180	1120	40	42,5	30	18	93 AU V168	24367969	○
1240	1180	40	42,5	30	18	93 AU V168	24367640	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal T 42

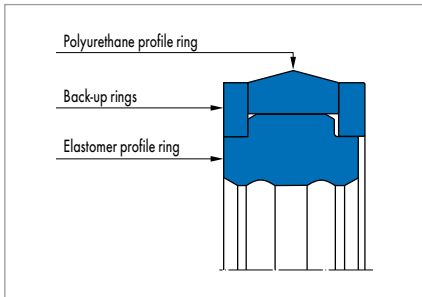


Fig. 1 Merkel Compact Seal T 42

Product description

Double-acting Merkel Compact Seal T 42 with back-up rings.

Product advantages

Merkel Compact Seal T 42 for sealing pistons which can be pressurised on both sides in plungers, pushers and subsidiary cylinders in self-advancing support systems

- Very good protection against extrusion even with pressure peaks
- High resistance to abrasion
- High contact pressure due to rubber profile ring.

Application

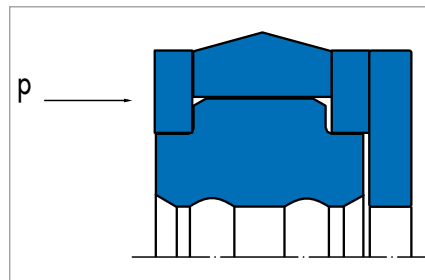
Mining.

Material

Polyurethane profile ring	Back-up rings	Elastomer profile ring
93 AU V167	POM PO202	85 NBR B203 80 NBR B246

Operating conditions

Material	93 AU V167/NBR/POM PO202
Temperature range in °C	
HFA fluids	+5 ... +60
HFD fluids	+5 ... +60
Pressure p in MPa *	50
Running speed v in m/s	0,1



* If a full-surface back-up ring is used on the side not subjected to high pressure, the use of up to 150 MPa is possible. The height of the backup-ring should be 5 mm.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Ø d		16 MPa					26 MPa				
	Profile	D	d	D2	DF	X2	D	d	D2	DF	X2
... 230	>7,5 ... 10,0 (BR 5,0)	H8	h9	h9	h8	1,1	H8	h9	h9	h8	0,8
... 300	>10,0 ... 12,5 (BR 6,0)	H8	h9	h9	h8	1,6	H8	h9	h9	h8	1,2
... 380	>12,5 (BR 7,5 x 5,0)	H8	h9	h9	h8	1,6	H8	h9	h9	h8	1,2
... 140	≤7,5 (BR 4,0 x 3,0)	H8	h9	h9	h8	0,8	H8	h9	h9	h8	0,6
... 160	>7,5 ... 8,5 (BR 4,5)	H8	h9	h9	h8	0,8	H8	h9	h9	h8	0,6

Ø d		32 MPa					40 MPa				
	Profile	D	d	D2	DF	X2	D	d	D2	DF	X2
... 230	>7,5 ... 10,0 (BR 5,0)	H8	h9	h9	h8	0,6	H8	h9	h9	h8	0,5
... 300	>10,0 ... 12,5 (BR 6,0)	H8	h9	h9	h8	0,9	H8	h9	h9	h8	0,7
... 380	>12,5 (BR 7,5 x 5,0)	H8	h9	h9	h8	0,9	H8	h9	h9	h8	0,7
... 140	≤7,5 (BR 4,0 x 3,0)	H8	h9	h9	h8	0,5	H8	h9	h9	h8	0,4
... 160	>7,5 ... 8,5 (BR 4,5)	H8	h9	h9	h8	0,5	H8	h9	h9	h8	0,4

Gap dimension X2

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Tolerance recommendation and dimension d2

When designing d₂ the admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account → Technical Manual.

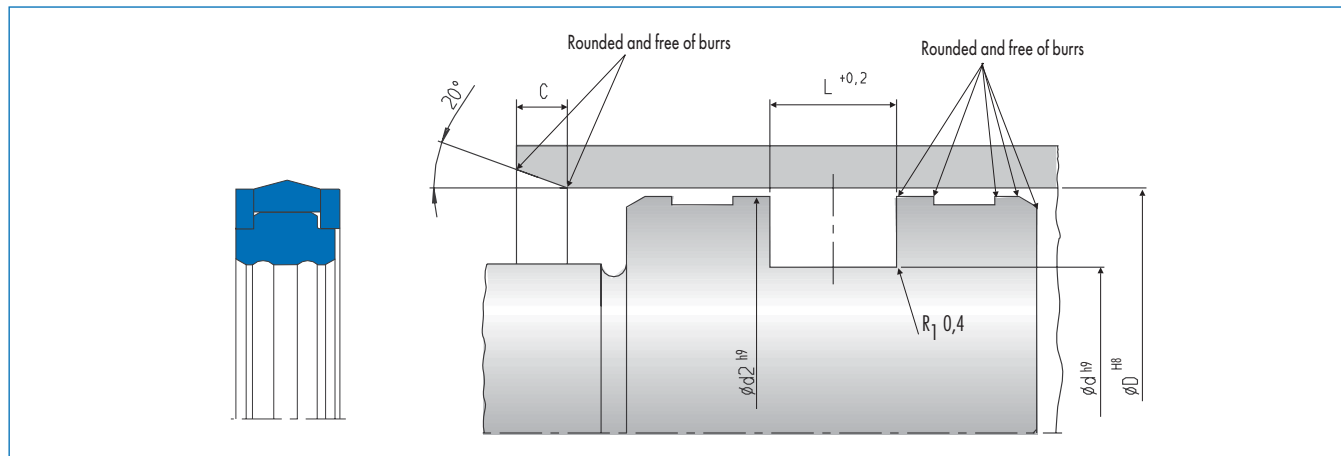
Profile recommendation

D	S	L
<150	7,5	16,0
150 ... 200	10,0	20,0
>200 ... 400	12,5	20,0
>400	15,0	25,0

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal. → Technical Manual.

Article list



D	d	H	L	Profile	C	Material	Article No.	
60	44	19	20,5	8	4	93 AU V167	24367984	○
105	91	15,2	16,5	7	4	93 AU V167	24367987	○
110	95	14,7	16	7,5	4	93 AU V167	24367988	○
115	97	21	22,5	9	5	93 AU V167	24367989	○
115	100	14,7	16	7,5	4	93 AU V167	24367990	○
120	105	14,7	16	7,5	4	93 AU V167	24367991	○
125	110	14,7	16	7,5	4	93 AU V167	24346872	○
125	110	14,7	16	7,5	4	93 AU V167	24367993	○
130	115	14,7	16	7,5	4	93 AU V167	24373713	○
135	120	14,7	16	7,5	4	93 AU V167	24367994	○
140	125	14,7	16	7,5	4	93 AU V167	24374443	○
150	133	18,5	20	8,5	5	93 AU V167	24373891	○
160	143	18,5	20	8,5	5	93 AU V167	24367996	○
165	145	18,5	20	10	5	93 AU V167	24361344	○
170	150	18,5	20	10	5	93 AU V167	24367998	○
175	155	18,5	20	10	5	93 AU V167	24366948	○
185	165	14,2	15,5	10	5	93 AU V167	24375902	○
185	165	18,5	20	10	5	93 AU V167	24361930	○
210	190	18,5	20	10	5	93 AU V167	24368002	○
245	220	22,5	24	12,5	6	93 AU V167	24368006	○
250	225	23,5	25	12,5	6	93 AU V167	24368007	○
260	235	23,9	25,4	12,5	6	93 AU V167	24373958	○
270	245	22,5	24	12,5	6	93 AU V167	24373583	○
320	290	28,5	30	15	7	93 AU V167	24368009	○
345	315	28,5	30	15	7	93 AU V167	24373956	○
360	330	29,5	31,5	15	7	93 AU V167	24373582	○
380	350	30	32	15	7	93 AU V167	24375290	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal T 44

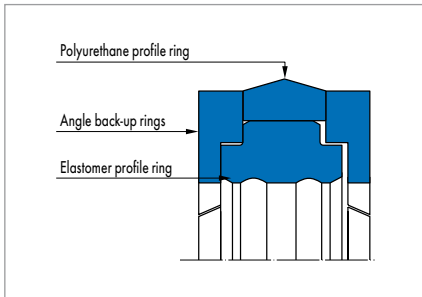


Fig. 1 Merkel Compact Seal T 44

Product description

Double-acting Merkel Compact Seal T 44 with semi-active angle back-up rings.

Product advantages

Merkel Compact Seal T 44 for sealing pistons which can be pressurised on both sides in plungers, pushers and subsidiary cylinders in self-advancing support systems

- Very good protection against extrusion even with pressure peaks
- High resistance to abrasion
- High contact pressure due to rubber profile ring.

Application

Mining.

Material

Polyurethane profile ring	Back-up rings	Elastomer profile ring
93 AU V167	Polyacetal POM PO202	85 NBR B203

Operating conditions

Material	93 AU V167/NBR/POM PO202
	Temperature range in °C
HFA fluids	+5 ... +60
HFD fluids	+5 ... +60
Pressure p in MPa *	150
Running speed v in m/s	0,1

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension X2

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2.

Ø d	Profile	16 MPa			26 MPa			32 MPa			40 MPa		
		D	d	X2	D	d	X2	D	d	X2	D	d	X2
... 225	≤11.0 (BR 5,0 x 3,0)	H8	h9	1,1	H8	h9	0,8	H8	h9	0,6	H8	h9	0,5
... 350	>11.0 (BR 7,5 x 5,0)	H8	h9	1,6	H8	h9	1,2	H8	h9	0,9	H8	h9	0,7

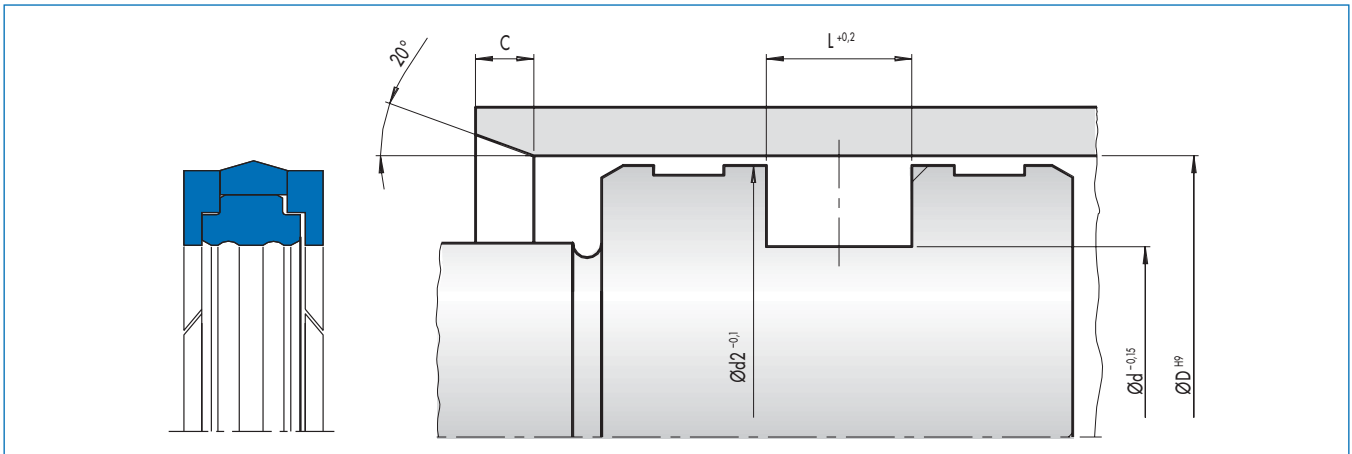
Profile recommendation

D	S	L
≤200	10,0	25
>200 ... 400	12,5	25
>400	15,0	30

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal
→ Technical Manual.

Article list



D	d	H	L	Profile	C	Material	Article No.	
110	85	28,5	28,5	12,5	6	93 AU V167	24368011	○
125	100	23,5	23,5	12,5	6	93 AU V167	24368012	○
140	115	24	24	12,5	6	93 AU V167	24368015	○
140	123	22,7	22,7	8,5	5	93 AU V167	24368016	○
150	130	28,5	28,5	10	5	93 AU V167	24368017	○
155	125	28,5	28,5	15	7,5	93 AU V167	24368018	○
160	138	28,5	28,5	11	6	93 AU V167	24362541	○
160	140	28,5	28,5	10	5	93 AU V167	24351260	○
200	175	24	24	12,5	6	93 AU V167	24368023	○
200	175	28,5	28,5	12,5	6	93 AU V167	24368024	○
216	196	28,5	28,5	10	5	93 AU V167	24356551	○
220	190	28,5	24,5	15	7,5	93 AU V167	24368027	○
235	210	23,5	23,5	12,5	6	93 AU V167	24351264	○
345	315	28	28,5	15	7,5	93 AU V167	24359635	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel U-Ring Seal Set 0215

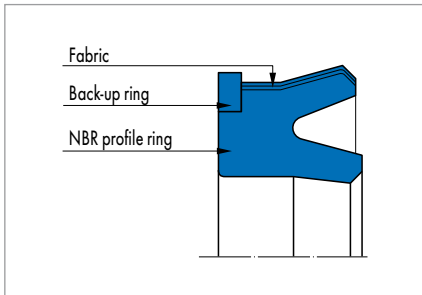


Fig. 1 Merkel U-Ring Seal Set 0215

Product description

Two-piece Merkel seal set comprising an elastomer U-ring with a fabric reinforcement on the contact area up to over the sealing edge and an active back-up ring.

Product advantages

Single-acting piston seal for use in hydraulics or pneumatics

- Low friction due to fabric reinforcement
- Large range of dimensions
- Activated back-up ring prevents extrusion.

Application

Injection moulding machines, iron and steel technology, presses, marine hydraulics, steel hydraulics engineering, scrap cutters, pneumatic cylinders.

Material

U-Ring

Material	Code
NBR U-ring	80 NBR B246
Cotton fabric	BI-NBR B4 B248

Back-up ring

	Material	Code
D <300 mm	Polyacetal POM	POM PO202
D >300 mm	Polyamide	PA 6.G200

Other materials like PTFE bronze back-up ring on enquiry.

Operating conditions

Material	80 NBR B246/BI-NBR B4B248/POM PO202	80 NBR B246/BI-NBR B4 B248/PA 6.G200
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +100
HFA fluids	+5 ... +60	+5 ... +60
HFB fluids	+5 ... +60	+5 ... +60
HFC fluids	-30 ... +60	-30 ... +60
HFD fluids	-	-
Water	+5 ... +100	+5 ... +100
HETG (rapeseed oil)	-30 ... +80	-30 ... +80
HEES (synthetic esters)	-30 ... +80	-30 ... +80
HEPG (glycol)	-30 ... +60	-30 ... +60
Mineral greases	-30 ... +100	-30 ... +100
Pressure p in MPa Hydraulic	25 or 40*	
Pressure p in MPa Pneumatic	5	
Running speed v in m/s	1,5	

* max. pressure depends on the profile.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Back-up ring height h	16 MPa			26 MPa			32 MPa			40 MPa		
	D	d	X2	D	d	X2	D	d	X2	D	d	X2
1,5	H8	h10	0,50	H8	h10	0,50	H8	h10	0,40	H8	h10	0,30
2,5	H8	h10	0,80	H8	h10	0,70	H8	h10	0,60	H8	h10	0,40
3,0	H8	h10	0,80	H8	h10	0,70	H8	h10	0,60	H8	h10	0,40
3,5	H8	h10	1,20	H8	h10	1,00	H8	h10	0,65	H8	h10	0,50
4,0	H8	h10	1,20	H8	h10	1,00	H8	h10	0,65	H8	h10	0,50
5,0	H8	h10	1,80	H8	h10	1,40	H8	h10	0,90	H8	h10	0,70
6,0	H8	h10	1,80	H8	h10	1,40	H8	h10	0,90	H8	h10	0,70
8,0	H8	h10	2,00	H8	h10	1,60	H8	h10	1,10	H8	h10	0,90

Gap dimension X2

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

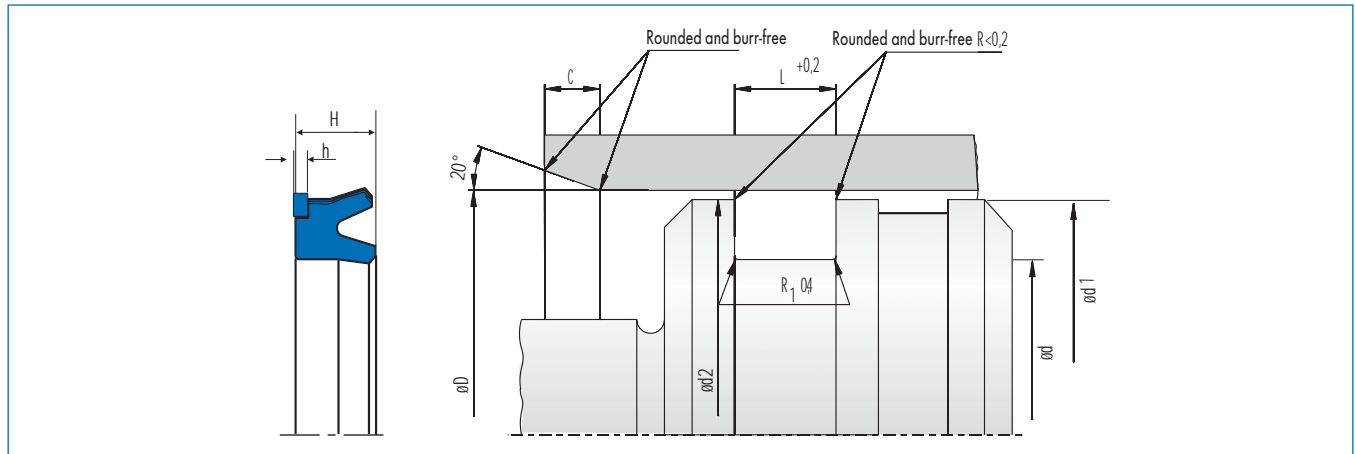
Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

Fitting & installation

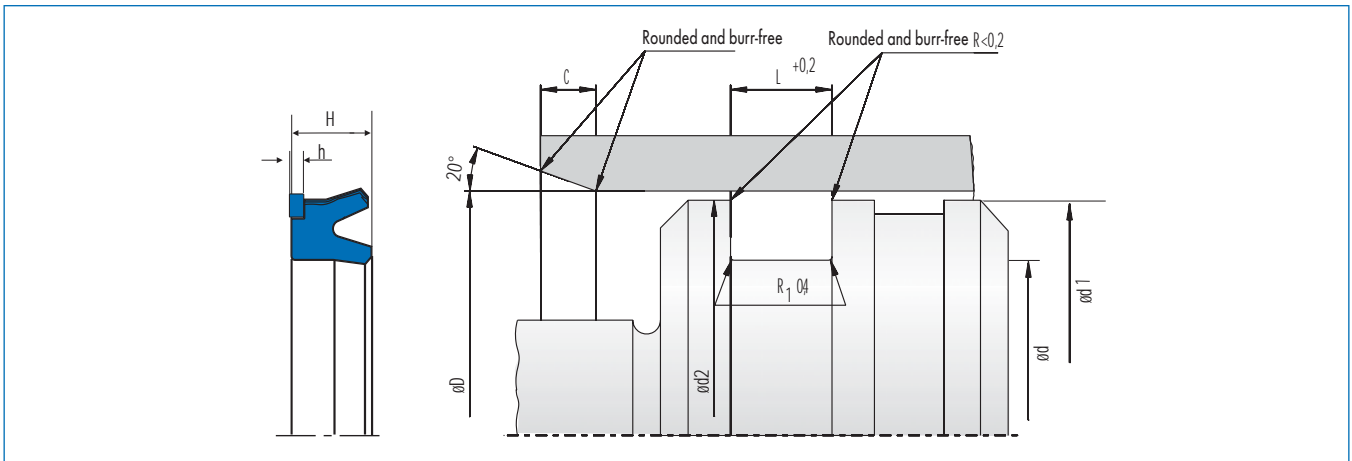
Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



D	d	H	L	Profile	Height H of back-up ring	Material	Article No.	
80	65	11,8	13	7,5	2,5	80 NBR B246	24142953	○
100	85	11,8	13	7,5	2,5	80 NBR B246	24140707	○
125	105	15	16	10	2,5	80 NBR B246	24142955	○
160	140	15	16	10	2,5	80 NBR B246	24142958	○
200	175	18,8	20	12,5	2,5	80 NBR B246	24142961	○
220	190	22	23	15	4	80 NBR B246	24238654	○
250	220	22	23	15	3,5	80 NBR B246	24299010	○
250	225	18,8	20	12,5	2,5	80 NBR B246	24142964	○
270	240	22	23	15	4	80 NBR B246	24244485	○
300	270	19	20	15	5	80 NBR B246	24265068	○
310	280	22	22,3	15	4	80 NBR B246	24240365	○
320	290	23,5	25	15	2,5	80 NBR B246	24142967	○
330	300	22	23	15	4	80 NBR B246	24238760	○
340	310	22	23	15	3,5	80 NBR B246	24301449	○
350	320	22	23	15	4	80 NBR B246	24265069	○
350	320	22	23	15	4	80 NBR B246	24334236	○
360	330	25	26	15	3,5	80 NBR B246	24308767	○
370	330	28	29,5	20	5	80 NBR B246	24297841	○
380	350	25	26	15	4	80 NBR B246	24240361	○
400	360	30,5	32	20	2,5	80 NBR B246	24142970	○
400	370	25	26	15	4	80 NBR B246	24241348	○
420	390	25	26	15	4	80 NBR B246	24238275	○
430	400	25	26	15	4	80 NBR B246	24292148	○
450	410	30	32	20	6	80 NBR B246	24245119	○
450	420	25	26	15	4	80 NBR B246	24240357	○
450	420	25	26	15	4	80 NBR B246	24245122	○
470	440	25	26	15	4	80 NBR B246	24266415	○
480	450	25	26	15	4	80 NBR B246	24249169	○
490	450	34	35,5	20	5	80 NBR B246	24297820	○
500	470	25	26	15	4	80 NBR B246	24292218	○
530	500	25	26	15	4	80 NBR B246	24241691	○
670	630	25	28	20	4	80 NBR B246	24250325	○
680	640	30	32	20	6	80 NBR B246	24237741	○
680	640	30	32	20	6	80 NBR B246	24265070	○
710	670	25	26,5	20	6	80 NBR B246	24238026	○

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d	H	L	Profile	Height H of back-up ring	Material	Article No.	
710	670	25	28	20	6	80 NBR B246	24245120	○
750	710	25	26,5	20	5	80 NBR B246	24294439	○
800	750	32	33,5	25	8	80 NBR B246	24265071	○
850	800	32	34	25	5	80 NBR B246	24294586	○
900	850	32	34	25	5	80 NBR B246	24294442	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel U-Ring Seal Set 0217

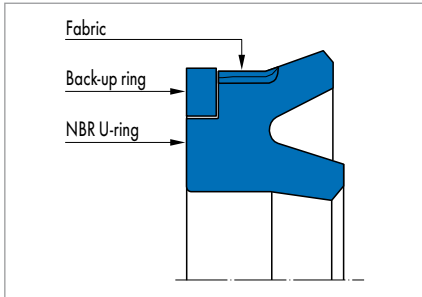


Fig. 1 Merkel U-Ring Seal Set 0217

Product description

Two-piece Merkel seal set comprising an elastomer U-ring with an elastomer sealing edge, a fabric reinforcement on the contact area and an active back-up ring.

Product advantages

Single-acting piston seal for use in hydraulics or pneumatics

- Low friction due to fabric reinforcement
- Large range of dimensions
- Activated back-up ring prevents extrusion.

Application

Pneumatic applications.

Material

U-ring

Material	Code
NBR U-ring	80 NBR B246
Cotton fabric	BI-NBR B4 B248

Back-up ring

	Material	Code
D <300 mm	POM	POM PO202
D >300 mm	Polyamide	PA 6.G200

Other materials like PTFE bronze back-up ring on enquiry.

Operating conditions

Material	80 NBR B246/ BI-NBR B4B248/ POM PO202	80 NBR B246/ BI-NBR B4 B248/ PA 6.G200
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +100
HFA fluids	+5 ... +60	+5 ... +60
HFB fluids	+5 ... +60	+5 ... +60
HFC fluids	-30 ... +60	-30 ... +60
HFD fluids	-	-
Water	+5 ... +100	+5 ... +100
HETG (rapeseed oil)	-30 ... +80	-30 ... +80
HEES (synthetic esters)	-30 ... +80	-30 ... +80
HEPG (glycol)	-30 ... +60	-30 ... +60
Mineral greases	-30 ... +100	-30 ... +100
Pressure p in MPa Hydraulic	25 or 40*	
Pressure p in MPa Pneumatic	5	
Running speed v in m/s	1,5	

* max. pressure depends on the profile.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Max. admissible gap dimensions

Back-up ring height h	16 MPa			26 MPa			32 MPa			40 MPa		
	D	d	X2	D	d	X2	D	d	X2	D	d	X2
1,5	H8	h10	0,50	H8	h10	0,50	H8	h10	0,40	H8	h10	0,30
2,5	H8	h10	0,80	H8	h10	0,70	H8	h10	0,60	H8	h10	0,40
3,0	H8	h10	0,80	H8	h10	0,70	H8	h10	0,60	H8	h10	0,40
3,5	H8	h10	1,20	H8	h10	1,00	H8	h10	0,65	H8	h10	0,50
4,0	H8	h10	1,20	H8	h10	1,00	H8	h10	0,65	H8	h10	0,50
5,0	H8	h10	1,80	H8	h10	1,40	H8	h10	0,90	H8	h10	0,70
6,0	H8	h10	1,80	H8	h10	1,40	H8	h10	0,90	H8	h10	0,70
8,0	H8	h10	2,00	H8	h10	1,60	H8	h10	1,10	H8	h10	0,90

Gap dimension X2

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

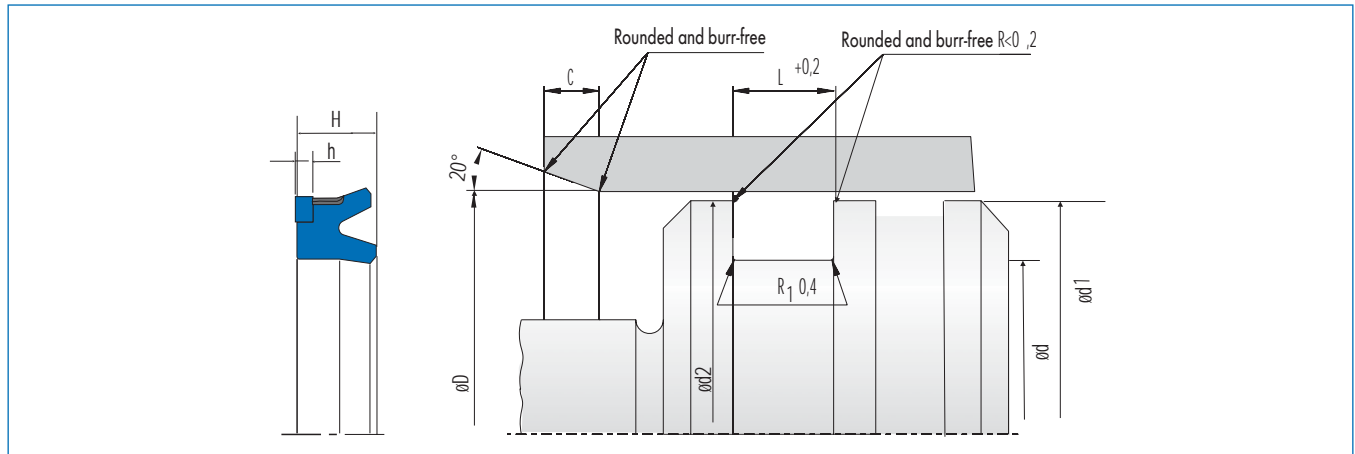
Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

Fitting & installation

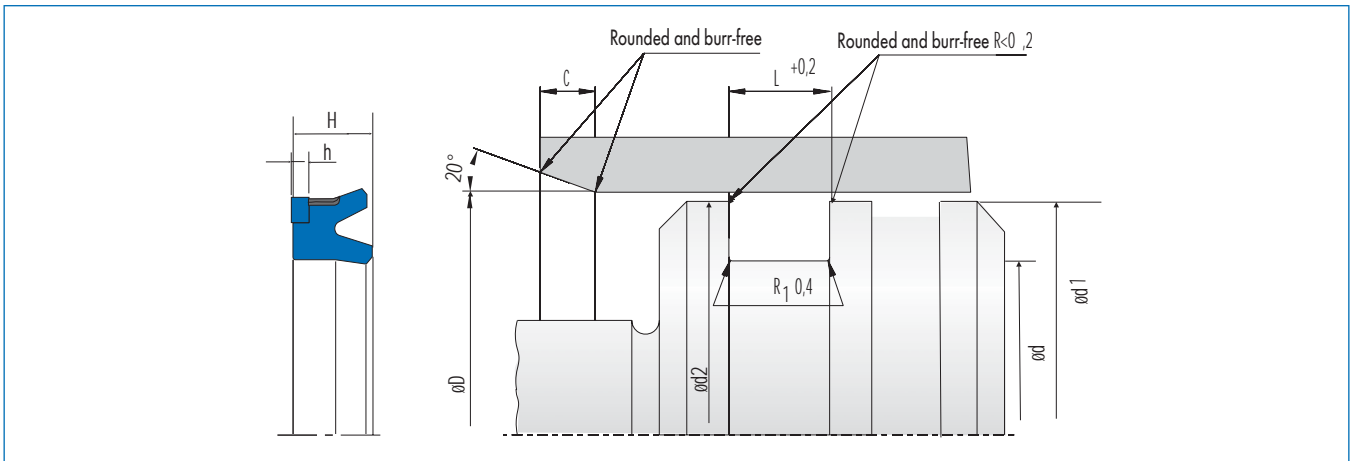
Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



D	d	H	L	Profile	Height H of back-up ring	Material	Article No.	
200	170	22	23	15	3,5	80 NBR B246	24291117	○
220	190	22	23	15	4	80 NBR B246	24245130	○
228,6	196,8	22,2	23,4	15,9	3	80 NBR B246	24245133	○
235	205	18	19	15	3,5	80 NBR B246	24298553	○
240	210	22	23	15	4	80 NBR B246	24265118	○
250	220	22	23	15	3,5	80 NBR B246	24291116	○
250	225	18,8	20	12,5	2,5	85 NBR B248	24245127	○
270	240	22	23	15	4	80 NBR B246	24245131	○
300	270	19	20			80 NBR B246	24265068	○
300	270	22	23	15	3,5	80 NBR B246	24292037	○
310	280	22	23	15	4	80 NBR B246	24245128	○
320	290	23,5	25	15	2,5	80 NBR B246	24245126	○
330	300	22	23	15	4	80 NBR B246	24245134	○
340	310	22	23	15	3,5	80 NBR B246	24301448	○
350	320	22	23			80 NBR B246	24265069	○
350	320	22	23	15	4	80 NBR B246	24269895	○
360	330	25	26	15	3,5	80 NBR B246	24290774	○
380	350	25	26	15	4	80 NBR B246	24245490	○
400	360	30,5	32	20	2,5	80 NBR B246	24245491	○
420	390	25	26	15	4	80 NBR B246	24245492	○
430	400	25	26	15	4	80 NBR B246	24292147	○
450	410	30	32	20	6	80 NBR B246	24245493	○
450	420	25	26	15	4	80 NBR B246	24240357	○
450	420	25	26			80 NBR B246	24245122	○
470	440	25	26	15	4	80 NBR B246	24266415	○
470	440	25	26	15	4	80 NBR B246	24266416	○
480	450	25	26			80 NBR B246	24249169	○
480	450	25	26	15	4	80 NBR B246	24250323	○
500	460	23,9	25,4	20	5	80 NBR B246	24351681	○
500	470	25	26	15	4	80 NBR B246	24269878	○
530	500	25	26	15	4	80 NBR B246	24245121	○
560	530	25	26	15	4	80 NBR B246	24266461	○
600	560	25	26,5	20	4	80 NBR B246	24250324	○
630	580	32	34	25	5	80 NBR B246	24331932	○
630	600	25	26	15	5	80 NBR B246	24269879	○

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d	H	L	Profile	Height H of back-up ring	Material	Article No.	
670	630	25	26,5	20	4	80 NBR B246	24250098	○
670	630	25	28			80 NBR B246	24250325	○
680	640	30	32	20	6	80 NBR B246	24237741	○
680	640	30	32			80 NBR B246	24265070	○
710	670	25	26,5	20	6	80 NBR B246	24238026	○
750	710	25	26,5	20	5	80 NBR B246	24289980	○
800	750	32	33,5			80 NBR B246	24265071	○
800	750	32	33,5	25	8	80 NBR B246	24269896	○
850	800	32	34	25	5	80 NBR B246	24294582	○
900	850	32	34	25	5	80 NBR B246	24294445	○
950	900	32	34	25	5	80 NBR B246	24295008	○
1000	950	32	34	25	8	80 NBR B246	24269897	○
1060	1000	40	42	30	8	80 NBR B246	24297224	○
1120	1060	40	42	30	8	80 NBR B246	24294591	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Omegat OMK-PU

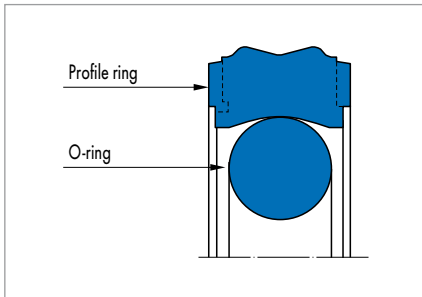


Fig. 1 Merkel Omegat OMK-PU

Product description

Two-piece Merkel piston seal set comprising one polyurethane profile ring with one O-ring as a pre-load component.

Product advantages

Merkel Omegat OMK-PU is used for sealing pistons with pressure on both sides for medium duty applications, and is also designed for housings according to ISO 7425 , Part 1

- Increased sealing effect
- Robust design
- Requires small housing
- Easy fitting.

Application

Industrial vehicles, agricultural machinery, cranes, standard cylinders.

Material

Profile ring

Material	Code	Hardness
Polyurethane	95 AU V142	95 Shore A

Elastomer profile ring

Material	Code	Hardness
Nitrile rubber NBR	70 NBR B276	70 Shore A

Other materials are available on request.

Operating conditions

Material	95 AU V142/ 70 NBR B276
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +100
Pressure p in MPa	25
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 μm	≤2,5 μm
Groove base	≤1,6 μm	≤6,3 μm
Groove flanks	≤3,0 μm	≤15,0 μm

Percentage contact area M_c >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Profile	Max. permissible gap dimension			
	16 MPa		26 MPa	
	60 °C	80 °C	60 °C	80 °C
≤10,5	0,50	0,40	0,35	0,24

Tolerance recommendation and dimension d2

When designing d2, the admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account. → Technical Manual. Regard must be paid to the dimensions d1 and dF in connection with the guide element used.

Tolerance recommendations for piston designs with guide ring

Nominal Ø D	16 MPa		26 MPa	
	D	d	D	d
≤200	H8	h7	H8	h7

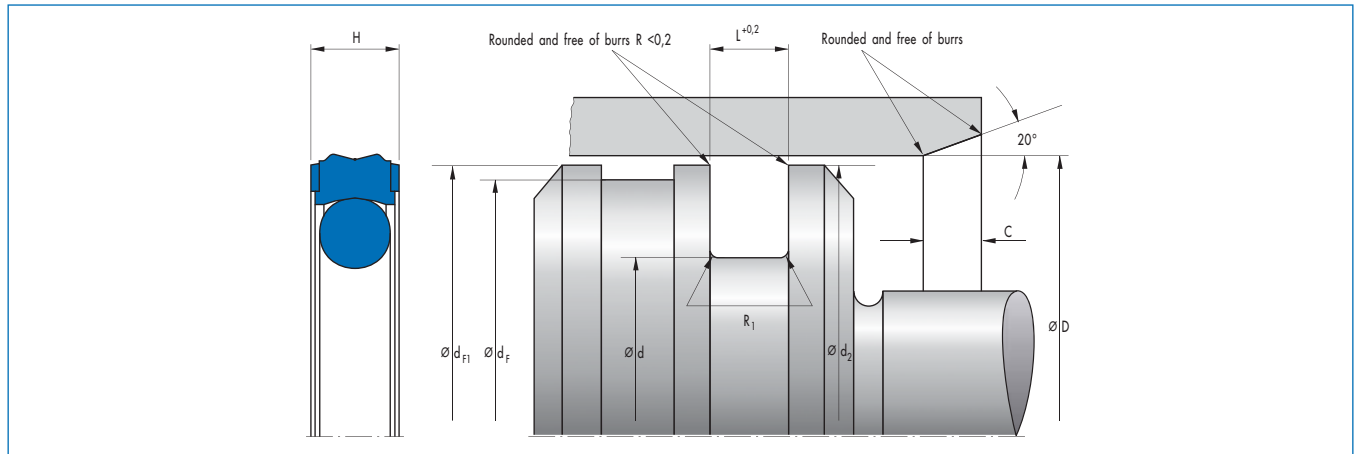
Tolerance recommendations for piston designs with metallic guide

Nominal Ø D	D	d
≤80	H9	f8
80 ... 160	H8	f7
160 ... 200	H7	f7

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



D	d	H	L	Profile	C	R ₁	Housing	Material	Article No.	
20	12,5	3	3,2	3,75	3	0,5	ISO	95 AU V142	24341354	○
32	21	4	4,2	5,5	4,5	0,5	ISO	95 AU V142	24341356	○
40	29	4	4,2	5,5	4,5	0,5	ISO	95 AU V142	24341357	○
45	34	4	4,2	5,5	4,5	0,5		95 AU V142	24341025	○
50	34,5	6	6,3	7,75	6	0,5	ISO	95 AU V142	24341045	○
50	39	4	4,2	5,5	4,5	0,5	ISO	95 AU V142	24341050	○
55	39,5	6	6,3	7,75	4,5	0,5		95 AU V142	24361251	○
55	44	4	4,2	5,5	4,5	0,5		95 AU V142	24341026	○
60	49	4	4,2	5,5	4,5	0,5		95 AU V142	24341027	○
63	47,5	6	6,3	7,75	6	0,5	ISO	95 AU V142	24341046	○
63	52	4	4,2	5,5	4,5	0,5	ISO	95 AU V142	24341049	○
65	54	4	4,2	5,5	4,5	0,9		95 AU V142	24341028	○
70	59	4	4,2	5,5	4,5	0,9		95 AU V142	24341029	○
80	64,5	6	6,3	7,75	6	0,9		95 AU V142	24333982	○
90	74,5	6	6,3	7,75	6	0,9		95 AU V142	24341022	○
100	84,5	6	6,3	7,75	6	0,9	ISO	95 AU V142	24333983	○
110	94,5	6	6,3	7,75	6	0,9		95 AU V142	24341023	○
120	104,5	6	6,3	7,75	6	0,9		95 AU V142	24341024	○
125	104	7,7	8,1	10,5	8	0,9	ISO	95 AU V142	24341056	○
125	109,5	6	6,3	7,75	6	0,9	ISO	95 AU V142	24341358	○
140	119	7,7	8,1	10,5	8	0,9		95 AU V142	24341047	○
160	139	7,7	8,1	10,5	8	0,9	ISO	95 AU V142	24341048	○
200	179	7,7	8,1	10,5	8	0,9	ISO	95 AU V142	24341359	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Omegat OMK-E

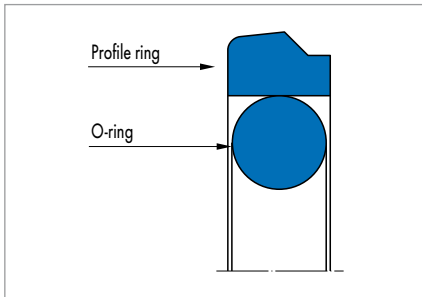


Fig. 1 Merkel Omegat OMK-E

Product description

Two-piece Merkel seal set for sealing pistons, consisting of one PTFE profile ring and an O-ring as a pre-load component.

Product advantages

Merkel Omegat OMK-E can be used where a sealing piston has pressure on one side, amongst others, in standardised housings according to ISO 7425/1. Rod diameters in agreement with ISO 3320.

- Very high resistance to pressure and hardness
- Good thermal conductivity
- Very good protection against extrusion
- High resistance to abrasion
- Low friction, free of stick-slip.

Application

Handling equipment, agricultural machinery, injection moulding machines, presses, marine hydraulics, industrial vehicles, cranes, mills, control and regulation equipment.

Material

PTFE profile ring

Material	Code
PTFE bronze compound	PTFE B602
PTFE glass MoS ₂ compound	PTFE GM201

O-ring

Material	Code	Hardness
NBR	70 NBR B276	70 Shore A
FKM	70 FKM K655	70 Shore A

Operating conditions

Material	PTFE GM201/ 70 NBR B276	PTFE B602/ 70 NBR B276	PTFE B602/ 70 FKM K655
	Temperature range in °C		
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +100	-10 ... +200
HFA fluids	+5 ... +60	-	-
HFB fluids	+5 ... +60	-	-
HFC fluids	-30 ... +60	-	-
HFD fluids	-	-	-10 ... +200
Water	+5 ... +100	-	-
HETG (rapeseed oil)	-30 ... +80	-30 ... +80	-10 ... +80
HEES (synthetic esters)	-30 ... +80	-30 ... +80	-10 ... +100
HEPG (glycol)	-30 ... +60	-30 ... +60	-10 ... +80
Mineral greases	-30 ... +100	-30 ... +100	-10 ... +200
Pressure p in MPa	40		
Running speed v in m/s	5		

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Profile		Max. permissible gap dimension			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
2,2	2,45	0,35	0,30	-	-
3,2	3,65	0,40	0,35	-	-
4,2	5,35	0,50	0,40	0,30	-
6,3	7,55	0,55	0,45	0,35	0,30
8,1	10,25	0,60	0,50	0,40	0,40
8,1	12,00	0,70	0,60	0,55	0,50
9,5	13,65	0,75	0,65	0,60	0,55

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

Tolerance recommendations – for non-metallic guides

2,45 ... 7,55	16 MPa		26 MPa		32 MPa		40 MPa	
Nominal Ø D	D	d	D	d	D	d	D	d
<270	H8	h8	H8	h8	H8	h8	H8	h8
10,25	16 MPa		26 MPa		32 MPa		40 MPa	
Nominal Ø D	D	d	D	d	D	d	D	d
<500	H8	h8	H8	h8	H8	h8	H8	h8
500 ... 690	H8	h7	H8	h7	H8	h7	H8	h7
12,00	16 MPa		26 MPa		32 MPa		40 MPa	
Nominal Ø D	D	d	D	d	D	d	D	d
<500	H8	h8	H8	h8	H8	h8	H8	h8
500 ... 690	H8	h7	H8	h7	H8	h7	H8	h7
13,65	16 MPa		26 MPa		32 MPa		40 MPa	
Nominal Ø D	D	d	D	d	D	d	D	d
<1000	H8	h7	H8	h7	H8	h7	H8	h7
1000 ... 1100	H8	h7	H8	h7	H7	h7	H7	h7

Regard must be paid to the dimensions d1 and dF in connection with the guide element used.

Material selection table

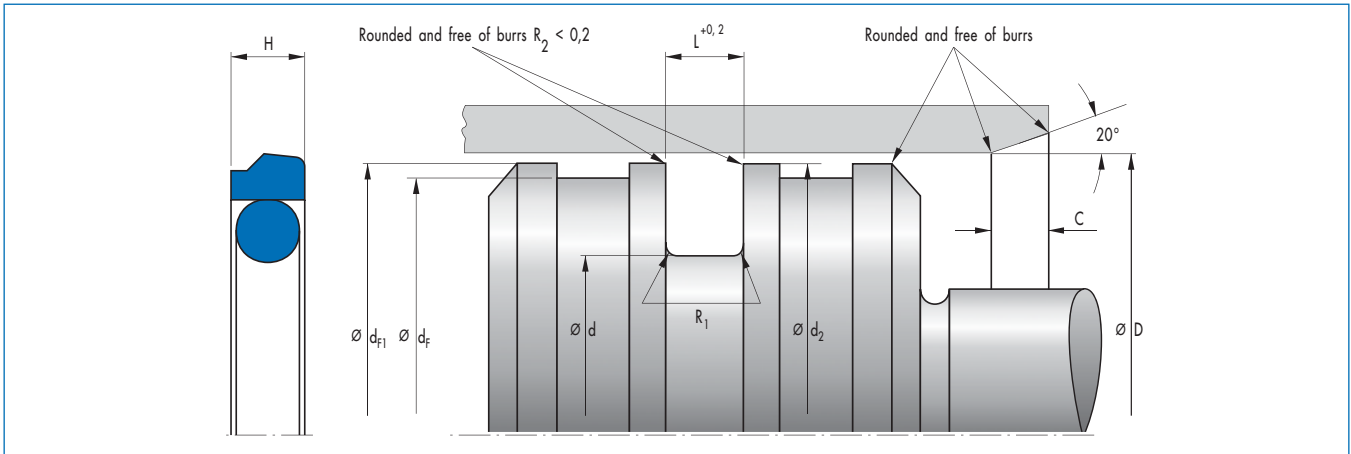
	PTFE GM201/ 70 NBR B276 (PTFE-Glass-MoS ₂ / NBR)	PTFE B602/ 70 NBR B276 (PTFE bronze/ NBR)	PTFE B602/ 70 FKM K655 (PTFE bronze/ FKM)
Oil hydraulics -30 ... +100 °C	●	●	○
Oil hydraulics -10 ... +200 °C	○	○	●
Short stroke, high frequency	●	○	○
Water hydraulics	●	○	○
Soft counterface	●	○	○

● = suitable; ● = possible; ○ = not suitable.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal. → Technical Manual. When mounting the Merkel Omegat OMK-E, ensure correct placement of the sealing edge to the pressure direction. A fitting jig facilitates the installation of small Omegat rings.

Article list

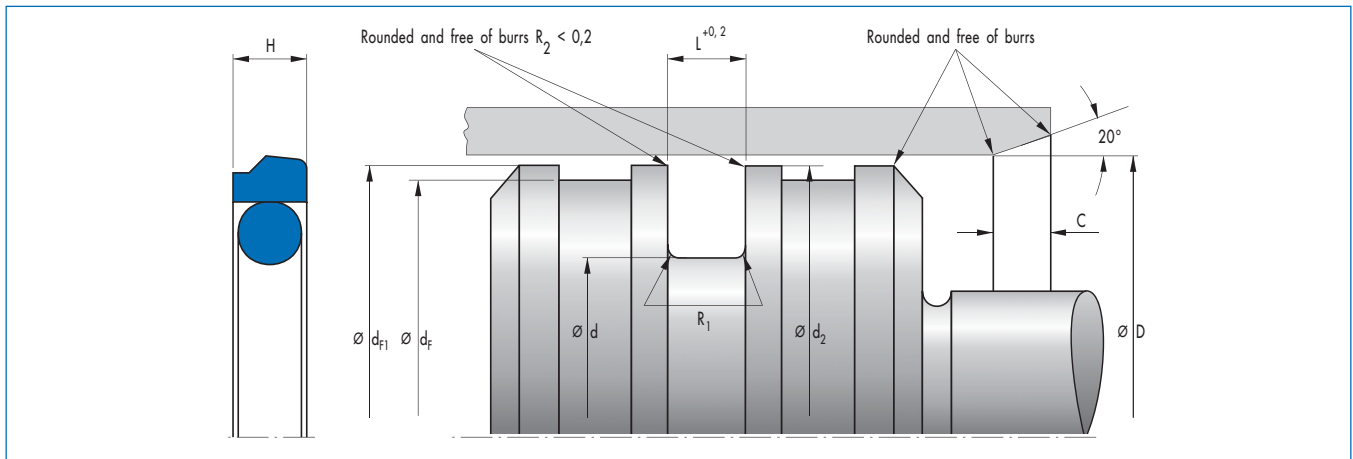


D	d	H	L	Profile	C	R ₁	Material	Article No.	
8	3,1	2	2,2	2,45	3	0,3	PTFE B602 / FKM	24262428	○
8	3,1	2	2,2	2,45	3	0,3	PTFE B602 / NBR	24275916	○
8	3,1	2	2,2	2,45	3	0,3	PTFE GM201 / NBR	24276238	○
10	5,1	2	2,2	2,45	3	0,3	PTFE B602 / NBR	24275925	●
10	5,1	2	2,2	2,45	3	0,3	PTFE GM201 / NBR	24276247	○
10	5,1	2	2,2	2,45	3	0,3	PTFE B602 / FKM	24345101	○
12	7,1	2	2,2	2,45	3	0,3	PTFE B602 / NBR	24275944	●
12	7,1	2	2,2	2,45	3	0,3	PTFE GM201 / NBR	24276265	○
12	7,1	2	2,2	2,45	3	0,3	PTFE B602 / FKM	24345102	○
14	9,1	2	2,2	2,45	3	0,3	PTFE B602 / NBR	24256812	●
14	9,1	2	2,2	2,45	3	0,3	PTFE GM201 / NBR	24276368	○
14	9,1	2	2,2	2,45	3	0,3	PTFE B602 / FKM	24345103	○
15	10,1	2	2,2	2,45	3	0,3	PTFE B602 / NBR	24276002	○
15	10,1	2	2,2	2,45	3	0,3	PTFE GM201 / NBR	24276346	○
15	10,1	2	2,2	2,45	3	0,3	PTFE B602 / FKM	24345104	○
16	11,1	2	2,2	2,45	3	0,3	PTFE B602 / NBR	24275929	○
16	11,1	2	2,2	2,45	3	0,3	PTFE GM201 / NBR	24276250	○
18	10,7	3	3,2	3,65	4,5	0,5	PTFE B602 / NBR	24275921	○
18	10,7	3	3,2	3,65	4,5	0,5	PTFE GM201 / NBR	24276243	○
18	10,7	3	3,2	3,65	4,5	0,5	PTFE B602 / FKM	24345106	○
20	12,7	3	3,2	3,65	4,5	0,5	PTFE GM201 / NBR	24231905	○
20	12,7	3	3,2	3,65	4,5	0,5	PTFE B602 / NBR	24248890	●
20	12,7	3	3,2	3,65	4,5	0,5	PTFE B602 / FKM	24339788	○
22	14,7	3	3,2	3,65	4,5	0,5	PTFE B602 / NBR	24275923	○
22	14,7	3	3,2	3,65	4,5	0,5	PTFE GM201 / NBR	24276245	○
22	14,7	3	3,2	3,65	4,5	0,5	PTFE B602 / FKM	24345107	○
25	17,7	3	3,2	3,65	4,5	0,5	PTFE B602 / NBR	24260930	●
25	17,7	3	3,2	3,65	4,5	0,5	PTFE B602 / FKM	24260932	○
25	17,7	3	3,2	3,65	4,5	0,5	PTFE GM201 / NBR	24275717	○
28	17,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24275935	○
28	17,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276256	○
28	17,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24345108	○
30	19,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24275926	●
30	19,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276248	○
30	19,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24316411	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	L	Profile	C	R ₁	Material	Article No.	
32	21,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24258449	○
32	21,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276370	○
32	21,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24345109	○
35	24,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24257786	○
35	24,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276369	○
35	24,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24339868	○
36	25,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24276021	○
36	25,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276364	○
36	25,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24345110	○
38	27,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24275930	○
38	27,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276251	○
40	29,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24249194	●
40	29,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276367	○
40	29,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24316410	●
42	31,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24275932	○
42	31,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276253	○
42	31,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24345112	○
45	34,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24269472	○
45	34,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24275914	●
45	34,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276236	○
48	37,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24275934	○
48	37,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276255	○
48	37,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24345113	○
50	39,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24258849	○
50	39,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24258850	●
50	39,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24345114	○
55	44,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24275936	●
55	44,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276257	○
55	44,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24334506	○
56	45,3	4	4,2	5,35	6	0,8	PTFE B602 / NBR	24276014	○
56	45,3	4	4,2	5,35	6	0,8	PTFE GM201 / NBR	24276358	○
56	45,3	4	4,2	5,35	6	0,8	PTFE B602 / FKM	24345115	○
60	44,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24269473	○
60	44,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275938	●
60	44,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24290446	○
63	47,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24260919	○
63	47,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24274574	○
63	47,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275917	●
65	49,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275940	●
65	49,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24276261	○
65	49,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345116	○
68	52,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / FKM	533174	○
70	54,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24276004	●
70	54,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24276348	○
70	54,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345117	○
75	59,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275942	●
75	59,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24276263	○
75	59,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345118	○
80	64,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24192313	○
80	64,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24269662	○

● Available from stock ○ On request: Tool is available, delivery at short notice

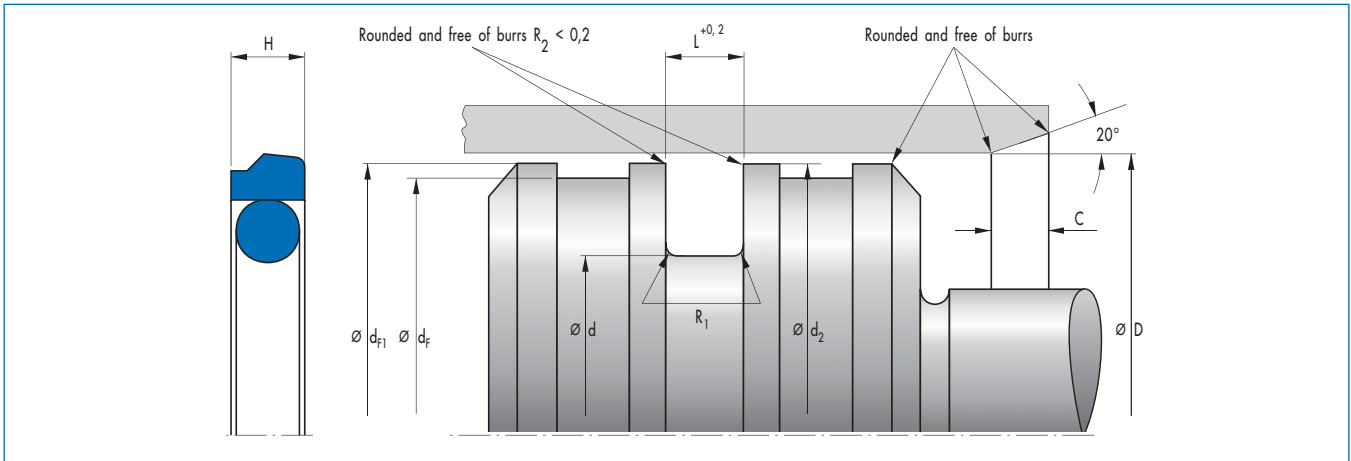


D	d	H	L	Profile	C	R ₁	Material	Article No.	
80	64,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275984	●
85	69,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275915	○
85	69,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24276237	○
85	69,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24356574	○
90	74,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24276020	○
90	74,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24276363	○
90	74,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345119	○
95	79,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24245655	○
95	79,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24259254	○
95	79,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24356575	○
100	84,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24148860	●
100	84,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275986	●
100	84,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24338059	○
105	89,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24187342	○
105	89,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275948	●
105	89,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345121	○
110	94,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24276006	●
110	94,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24276350	○
110	94,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345122	○
115	99,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24242319	○
115	99,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275950	○
115	99,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24302827	○
120	104,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24139834	○
120	104,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24258844	●
120	104,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345123	○
125	104,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24356576	○
125	104,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24356586	○
125	104,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24356597	○
125	109,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24198545	○
125	109,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24274575	●
125	109,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345124	○
130	109,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24356577	○
130	109,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24356587	○
130	109,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24356598	○
130	114,9	5,9	6,3	7,55	9	12	PTFE B602 / NBR	24258843	○
130	114,9	5,9	6,3	7,55	9	12	PTFE GM201 / NBR	24276371	○
130	114,9	5,9	6,3	7,55	9	12	PTFE B602 / FKM	24345125	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	L	Profile	C	R ₁	Material	Article No.	
135	114,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24356578	○
135	114,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24356588	○
135	114,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24356599	○
135	119,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275954	○
135	119,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24276272	○
135	119,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345126	○
140	119,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24356579	○
140	119,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24356589	○
140	119,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24356600	○
140	124,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275990	●
140	124,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24276336	○
140	124,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24327625	○
145	129,9	5,9	6,3	7,55	3	1,2	PTFE B602 / NBR	24351730	○
150	129,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24356580	○
150	129,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24356590	○
150	129,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24356601	○
150	134,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275956	●
150	134,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24276274	○
150	134,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345127	○
160	139,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24356581	○
160	139,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24356591	○
160	139,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24356602	○
160	144,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24274576	○
160	144,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24276008	●
160	144,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345128	○
170	149,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24356582	○
170	149,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24356592	○
170	149,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24356603	○
170	154,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275958	●
170	154,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24276276	○
170	154,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345129	○
180	159,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24356583	○
180	159,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24356593	○
180	159,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24356604	○
180	164,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24257397	○
180	164,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24275992	●
180	164,9	5,9	6,3	7,55	9	1,2	PTFE B602 / FKM	24345130	○
190	169,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24356594	○
190	169,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24356605	○
190	174,9	5,9	6,3	7,55	9	1,2	PTFE B602 / NBR	24356595	○
190	174,9	5,9	6,3	7,55	9	1,2	PTFE GM201 / NBR	24356606	○
190	174,9	6,3	6,3	7,55	9	1,2	PTFE B602 / FKM	24345131	○
200	179,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24239837	○
200	179,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24276022	●
210	189,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24275962	●
210	189,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24276280	○
210	189,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24345133	○
215	194,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	525317	○
220	199,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24208106	○
220	199,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24275994	○

● Available from stock ○ On request: Tool is available, delivery at short notice

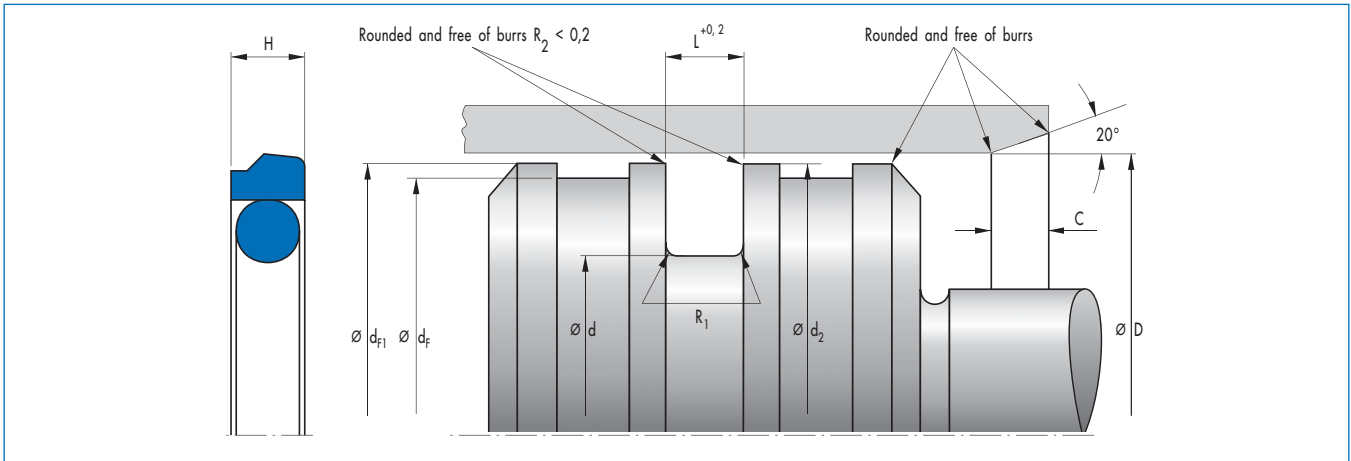


D	d	H	L	Profile	C	R ₁	Material	Article No.	
220	199,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24345134	○
230	209,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24275964	○
230	209,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24276282	●
230	209,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24345135	○
240	219,5	7,6	8,1	10,25	12	2	PTFE B602 / NBR	24276010	○
240	219,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24276354	○
240	219,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24345136	○
250	229,5	7,6	8,1	10,25	12	2	PTFE GM201 / NBR	24245626	○
250	229,5	7,6	8,1	10,25	12	2	PTFE B602 / FKM	24345137	○
250	229,5	7,7	8,1	10,25	12	2	PTFE B602 / NBR	24263958	●
260	236	7,6	8,1	12	14	2	PTFE B602 / NBR	24275996	○
260	236	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276340	○
260	236	7,6	8,1	12	14	2	PTFE B602 / FKM	24345138	○
270	246	7,6	8,1	12	14	2	PTFE B602 / NBR	24275968	○
270	246	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276286	○
270	246	7,6	8,1	12	14	2	PTFE B602 / FKM	24345139	○
280	256	7,6	8,1	12	14	2	PTFE GM201 / NBR	24267603	○
280	256	7,6	8,1	12	14	2	PTFE B602 / NBR	24276018	●
280	256	7,6	8,1	12	14	2	PTFE B602 / FKM	24343298	○
290	266	7,6	8,1	12	14	2	PTFE B602 / NBR	24275970	○
290	266	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276288	○
290	266	7,6	8,1	12	14	2	PTFE B602 / FKM	24345141	○
300	276	7,6	8,1	12	14	2	PTFE B602 / NBR	24275998	●
300	276	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276342	○
300	276	7,6	8,1	12	14	2	PTFE B602 / FKM	24345142	○
310	286	7,6	8,1	12	14	2	PTFE B602 / NBR	24275972	●
310	286	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276290	○
310	286	7,6	8,1	12	14	2	PTFE B602 / FKM	24345143	○
320	296	7,6	8,1	12	14	2	PTFE B602 / NBR	24276012	●
320	296	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276356	○
320	296	7,6	8,1	12	14	2	PTFE B602 / FKM	24345144	○
330	306	7,6	8,1	12	14	2	PTFE B602 / NBR	24275974	●
330	306	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276292	○
330	306	7,6	8,1	12	14	2	PTFE B602 / FKM	24345145	○
340	316	7,6	8,1	12	14	2	PTFE B602 / NBR	24275924	●
340	316	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276246	○
340	316	7,6	8,1	12	14	2	PTFE B602 / FKM	24345146	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	L	Profile	C	R ₁	Material	Article No.	
350	326	7,6	8,1	12	14	2	PTFE B602 / NBR	24275918	○
350	326	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276240	○
350	326	7,6	8,1	12	14	2	PTFE B602 / FKM	24345147	○
360	336	7,6	8,1	12	14	2	PTFE GM201 / NBR	24242310	○
360	336	7,6	8,1	12	14	2	PTFE B602 / NBR	24275927	●
360	336	7,6	8,1	12	14	2	PTFE B602 / FKM	24345148	○
370	346	7,6	8,1	12	14	2	PTFE B602 / NBR	24275919	○
370	346	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276241	○
370	346	7,6	8,1	12	14	2	PTFE B602 / FKM	24345149	○
380	356	7,6	8,1	12	14	2	PTFE B602 / NBR	24275920	○
380	356	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276242	○
380	356	7,6	8,1	12	14	2	PTFE B602 / FKM	24345150	○
390	366	7,6	8,1	12	14	2	PTFE B602 / NBR	24275922	○
390	366	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276244	○
390	366	7,6	8,1	12	14	2	PTFE B602 / FKM	24345151	○
400	376	7,6	8,1	12	14	2	PTFE B602 / NBR	24234456	●
400	376	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276366	○
400	376	7,6	8,1	12	14	2	PTFE B602 / FKM	24345152	○
410	386	7,6	8,1	12	14	2	PTFE B602 / NBR	24275937	○
410	386	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276258	○
410	386	7,6	8,1	12	14	2	PTFE B602 / FKM	24345153	○
420	396	7,6	8,1	12	14	2	PTFE B602 / NBR	24275939	○
420	396	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276260	○
420	396	7,6	8,1	12	14	2	PTFE B602 / FKM	24345154	○
430	406	7,6	8,1	12	14	2	PTFE B602 / NBR	24275941	○
430	406	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276262	○
430	406	7,6	8,1	12	14	2	PTFE B602 / FKM	24345155	○
440	416	7,6	8,1	12	14	2	PTFE B602 / NBR	24275943	○
440	416	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276264	○
440	416	7,6	8,1	12	14	2	PTFE B602 / FKM	24354843	○
450	426	7,6	8,1	12	14	2	PTFE B602 / NBR	24275945	●
450	426	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276266	○
450	426	7,6	8,1	12	14	2	PTFE B602 / FKM	24345157	○
460	436	7,6	8,1	12	14	2	PTFE B602 / NBR	24275947	○
460	436	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276268	○
460	436	7,6	8,1	12	14	2	PTFE B602 / FKM	24345158	○
470	446	7,6	8,1	12	14	2	PTFE B602 / NBR	24275949	○
470	446	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276269	○
470	446	7,6	8,1	12	14	2	PTFE B602 / FKM	24345159	○
480	456	7,6	8,1	12	14	2	PTFE B602 / NBR	24275951	○
480	456	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276270	○
480	456	7,6	8,1	12	14	2	PTFE B602 / FKM	24345160	○
490	466	7,6	8,1	12	14	2	PTFE B602 / NBR	24275953	○
490	466	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276271	○
490	466	7,6	8,1	12	14	2	PTFE B602 / FKM	24345161	○
500	476	7,6	8,1	12	14	2	PTFE B602 / NBR	24275955	●
500	476	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276273	○
500	476	7,6	8,1	12	14	2	PTFE B602 / FKM	24345162	○
510	486	7,6	8,1	12	14	2	PTFE B602 / NBR	24275957	○
510	486	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276275	○

● Available from stock ○ On request: Tool is available, delivery at short notice

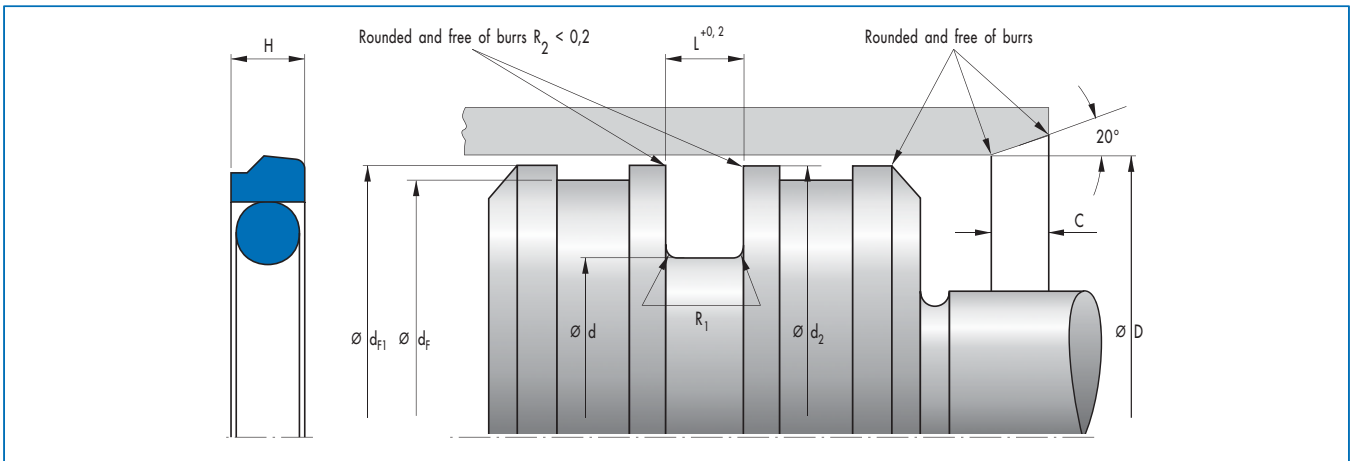


D	d	H	L	Profile	C	R ₁	Material	Article No.	
510	486	7,6	8,1	12	14	2	PTFE B602 / FKM	24345163	○
520	496	7,6	8,1	12	14	2	PTFE B602 / NBR	24275959	○
520	496	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276277	○
520	496	7,6	8,1	12	14	2	PTFE B602 / FKM	24345164	○
530	506	7,6	8,1	12	14	2	PTFE B602 / NBR	24275961	○
530	506	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276279	○
530	506	7,6	8,1	12	14	2	PTFE B602 / FKM	24354844	○
540	516	7,6	8,1	12	14	2	PTFE B602 / NBR	24275963	○
540	516	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276281	○
540	516	7,6	8,1	12	14	2	PTFE B602 / FKM	24345166	○
550	526	7,6	8,1	12	14	2	PTFE B602 / NBR	24275965	○
550	526	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276283	○
550	526	7,6	8,1	12	14	2	PTFE B602 / FKM	24345167	○
560	536	7,6	8,1	12	14	2	PTFE B602 / NBR	24275967	○
560	536	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276285	○
560	536	7,6	8,1	12	14	2	PTFE B602 / FKM	24345168	○
570	546	7,6	8,1	12	14	2	PTFE B602 / NBR	24275969	○
570	546	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276287	○
570	546	7,6	8,1	12	14	2	PTFE B602 / FKM	24345169	○
580	556	7,6	8,1	12	14	2	PTFE B602 / NBR	24275971	○
580	556	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276289	○
580	556	7,6	8,1	12	14	2	PTFE B602 / FKM	24345170	○
590	566	7,6	8,1	12	14	2	PTFE B602 / NBR	24275973	○
590	566	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276291	○
590	566	7,6	8,1	12	14	2	PTFE B602 / FKM	24345171	○
600	576	7,6	8,1	12	14	2	PTFE B602 / NBR	24275975	○
600	576	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276293	○
600	576	7,6	8,1	12	14	2	PTFE B602 / FKM	24345172	○
610	586	7,6	8,1	12	14	2	PTFE B602 / NBR	24275977	○
610	586	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276295	○
610	586	7,6	8,1	12	14	2	PTFE B602 / FKM	24345173	○
620	596	7,6	8,1	12	14	2	PTFE B602 / NBR	24275979	○
620	596	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276297	○
620	596	7,6	8,1	12	14	2	PTFE B602 / FKM	24345174	○
630	606	7,6	8,1	12	14	2	PTFE B602 / NBR	24275981	○
630	606	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276299	○
630	606	7,6	8,1	12	14	2	PTFE B602 / FKM	24345175	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	L	Profile	C	R ₁	Material	Article No.	
640	616	7,6	8,1	12	14	2	PTFE B602 / NBR	24275983	○
640	616	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276331	○
640	616	7,6	8,1	12	14	2	PTFE B602 / FKM	24345176	○
650	626	7,6	8,1	12	14	2	PTFE B602 / NBR	24275985	○
650	626	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276332	○
650	626	7,6	8,1	12	14	2	PTFE B602 / FKM	24345177	○
660	636	7,6	8,1	12	14	2	PTFE B602 / NBR	24275987	○
660	636	7,6	8,1	12	14	2	PTFE GM201 / NBR	24276333	○
660	636	7,6	8,1	12	14	2	PTFE B602 / FKM	24345178	○
670	642,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275989	○
670	642,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276335	○
670	642,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345179	○
680	652,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24269413	○
680	652,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276337	○
680	652,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345180	○
690	662,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275993	○
690	662,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276338	○
690	662,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345181	○
700	672,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275995	○
700	672,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276339	○
700	672,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345182	○
710	682,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275997	○
710	682,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276341	○
710	682,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345183	○
720	692,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275999	○
720	692,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276343	○
720	692,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345184	○
730	702,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276001	○
730	702,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276345	○
730	702,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345185	○
740	712,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276003	○
740	712,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276347	○
740	712,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345186	○
750	722,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276005	○
750	722,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276349	○
750	722,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345187	○
760	732,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276007	○
760	732,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276351	○
760	732,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345188	○
770	742,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276009	○
770	742,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276353	○
770	742,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345189	○
780	752,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276011	○
780	752,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276355	○
780	752,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345190	○
790	762,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24267605	○
790	762,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276013	○
790	762,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345191	○
800	772,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276015	○
800	772,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276359	○

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d	H	L	Profile	C	R ₁	Material	Article No.	
800	772,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345192	○
810	782,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276017	○
810	782,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276361	○
810	782,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345193	○
820	792,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276019	○
820	792,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276362	○
820	792,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345194	○
830	802,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276023	○
830	802,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276365	○
830	802,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345195	○
840	812,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276344	○
840	812,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345196	○
850	822,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275933	○
850	822,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276254	○
850	822,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345197	○
860	832,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275931	○
860	832,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276252	○
860	832,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345198	○
870	842,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275966	○
870	842,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276284	○
870	842,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345199	○
880	852,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24276016	○
880	852,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276360	○
880	852,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345200	○
890	862,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275988	○
890	862,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276334	○
890	862,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345201	○
900	872,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275946	○
900	872,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276267	○
900	872,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345202	○
910	882,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275982	○
910	882,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276300	○
910	882,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345203	○
920	892,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275980	○
920	892,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276298	○
920	892,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345204	○
930	902,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275978	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	L	Profile	C	R ₁	Material	Article No.	
930	902,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276296	<input type="radio"/>
930	902,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345205	<input type="radio"/>
940	912,7	8,7	9,5	13,65	15	2	PTFE B602 / NBR	24275928	<input type="radio"/>
940	912,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276249	<input type="radio"/>
940	912,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345206	<input type="radio"/>
950	922,7	8,7	9,5	13,65	15	2	PTFE B670 / NBR	24275976	<input type="radio"/>
950	922,7	8,7	9,5	13,65	15	2	PTFE GM201 / NBR	24276294	<input type="radio"/>
950	922,7	8,7	9,5	13,65	15	2	PTFE B602 / FKM	24345207	<input type="radio"/>

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Omegat OMK-ES

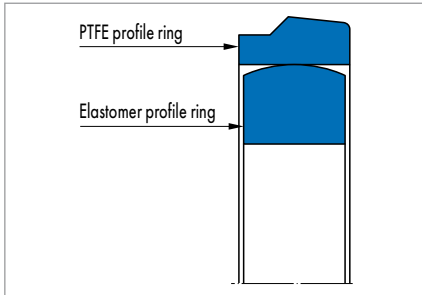


Fig. 1 Merkel Omegat OMK-ES

Product description

Two-piece Merkel seal set for sealing pistons, consisting of one PTFE profile ring and an elastomer profile ring as a pre-load component.

Product advantages

The Merkel Omegat OMK-ES is for use where sealing pistons have pressure on one side. The Merkel Omegat OMK-ES series is designed especially for large diameters and for heavy duty hydraulic applications

- Very high resistance to pressure
- Design prevents twisting
- Very good protection against extrusion
- High resistance to abrasion
- Good thermal conductivity
- Low friction, free of stick-slip
- High contact pressure due to elastomer profile ring.

Application

Injection moulding machines, presses, marine hydraulics, manipulators, mills, steel hydraulics engineering, large cylinders.

Material

PTFE profile ring

Material	Code
PTFE bronze compound	PTFE B602
PTFE glass MoS ₂ compound	PTFE GM201

Elastomer profile ring

Material	Code	Hardness
Nitrile rubber NBR	80 NBR B246	80 Shore A

Other materials are available on request.

Operating conditions

Material	PTFE B602/ 80 NBR B246	PTFE GM201/ 80 NBR B246
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +100
HFA fluids	-	+5 ... +60
HFB fluids	-	+5 ... +60
HFC fluids	-	-30 ... +60
HFD fluids	-	-
Water	-	+5 ... +100
HETG (rapeseed oil)	-30 ... +80	-30 ... +80
HEES (synthetic esters)	-30 ... +80	-30 ... +80
HEPG (glycol)	-30 ... +60	-30 ... +60
Mineral greases	-30 ... +100	-30 ... +100
Pressure p in MPa	40	
Running speed v in m/s	5	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Profile		Max. permissible gap dimension			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
10,0	10,0	0,60	0,50	0,40	0,40
12,5	12,5	0,75	0,65	0,55	0,50
15,0	15,0	0,75	0,65	0,55	0,50
17,5	17,5	0,75	0,65	0,55	0,50
20,0	20,0	0,80	0,70	0,60	0,55

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

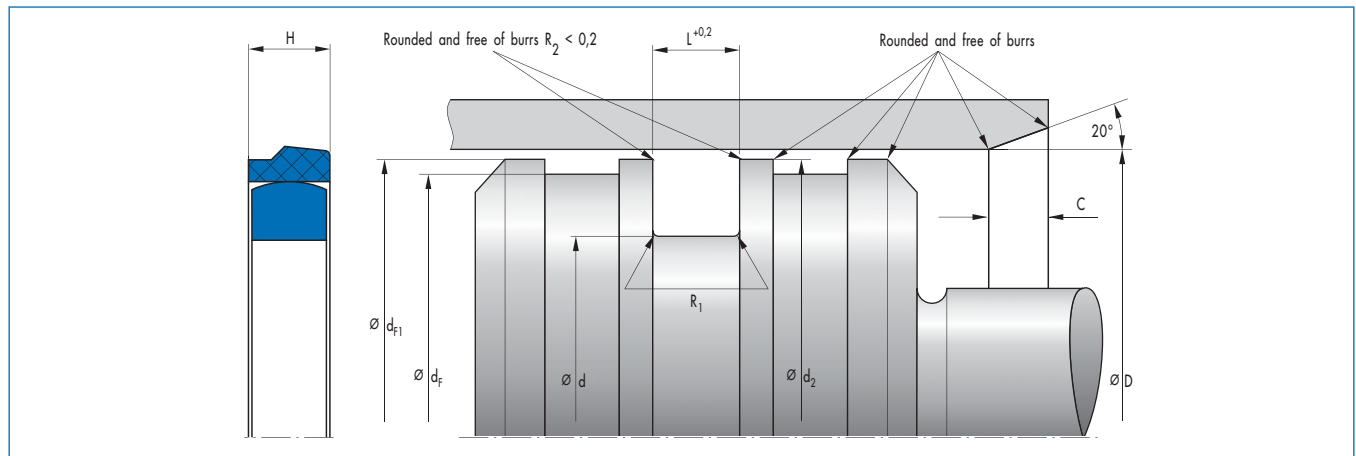
16 MPa			26 MPa			32 MPa			40 MPa		
Nominal Ø D	D	d	Nominal Ø D	D	d	Nominal Ø D	D	d	Nominal Ø D	D	d
100 ... 500	H8	h8	100 ... 500	H8	h8	100 ... 500	H8	h8	100 ... 500	H8	h8
>500 ... 1000	H8	h8	>500 ... 1000	H8	h8	>500 ... 1000	H8	h8	>500 ... 1000	H7	h7

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



D	d	H	L	Profile	C	R ₁	Material	Article No.	
110	90	9,4	10	10	7,5	0,4	PTFE GM201	24351403	○
120	100	9,4	10	10	7,5	0,4	PTFE GM201	24380258	○
125	105	9,4	10	10	7,5	0,4	PTFE GM201	24351404	○
125	105	9,4	10	10	7,5	0,4	PTFE B602	49000473	○
130	110	9,4	10	10	7,5	0,4	PTFE GM201	531548	○
140	120	9,4	10	10	7,5	0,4	PTFE GM201	24351116	○
160	135	11,7	12,5	12,5	10	0,4	PTFE GM201	24351168	○
170	145	11,7	12,5	12,5	10	0,4	PTFE GM201	526064	○
170	145	11,7	12,5	12,5	10	0,4	PTFE B602	24339183	○
180	155	11,7	12,5	12,5	10	0,4	PTFE B602	24298561	○
200	175	11,7	12,5	12,5	10	0,4	PTFE GM201	24380283	○
210	185	11,7	12,5	12,5	10	0,4	PTFE GM201	24351170	○
260	230	14	15	15	12	0,8	PTFE GM201	24227066	○
260	230	14	15	15	12	0,8	PTFE B602	24378105	○
280	250	14	15	15	12	0,8	PTFE GM201	24265687	○
280	250	14	15	15	12	0,8	PTFE B602	24339180	○
300	270	14	15	15	12	0,8	PTFE GM201	24209307	○
300	270	14	15	15	12	0,8	PTFE B602	24339181	●
320	290	14	15	15	12	0,8	PTFE GM201	24265690	○
320	290	14	15	15	12	0,8	PTFE B602	24339182	○
330	300	14	15	15	12	0,8	PTFE B602	24339186	○
340	310	14	15	15	12	0,8	PTFE B602	24353070	○
350	320	14	15	15	12	0,8	PTFE GM201	24248305	○
380	350	14	15	15	12	0,8	PTFE GM201	526957	○
410	375	16,4	17,5	17,5	12	1,2	PTFE GM201	24213829	○
500	465	16,4	17,5	17,5	12	1,2	PTFE B602	24346901	○
500	465	16,4	17,5	17,5	12	1,2	PTFE GM201	49013401	○
520	485	16,4	17,5	17,5	12	1,2	PTFE GM201	24357903	○
550	515	16,4	17,5	17,5	12	1,2	PTFE GM201	24372694	○
600	565	16,4	17,5	17,5	12	1,2	PTFE B602	24338042	○
620	585	16,4	17,5	17,5	12	1,2	PTFE GM201	530238	○
660	625	16,4	17,5	17,5	12	1,2	PTFE B602	24291575	○
720	685	16,4	17,5	17,5	12	1,2	PTFE GM201	24213578	○
740	705	16,4	17,5	17,5	12	1,2	PTFE GM201	24378497	○
750	710	18,7	20	20	12	1,2	PTFE GM201	49011384	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Omegat OMK-MR

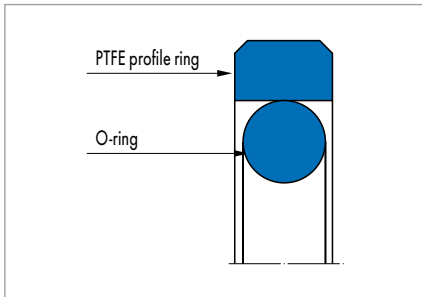


Fig. 1 Merkel Omegat OMK-MR

Product description

Two-piece Merkel seal set for sealing pistons, consisting of one PTFE profile ring and an O-ring as a pre-load component.

Product advantages

Merkel Omegat OMK-MR is used where a piston has pressure on both sides. OMK-MR is provided with pressure-compensation grooves for rapid pressure change

- Very high resistance to pressure and hardness
- Good thermal conductivity
- Very good protection against extrusion
- High resistance to abrasion
- Low friction, free of stick-slip.

Application

Presses, agricultural machinery, injection moulding machines, mills, marine hydraulics, industrial vehicles, cranes, handling equipment, control and regulation equipment.

Material

PTFE profile ring

Material	Code
PTFE bronze compound	PTFE B602
PTFE glass MoS ₂ compound	PTFE GM201

O-ring

Material	Code	Hardness
NBR	70 NBR B276	70 Shore A
FKM	70 FKM K655	70 Shore A

Operating conditions

Material	Temperature range in °C		
	PTFE B602/ 70 NBR B276	PTFE B602/ 70 NBR B276	PTFE B602/ 70 FKM K655
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +100	-10 ... +200
HFA fluids	-	-	-
HFB fluids	-	-	-
HFC fluids	-	-	-
HFD fluids	-	-	-10 ... +200
Water	-	-	-
HETG (rapeseed oil)	-30 ... +80	-30 ... +80	-10 ... +80
HEES (synthetic esters)	-30 ... +80	-30 ... +80	-10 ... +100
HEPG (glycol)	-30 ... +60	-30 ... +60	-10 ... +80
Mineral greases	-30 ... +100	-30 ... +100	-10 ... +200
Pressure p in MPa	40		
Running speed v in m/s	5		

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 μm	≤2,5 μm
Groove base	≤1,6 μm	≤6,3 μm
Groove flanks	≤3,0 μm	≤15,0 μm

Percentage contact area M_c >50% up to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Profile		Max. permissible gap dimension			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
2,2	2,45	0,35	0,30	-	-
3,2	3,75	0,40	0,35	-	-
4,2	5,50	0,50	0,40	0,30	-
6,3	7,75	0,55	0,45	0,40	0,35
8,1	10,50	0,60	0,50	0,45	0,45
8,1	12,25	0,70	0,60	0,55	0,50
9,5	14,00	0,75	0,65	0,60	0,50

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

Tolerance recommendations – for non-metallic guides

Nominal Ø D	Profile	16 MPa		26 MPa		32 MPa		40 MPa	
		D	d	D	d	D	d	D	d
<40	2,45 ... 3,75	H8	h9	H8	h9	-	-	-	-
<100	5,50	H8	h8	H8	h8	H8	h8	-	-
<500	7,75 ... 12,25	H8	h8	H8	h8	H8	h8	H8	h8
<660	12,25	H8	h7	H8	h7	H8	h7	H7	h7
<1100	12,25 ... 14,0	H8	h7	H8	h7	H7	h7	H7	h7

Regard must be paid to the dimensions d1 and dF in connection with the guide element used.

Material selection table

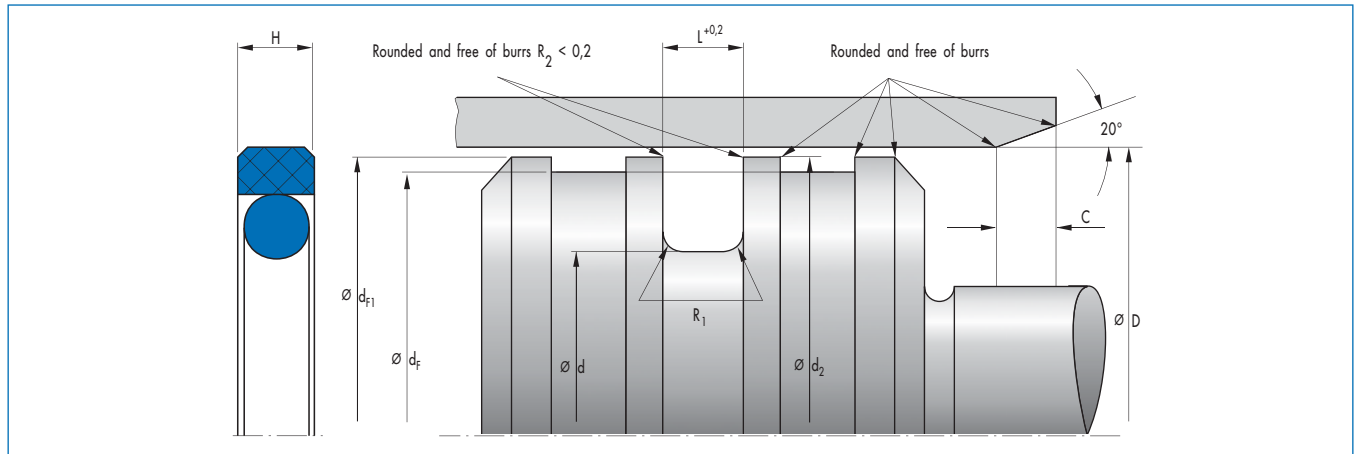
	PTFE M201/ 70 NBR B276 (PTFE Glass-MoS ₂ / NBR)	PTFE B602/ 70 NBR B276 (PTFE bronze/ NBR)	PTFE B602/ 70 FKM K655 (PTFE bronze/ FKM)
Oil hydraulics -30 ... +100 °C	●	●	○
Oil hydraulics -10 ... +200 °C	○	○	●
Short stroke, high frequency	●	○	○
Water hydraulics	●	○	○
Soft counterface	●	○	○

● = suitable; ◐ = possible; ○ = not suitable

Fitting & installation

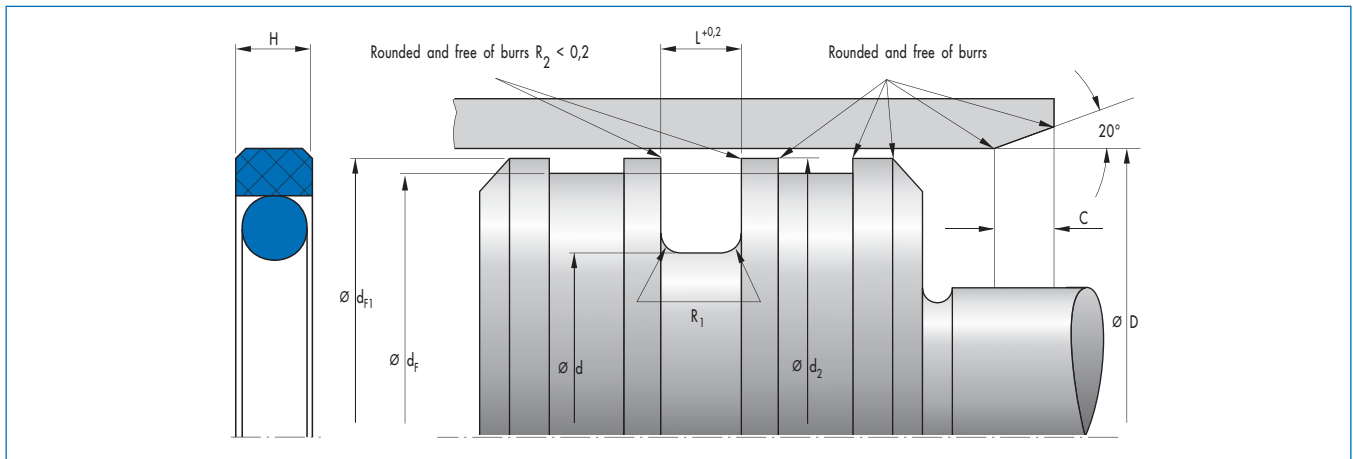
Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



D	d	H	L	Profile	C	R ₁	Material	Article No.	
8	3,1	2	2,2	2,45	3	0,3	PTFE GM201 / NBR	24213518	○
8	3,1	2	2,2	2,45	3	0,3	PTFE B602 / NBR	24213753	○
8	3,1	2	2,2	2,45	3	0,3	PTFE B602 / FKM	24348353	○
10	5,1	2	2,2	2,45	3	0,3	PTFE GM201 / NBR	24213519	○
10	5,1	2	2,2	2,45	3	0,3	PTFE B602 / NBR	24213755	●
10	5,1	2	2,2	2,45	3	0,3	PTFE B602 / FKM	24330049	○
12	7,1	2	2,2	2,45	3	0,3	PTFE GM201 / NBR	24213520	○
12	7,1	2	2,2	2,45	3	0,3	PTFE B602 / NBR	24213757	●
12	7,1	2	2,2	2,45	3	0,3	PTFE B602 / FKM	24237996	○
15	7,5	3	3,2	3,75	4,5	0,5	PTFE GM201 / NBR	24213521	○
15	7,5	3	3,2	3,75	4,5	0,5	PTFE B602 / NBR	24213759	●
15	7,5	3	3,2	3,75	4,5	0,5	PTFE B602 / FKM	24348843	○
16	8,5	3	3,2	3,75	4,5	0,5	PTFE GM201 / NBR	24208135	○
16	8,5	3	3,2	3,75	4,5	0,5	PTFE B602 / NBR	24213761	●
16	8,5	3	3,2	3,75	4,5	0,5	PTFE B602 / FKM	24260916	○
18	10,5	3	3,2	3,75	4,5	0,5	PTFE GM201 / NBR	24213522	●
18	10,5	3	3,2	3,75	4,5	0,5	PTFE B602 / NBR	24213763	●
18	10,5	3	3,2	3,75	4,5	0,5	PTFE B602 / FKM	24348354	○
20	12,5	3	3,2	3,75	4,5	0,5	PTFE GM201 / NBR	24131850	●
20	12,5	3	3,2	3,75	4,5	0,5	PTFE B602 / NBR	24178456	●
20	12,5	3	3,2	3,75	4,5	0,5	PTFE B602 / FKM	24348355	○
22	14,5	3	3,2	3,75	4,5	0,5	PTFE GM201 / NBR	24131851	●
22	14,5	3	3,2	3,75	4,5	0,5	PTFE B602 / NBR	24178457	●
22	14,5	3	3,2	3,75	4,5	0,5	PTFE B602 / FKM	24257623	○
25	17,5	3	3,2	3,75	4,5	0,5	PTFE GM201 / NBR	24131852	●
25	17,5	3	3,2	3,75	4,5	0,5	PTFE B602 / NBR	24178458	●
25	17,5	3	3,2	3,75	4,5	0,5	PTFE B602 / FKM	24258030	○
28	20,5	3	3,2	3,75	4,5	0,5	PTFE GM201 / NBR	24131853	●
28	20,5	3	3,2	3,75	4,5	0,5	PTFE B602 / NBR	24178459	●
28	20,5	3	3,2	3,75	4,5	0,5	PTFE B602 / FKM	24348377	○
30	22,5	3	3,2	3,75	4,5	0,5	PTFE GM201 / NBR	24131854	●
30	22,5	3	3,2	3,75	4,5	0,5	PTFE B602 / NBR	24178460	●
30	22,5	3	3,2	3,75	4,5	0,5	PTFE B602 / FKM	24300913	○
32	24,5	3	3,2	3,75	4,5	0,5	PTFE GM201 / NBR	24102892	●
32	24,5	3	3,2	3,75	4,5	0,5	PTFE B602 / NBR	24178461	●

● Available from stock ○ On request: Tool is available, delivery at short notice

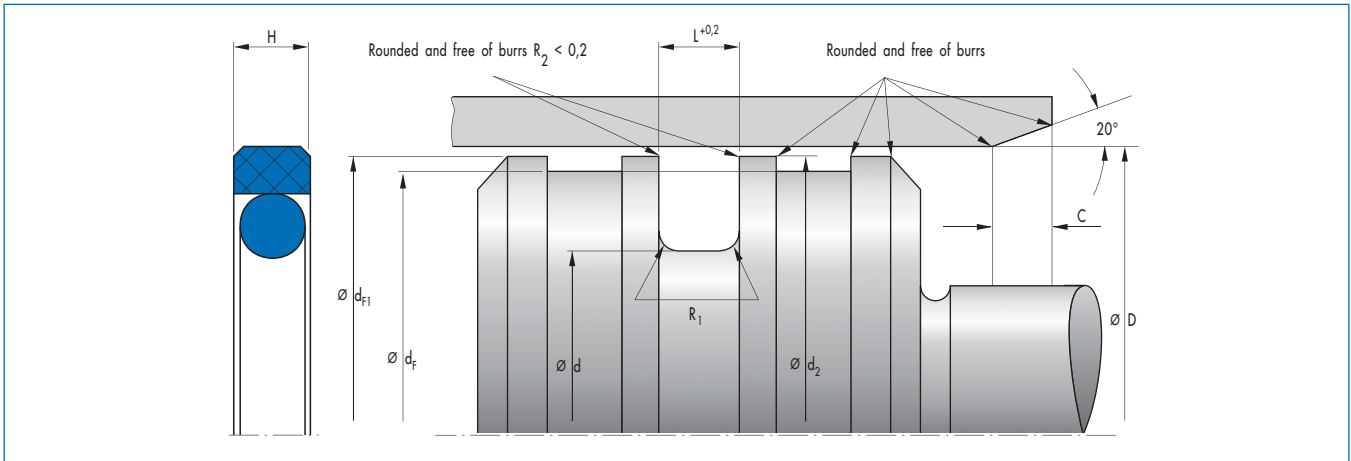


D	d	H	L	Profile	C	R ₁	Material	Article No.	
32	24,5	3	3,2	3,75	4,5	0,5	PTFE B602 / FKM	24257477	○
35	27,5	3	3,2	3,75	4,5	0,5	PTFE GM201 / NBR	24106354	●
35	27,5	3	3,2	3,75	4,5	0,5	PTFE B602 / NBR	24178462	●
35	27,5	3	3,2	3,75	4,5	0,5	PTFE B602 / FKM	24300835	○
36	28,5	3	3,2	3,75	4,5	0,5	PTFE GM201 / NBR	24131855	○
36	28,5	3	3,2	3,75	4,5	0,5	PTFE B602 / NBR	24178463	●
36	28,5	3	3,2	3,75	4,5	0,5	PTFE B602 / FKM	24348357	○
40	29	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24106357	●
40	29	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24178464	●
40	29	4	4,2	5,5	6	0,8	PTFE B602 / FKM	24260917	●
42	31	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24131856	●
42	31	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24178465	●
42	31	4	4,2	5,5	6	0,8	PTFE B602 / FKM	24306482	○
45	34	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24108643	●
45	34	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24178466	●
45	34	4	4,2	5,5	6	0,8	PTFE B602 / FKM	24348358	●
50	39	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24109476	●
50	39	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24178467	●
50	39	4	4,2	5,5	6	0,8	PTFE B602 / FKM	24246484	●
55	44	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24131857	●
55	44	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24178468	●
55	44	4	4,2	5,5	6	0,8	PTFE B602 / FKM	24260918	○
56	45	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24131858	○
56	45	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24178469	●
60	49	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24131859	●
60	49	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24178470	●
60	49	4	4,2	5,5	6	0,8	PTFE B602 / FKM	24288831	○
63	52	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24123140	●
63	52	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24178471	●
63	52	4	4,2	5,5	6	0,8	PTFE B602 / FKM	24263382	○
65	54	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24104068	●
65	54	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24191950	●
65	54	4	4,2	5,5	6	0,8	PTFE B602 / FKM	24348360	○
70	54,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24131887	●
70	54,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24213778	●
70	54,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24332341	○
70	59	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24131860	●

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	L	Profile	C	R ₁	Material	Article No.	
70	59	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24213776	●
70	59	4	4,2	5,5	6	0,8	PTFE B602 / FKM	24348379	●
75	59,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24213523	●
75	59,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24213782	●
75	59,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24348378	○
75	64	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24145486	○
75	64	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24213780	●
75	64	4	4,2	5,5	6	0,8	PTFE B602 / FKM	24348361	○
80	59	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24131888	●
80	59	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24213784	●
80	64,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24101263	●
80	64,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24178473	●
80	64,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24258031	●
85	64	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24213524	○
85	64	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24213786	●
85	64	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348842	○
85	69,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24213788	●
85	69,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24223623	○
85	69,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24348873	○
90	69	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24131889	●
90	69	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24213790	●
90	69	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348872	○
90	74,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24131861	●
90	74,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24178474	●
90	74,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24315179	●
95	74	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24075603	○
95	74	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24213792	○
95	74	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348837	○
95	79,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24199482	○
95	79,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24266812	○
95	79,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24213794	●
100	79	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24077512	●
100	79	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24213796	●
100	79	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348838	○
100	84,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24107904	●
100	84,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24178475	●
100	84,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24257247	●
100	89	4	4,2	5,5	6	0,8	PTFE B602 / NBR	24259017	○
100	89	4	4,2	5,5	6	0,8	PTFE GM201 / NBR	24328829	○
105	89,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24187281	○
105	89,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24213798	●
105	89,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24348381	○
110	89	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24077514	○
110	89	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24213802	●
110	89	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348380	○
110	94,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24131862	●
110	94,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24178476	●
110	94,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24337969	○
115	94	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24131890	○
115	94	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24193795	●

● Available from stock ○ On request: Tool is available, delivery at short notice

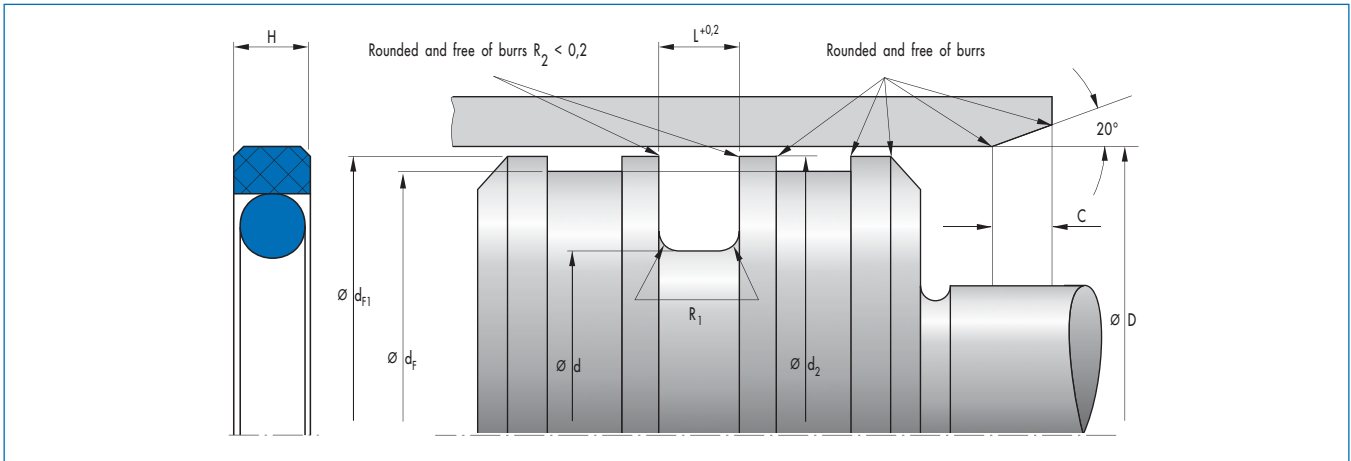


D	d	H	L	Profile	C	R ₁	Material	Article No.	
115	94	7,7	8,1	10,5	10,5	2	PTFE B602 / O	24348874	○
115	99,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24131863	●
115	99,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24178477	●
115	99,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24348382	○
120	99	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24199999	○
120	99	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24213807	●
120	99	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348875	○
120	104,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24186464	●
120	104,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24213805	●
120	104,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24348383	○
125	104	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24093346	●
125	104	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24213809	●
125	104	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24340950	○
125	109,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24109478	●
125	109,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24178478	●
125	109,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24245799	●
130	109	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24077517	○
130	109	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24213811	●
130	109	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348365	○
130	114,5	5,9	6,3	7,75	8	1,2	PTFE GM201 / NBR	24145852	○
130	114,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24213813	●
130	114,5	5,9	6,3	7,75	8	1,2	PTFE B602 / FKM	24348366	○
133,4	117,7	5,7	6,3	7,85	8	1,2	PTFE B602 / FKM	24375986	○
140	119	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24075607	●
140	119	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24178479	●
140	119	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24236496	●
150	129	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24075609	●
150	129	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24178480	●
150	129	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24340951	○
152,4	131,3	7,6	8,1	10,55	10,5	2	PTFE B602 / FKM	24375985	○
160	139	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24075673	●
160	139	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24267553	●
160	139	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24213816	●
170	149	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24131864	●
170	149	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24179245	●
170	149	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24340954	○
175	159,5	5,9	6,3	7,75	8	1,2	PTFE B602 / NBR	24361027	●

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	L	Profile	C	R ₁	Material	Article No.	
180	159	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24131865	●
180	159	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24179246	●
180	159	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24288832	●
185	164	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24231189	●
190	169	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24131866	●
190	169	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24179247	●
190	169	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348369	○
200	179	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24131867	●
200	179	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24179248	●
200	179	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24306875	●
210	189	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24138658	○
210	189	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24236852	●
210	189	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348384	○
220	199	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24131868	●
220	199	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24315138	●
220	199	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24179249	●
225	204	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24137322	○
225	204	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24288833	●
230	209	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24145853	●
230	209	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24275475	●
230	209	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348385	○
240	219	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24107902	○
240	219	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24191703	●
240	219	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348370	○
250	229	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24131869	●
250	229	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24179250	●
250	229	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24288709	●
260	239	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24192188	●
260	239	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24223625	○
260	239	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348386	○
270	249	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24121481	○
270	249	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24191949	○
270	249	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24258180	○
280	259	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24120265	●
280	259	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24179251	●
280	259	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24340952	○
290	269	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24275526	○
290	269	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24275640	○
290	269	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348372	○
300	279	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24179922	○
300	279	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24213824	●
300	279	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24266419	○
310	289	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24248946	○
310	289	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24251064	●
310	289	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24348840	○
320	299	7,7	8,1	10,5	10,5	2	PTFE GM201 / NBR	24131870	○
320	299	7,7	8,1	10,5	10,5	2	PTFE B602 / NBR	24179252	●
320	299	7,7	8,1	10,5	10,5	2	PTFE B602 / FKM	24288835	●
330	305,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24105259	●
330	305,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275529	●

● Available from stock ○ On request: Tool is available, delivery at short notice

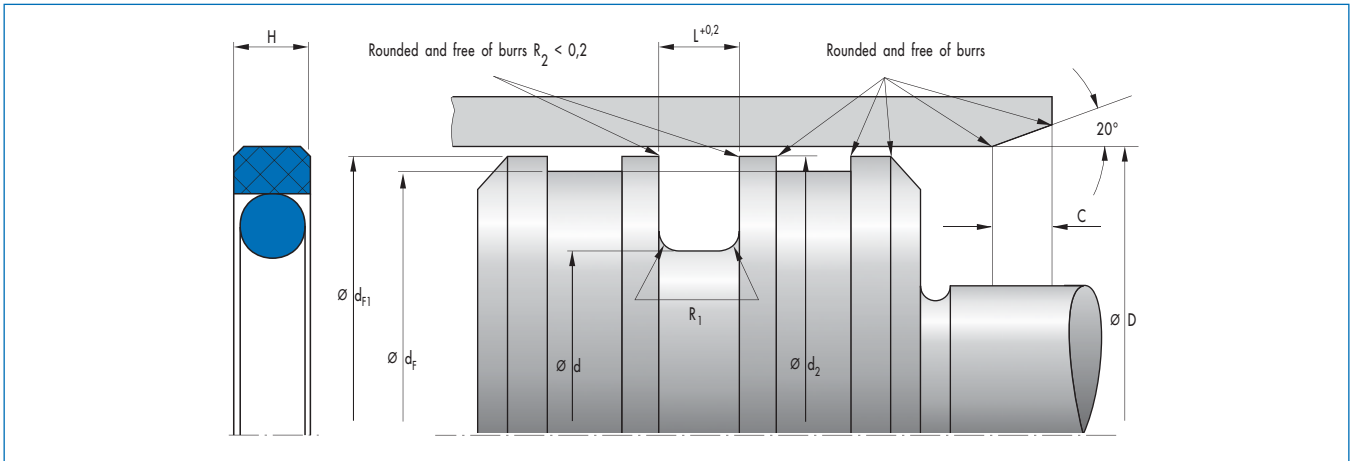


D	d	H	L	Profile	C	R ₁	Material	Article No.	
330	305,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24348373	○
340	315,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24213529	○
340	315,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24213827	●
340	315,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24348374	●
350	325,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24199746	○
350	325,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275527	●
350	325,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24328250	○
360	335,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24118300	●
360	335,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24179253	●
360	335,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24333319	○
370	345,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24251062	●
370	345,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275649	○
370	345,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24348375	○
380	355,5	7,7	8,1	12	14	2	PTFE GM201 / NBR	24194142	○
380	355,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275530	●
380	355,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24311133	○
390	365,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24145902	●
390	365,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275528	○
390	365,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24348309	○
400	375,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24123281	●
400	375,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24179254	●
400	375,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24340953	○
410	385,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24145195	○
410	385,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275480	●
410	385,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349353	○
420	395,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24234537	●
420	395,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24240756	○
420	395,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24344111	○
430	405,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24274578	●
430	405,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275683	○
430	405,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349354	○
440	415,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24194521	○
440	415,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275478	●
440	415,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349355	○
450	425,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24269426	●
450	425,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275678	○
450	425,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349356	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	L	Profile	C	R ₁	Material	Article No.	
460	435,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24174791	○
460	435,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24259026	●
460	435,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349357	○
470	445,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275477	○
470	445,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275646	○
470	445,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349358	○
480	455,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24194143	○
480	455,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275483	●
480	455,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349359	○
490	465,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275479	○
490	465,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275481	○
490	465,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24328252	○
490,5	515	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24344662	○
500	475,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24268694	●
500	475,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24268696	○
500	475,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349360	○
510	485,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275482	○
510	485,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275681	○
520	495,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24269669	●
520	495,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275655	○
520	495,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24327515	○
530	505,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275489	●
530	505,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275659	○
530	505,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349362	○
540	515,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275492	●
540	515,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275684	○
540	515,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349363	○
550	525,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275494	○
550	525,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275665	○
550	525,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349364	○
560	535,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275490	●
560	535,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275667	○
560	535,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349365	○
570	545,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275476	○
570	545,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275486	○
570	545,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349366	○
580	555,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275493	●
580	555,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275661	○
580	555,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349367	○
590	565,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275497	○
590	565,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275666	○
590	565,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349368	○
600	575,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24145899	○
600	575,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24191702	●
600	575,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349370	○
610	585,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24233565	○
610	585,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24234535	○
610	585,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349371	○
620	595,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275487	○
620	595,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275675	○

● Available from stock ○ On request: Tool is available, delivery at short notice

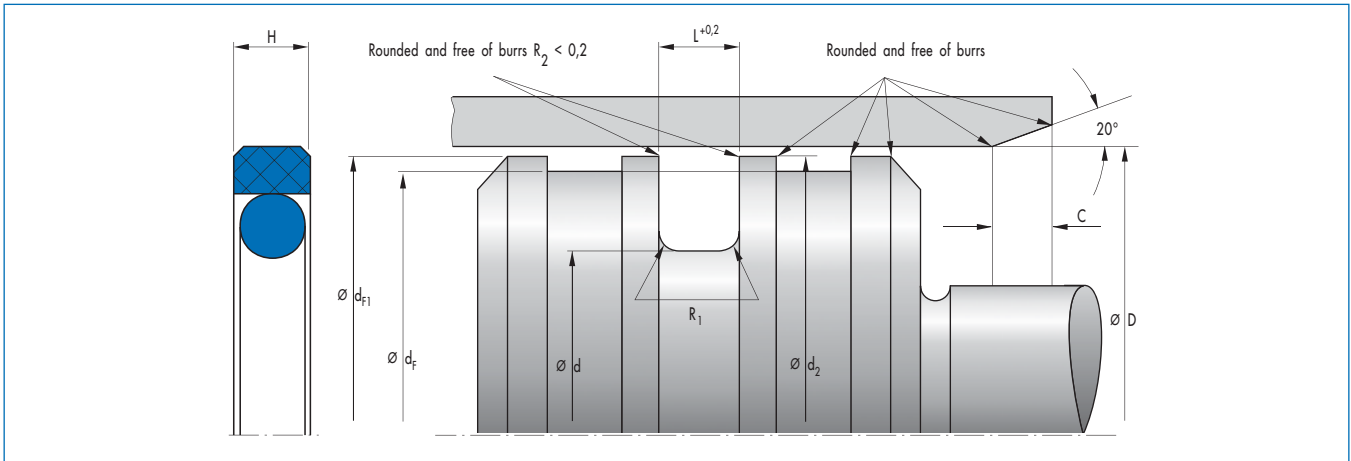


D	d	H	L	Profile	C	R ₁	Material	Article No.	
620	595,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24316069	○
630	605,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275498	●
630	605,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275647	○
630	605,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24347059	○
640	615,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24243559	○
640	615,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275668	○
640	615,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349372	○
650	625,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24268698	●
650	625,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24268700	○
650	625,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349373	○
660	635,5	7,7	8,1	12,25	12	2	PTFE B602 / NBR	24275495	○
660	635,5	7,7	8,1	12,25	12	2	PTFE GM201 / NBR	24275637	○
660	635,5	7,7	8,1	12,25	12	2	PTFE B602 / FKM	24349374	○
670	642	9	9,5	14	13	2	PTFE B602 / NBR	24275502	○
670	642	9	9,5	14	13	2	PTFE GM201 / NBR	24275660	○
670	642	9	9,5	14	13	2	PTFE B602 / FKM	24349458	○
680	652	9	9,5	14	13	2	PTFE B602 / NBR	24275499	○
680	652	9	9,5	14	13	2	PTFE GM201 / NBR	24275682	○
680	652	9	9,5	14	13	2	PTFE B602 / FKM	24349459	○
690	662	8,7	9,5	14	13	2	PTFE B602 / NBR	24275501	○
690	662	9	9,5	14	13	2	PTFE GM201 / NBR	24275676	○
690	662	9	9,5	14	13	2	PTFE B602 / FKM	24349460	○
700	672	9	9,5	14	13	2	PTFE B602 / NBR	24268832	●
700	672	9	9,5	14	13	2	PTFE GM201 / NBR	24268834	○
700	672	9	9,5	14	13	2	PTFE B602 / FKM	24349461	○
710	682	9	9,5	14	13	2	PTFE B602 / NBR	24275488	●
710	682	9	9,5	14	13	2	PTFE GM201 / NBR	24275674	○
710	682	9	9,5	14	13	2	PTFE B602 / FKM	24349462	○
720	692	9	9,5	14	13	2	PTFE B602 / NBR	24275500	●
720	692	9	9,5	14	13	2	PTFE GM201 / NBR	24275650	○
720	692	9	9,5	14	13	2	PTFE B602 / FKM	24349463	○
730	702	9	9,5	14	13	2	PTFE B602 / NBR	24269480	○
730	702	9	9,5	14	13	2	PTFE GM201 / NBR	24275671	○
730	702	9	9,5	14	13	2	PTFE B602 / FKM	24349464	○
740	712	9	9,5	14	13	2	PTFE B602 / NBR	24275510	○
740	712	9	9,5	14	13	2	PTFE GM201 / NBR	24275664	○
740	712	9	9,5	14	13	2	PTFE B602 / FKM	24349465	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	L	Profile	C	R ₁	Material	Article No.	
750	722	9	9,5	14	13	2	PTFE B602 / NBR	24275514	○
750	722	9	9,5	14	13	2	PTFE GM201 / NBR	24275663	○
750	722	9	9,5	14	13	2	PTFE B602 / FKM	24349466	○
760	732	9	9,5	14	13	2	PTFE B602 / NBR	24275508	○
760	732	9	9,5	14	13	2	PTFE GM201 / NBR	24275679	○
760	732	9	9,5	14	13	2	PTFE B602 / FKM	24349467	○
770	742	9	9,5	14	13	2	PTFE B602 / NBR	24275503	○
770	742	9	9,5	14	13	2	PTFE GM201 / NBR	24275644	○
770	742	9	9,5	14	13	2	PTFE B602 / FKM	24349468	○
777	805	9	9,5	14	13	2	PTFE B602 / NBR	24344664	○
780	752	9	9,5	14	13	2	PTFE B602 / NBR	24275512	○
780	752	9	9,5	14	13	2	PTFE GM201 / NBR	24275662	○
780	752	9	9,5	14	13	2	PTFE B602 / FKM	24349469	○
790	762	9	9,5	14	13	2	PTFE B602 / NBR	24275517	○
790	762	9	9,5	14	13	2	PTFE GM201 / NBR	24275658	○
790	762	9	9,5	14	13	2	PTFE B602 / FKM	24349472	○
800	772	9	9,5	14	13	2	PTFE B602 / NBR	24275523	●
800	772	9	9,5	14	13	2	PTFE GM201 / NBR	24275645	○
800	772	9	9,5	14	13	2	PTFE B602 / FKM	24349473	○
810	782	9	9,5	14	13	2	PTFE B602 / NBR	24275513	○
810	782	9	9,5	14	13	2	PTFE GM201 / NBR	24275670	○
820	792	9	9,5	14	13	2	PTFE B602 / NBR	24275504	○
820	792	9	9,5	14	13	2	PTFE GM201 / NBR	24275685	○
830	802	9	9,5	14	13	2	PTFE B602 / NBR	24275518	○
830	802	9	9,5	14	13	2	PTFE GM201 / NBR	24275673	○
830	802	9	9,5	14	13	2	PTFE B602 / FKM	24349476	○
840	812	9	9,5	14	13	2	PTFE B602 / NBR	24275511	○
840	812	9	9,5	14	13	2	PTFE GM201 / NBR	24275687	○
840	812	9	9,5	14	13	2	PTFE B602 / FKM	24349477	○
850	822	9	9,5	14	13	2	PTFE B602 / NBR	24275507	○
850	822	9	9,5	14	13	2	PTFE GM201 / NBR	24275652	○
850	822	9	9,5	14	13	2	PTFE B602 / FKM	24349478	○
860	832	9	9,5	14	13	2	PTFE B602 / NBR	24275515	○
860	832	9	9,5	14	13	2	PTFE GM201 / NBR	24275648	○
860	832	9	9,5	14	13	2	PTFE B602 / FKM	24349479	○
865	837	9	9,5	14	13	2	PTFE B602 / FKM	24353417	○
865	837	9	9,5	14	13	2	PTFE B602 / NBR	24353783	○
870	842	9	9,5	14	13	2	PTFE B602 / NBR	24275522	○
870	842	9	9,5	14	13	2	PTFE GM201 / NBR	24275651	○
870	842	9	9,5	14	13	2	PTFE B602 / FKM	24349480	○
880	852	9	9,5	14	13	2	PTFE B602 / NBR	24275519	○
880	852	9	9,5	14	13	2	PTFE GM201 / NBR	24275657	○
880	852	9	9,5	14	13	2	PTFE B602 / FKM	24349481	○
890	862	9	9,5	14	13	2	PTFE B602 / NBR	24275509	○
890	862	9	9,5	14	13	2	PTFE B602 / FKM	24349482	○
900	872	9	9,5	14	13	2	PTFE B602 / NBR	24275521	○
900	872	9	9,5	14	13	2	PTFE GM201 / NBR	24275677	○
900	872	9	9,5	14	13	2	PTFE B602 / FKM	24349483	○
910	882	9	9,5	14	13	2	PTFE B602 / NBR	24275516	○
910	882	9	9,5	14	13	2	PTFE GM201 / NBR	24275672	○

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d	H	L	Profile	C	R ₁	Material	Article No.	
910	882	9	9,5	14	13	2	PTFE B602 / FKM	24349484	○
920	892	9	9,5	14	13	2	PTFE B602 / NBR	24269457	○
920	892	9	9,5	14	13	2	PTFE GM201 / NBR	24275680	○
920	892	9	9,5	14	13	2	PTFE B602 / FKM	24349485	○
930	902	9	9,5	14	13	2	PTFE B602 / NBR	24275520	○
930	902	9	9,5	14	13	2	PTFE GM201 / NBR	24275653	○
930	902	9	9,5	14	13	2	PTFE B602 / FKM	24349486	○
940	912	9	9,5	14	13	2	PTFE B602 / NBR	24275524	○
940	912	9	9,5	14	13	2	PTFE GM201 / NBR	24275686	○
940	912	9	9,5	14	13	2	PTFE B602 / FKM	24349487	○
950	922	9	9,5	14	13	2	PTFE B670 / NBR	24275525	○
950	922	9	9,5	14	13	2	PTFE GM201 / NBR	24275638	○
950	922	9	9,5	14	13	2	PTFE B670 / FKM	24349488	○
965	937	9	9,5	14	13	2	PTFE B670 / NBR	24295220	●
1100	1072	9	9,5	14	13	2	PTFE GM201 / NBR	24345602	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Omegat OMK-S

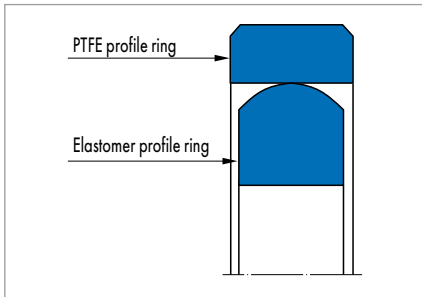


Fig. 1 Merkel Omegat OMK-S

Product description

Two-piece Merkel seal set for sealing pistons consisting of one PTFE profile ring and one elastomer profile ring as a pre-load component. The seal set is designed for heavy duty hydraulic applications.

Product advantages

The Merkel Omegat OMK-S can be used where a piston has pressure on both sides and is designed especially for large diameters

- Very high resistance to pressure
- Design prevents twisting
- Very good protection against extrusion
- High resistance to abrasion
- Good thermal conductivity
- Low friction, free of stick-slip
- High contact pressure due to elastomer profile ring.

Application

Injection moulding machines, manipulators, mills, steel hydraulics engineering, marine hydraulics, presses, large cylinders.

Material

PTFE profile ring

Material	Code
PTFE bronze compound	PTFE B602
PTFE glass MoS ₂ compound	PTFE GM201

Elastomer profile ring

Material	Code	Hardness
Nitrile rubber NBR	80 NBR B246	80 Shore A

Operating conditions

Material	PTFE B602/ 70 NBR B246	PTFE GM201/ 80 NBR B246
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +100
HFA fluids	-	+5 ... +60
HFB fluids	-	+5 ... +60
HFC fluids	-	-30 ... +60
HFD fluids	-	-
Water	-	+5 ... +100
HETG (rapeseed oil)	-30 ... +80	-30 ... +80
HEES (synthetic esters)	-30 ... +80	-30 ... +80
HEPG (glycol)	-30 ... +60	-30 ... +60
Mineral greases	-30 ... +100	-30 ... +100
Pressure p in MPa	40	
Running speed v in m/s	5	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 μm	≤2,5 μm
Groove base	≤1,6 μm	≤6,3 μm
Groove flanks	≤3,0 μm	≤15,0 μm

Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Profile		Max. permissible gap dimension			
L	Profile	16 MPa	26 MPa	32 MPa	40 MPa
10,0	10,0	0,60	0,50	0,40	0,40
12,5	12,5	0,75	0,65	0,55	0,50
15,0	15,0	0,75	0,65	0,55	0,50
17,5	17,5	0,75	0,65	0,55	0,50
20,0	20,0	0,80	0,70	0,60	0,55

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

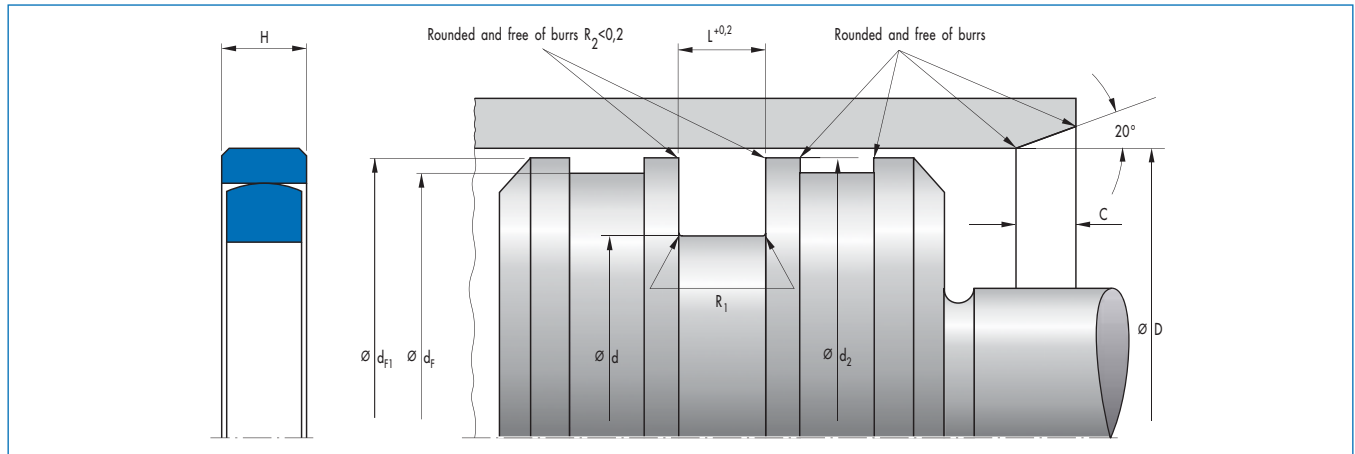
Tolerance recommendations – for non-metallic guides

16 MPa			26 MPa			32 MPa			40 MPa		
Nominal Ø D	D	d	Nominal Ø D	D	d	Nominal Ø D	D	d	Nominal Ø D	D	d
100 ... 500	H8	h8	100 ... 500	H8	h8	100 ... 500	H8	h8	100 ... 500	H8	h8
>500 ... 1000	H8	h8	>500 ... 1000	H8	h8	>500 ... 1000	H8	h8	>500 ... 1000	H7	h7

Fitting & installation

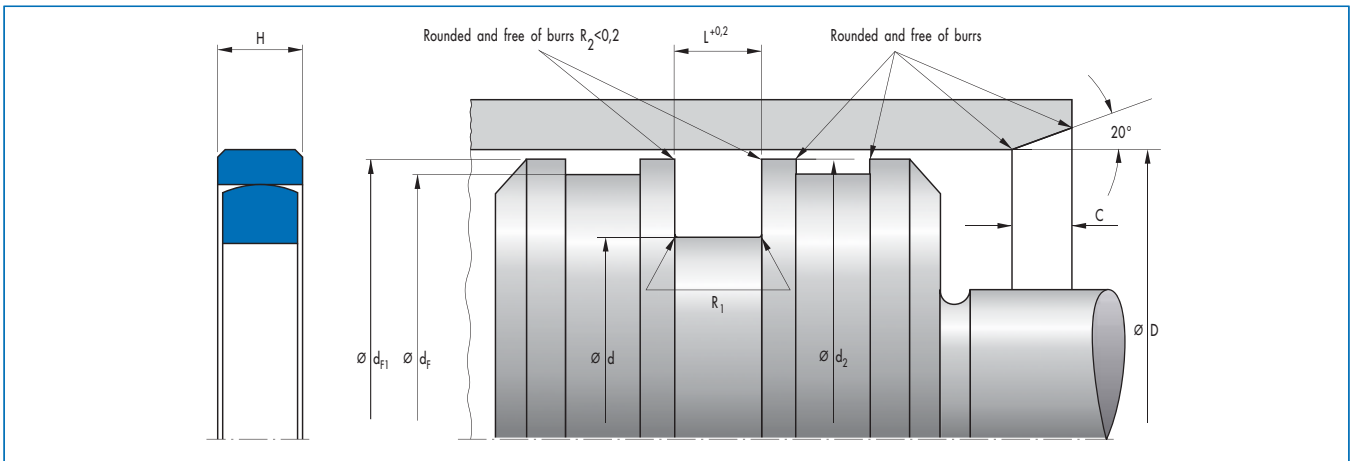
Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



D	d	H	L	Profile	C	R ₁	Material	Article No.	
55	40	7,2	10	7,5	7,5	0,4	PTFE GM201	24096097	○
60	45	7,2	10	7,5	7,5	0,4	PTFE GM201	24096100	○
70	55	7,2	10	7,5	7,5	0,4	PTFE GM201	24096102	○
80	60	9,6	10	10	7,5	0,4	PTFE GM201	24096103	●
90	70	9,6	10	10	7,5	0,4	PTFE GM201	24360341	○
100	80	9,6	10	10	7,5	0,4	PTFE GM201	24096105	●
110	90	9,6	10	10	7,5	0,4	PTFE GM201	24371157	○
115	95	9,6	10	10	7,5	0,4	PTFE GM201	24096107	●
120	100	9,6	10	10	7,5	0,4	PTFE GM201	24088300	○
125	105	9,6	10	10	7,5	0,4	PTFE GM201	24096108	●
130	110	9,6	10	10	7,5	0,4	PTFE GM201	24090826	○
140	120	9,6	10	10	7,5	0,4	PTFE GM201	24096109	●
140	120	9,6	10	10	7,5	0,4	PTFE GM201	24353223	○
150	125	12,1	12,5	12,5	10	0,4	PTFE GM201	24090827	●
160	135	12,1	12,5	12,5	10	0,4	PTFE GM201	24096110	○
165	140	12,1	12,5	12,5	10	0,4	PTFE GM201	24237355	○
170	145	12,1	12,5	12,5	10	0,4	PTFE GM201	24090828	○
180	155	12,1	12,5	12,5	10	0,4	PTFE GM201	24083159	●
185	160	12,1	12,5	12,5	10	0,4	PTFE GM201	24237361	○
190	165	12,1	12,5	12,5	10	0,4	PTFE GM201	24096111	○
200	175	12,1	12,5	12,5	10	0,4	PTFE GM201	24096112	●
205	180	12,1	12,5	12,5	10	0,4	PTFE GM201	24263860	○
210	185	12,1	12,5	12,5	10	0,4	PTFE GM201	24142938	●
215	190	12,1	12,5	12,5	10	0,4	PTFE GM201	24240809	○
220	195	12,1	12,5	12,5	10	0,4	PTFE GM201	24096113	●
225	200	12,1	12,5	12,5	10	0,4	PTFE GM201	49000416	○
230	205	12,1	12,5	12,5	10	0,4	PTFE GM201	24224701	○
235	210	12,1	12,5	12,5	10	0,4	PTFE GM201	24292289	○
240	215	12,1	12,5	12,5	10	0,4	PTFE GM201	24224705	○
245	215	14,5	15	15	12	0,8	PTFE GM201	24214298	○
250	220	14,5	15	15	12	0,8	PTFE GM201	24096114	●
260	230	14,5	15	15	12	0,8	PTFE GM201	24129020	●
270	240	14,5	15	15	12	0,8	PTFE GM201	24214997	●
275	245	14,5	15	15	12	0,8	PTFE GM201	24224541	○
280	250	14,5	15	15	12	0,8	PTFE GM201	24075829	●

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d	H	L	Profile	C	R ₁	Material	Article No.	
285	255	14,5	15	15	12	0,8	PTFE GM201	24215698	○
290	260	14,5	15	15	12	0,8	PTFE GM201	24224702	○
300	270	14,5	15	15	12	0,8	PTFE GM201	24064404	●
305	275	14,5	15	15	12	0,8	PTFE GM201	24199259	○
310	280	14,5	15	15	12	0,8	PTFE GM201	24136342	●
320	290	14,5	15	15	12	0,8	PTFE GM201	24096115	●
325	295	14,5	15	15	12	0,8	PTFE GM201	24250595	○
327,5	297,5	14,5	15	15	12	0,8	PTFE B602	24349382	○
330	300	14,5	15	15	12	0,8	PTFE GM201	24137235	●
335	305	14,5	15	15	12	0,8	PTFE GM201	24235222	○
340	310	14,5	15	15	12	0,8	PTFE GM201	24075894	●
340	310	14,5	15	15	12	0,8	PTFE B602	24378518	○
350	320	14,5	15	15	12	0,8	PTFE GM201	24141407	●
355	325	14,5	15	15	12	0,8	PTFE GM201	24214995	○
360	330	14,5	15	15	12	0,8	PTFE GM201	24096116	●
370	340	14,5	15	15	12	0,8	PTFE GM201	24193346	○
380	350	14,5	15	15	12	0,8	PTFE GM201	24129082	●
390	360	14,5	15	15	12	0,8	PTFE GM201	24175268	●
400	370	14,5	15	15	12	0,8	PTFE GM201	24096117	●
455	420	17	17,5	17,5	12	1,2	PTFE GM201	24235223	○
460	425	17	17,5	17,5	12	1,2	PTFE GM201	24090834	○
460	430	14,5	15	15	12	1,2	PTFE GM201	24373069	○
470	435	17	17,5	17,5	12	1,2	PTFE GM201	24261687	○
475	440	17	17,5	17,5	12	1,2	PTFE B602	528872	○
510	475	17	17,5	17,5	12	1,2	PTFE GM201	24357906	○
520	485	17	17,5	17,5	12	1,2	PTFE GM201	24179374	○
530	495	17	17,5	17,5	12	1,2	PTFE GM201	24195593	○
540	505	17	17,5	17,5	12	1,2	PTFE GM201	24090835	○
550	515	17	17,5	17,5	12	1,2	PTFE GM201	24135192	●
560	525	17	17,5	17,5	12	1,2	PTFE GM201	24108716	○
565	530	17	17,5	17,5	12	1,2	PTFE GM201	24227409	○
570	535	17	17,5	17,5	12	1,2	PTFE GM201	24127145	●
580	545	17	17,5	17,5	12	1,2	PTFE GM201	24215675	○
590	555	17	17,5	17,5	12	1,2	PTFE GM201	24144379	○
600	565	17	17,5	17,5	12	1,2	PTFE GM201	24224706	●
610	575	17	17,5	17,5	12	1,2	PTFE GM201	24224709	○
620	585	17	17,5	17,5	12	1,2	PTFE GM201	24191196	●

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	L	Profile	C	R ₁	Material	Article No.	
630	595	17	17,5	17,5	12	1,2	PTFE GM201	24139430	○
640	605	17	17,5	17,5	12	1,2	PTFE GM201	24224708	○
650	615	17	17,5	17,5	12	1,2	PTFE GM201	24224711	○
655	620	17	17,5	17,5	12	1,2	PTFE GM201	49015993	○
660	625	17	17,5	17,5	12	1,2	PTFE GM201	24214031	○
670	635	17	17,5	17,5	12	1,2	PTFE GM201	24224714	○
680	645	17	17,5	17,5	12	1,2	PTFE GM201	24224724	○
690	655	17	17,5	17,5	12	1,2	PTFE GM201	24224729	○
700	665	17	17,5	17,5	12	1,2	PTFE GM201	24143108	○
710	675	17	17,5	17,5	12	1,2	PTFE GM201	24188274	○
720	685	17	17,5	17,5	12	1,2	PTFE GM201	24178331	○
730	695	17	17,5	17,5	12	1,2	PTFE GM201	24224726	○
740	705	17	17,5	17,5	12	1,2	PTFE GM201	24224731	○
750	715	17	17,5	17,5	12	1,2	PTFE GM201	24191361	○
770	730	19,5	20	20	15	1,2	PTFE GM201	24146978	○
775	735	19,5	20	20	15	1,2	PTFE GM201	24377268	○
780	740	19,5	20	20	15	1,2	PTFE GM201	24224727	○
800	760	19,5	20	20	15	1,2	PTFE GM201	24149064	○
820	780	19,5	20	20	15	1,2	PTFE GM201	24179588	○
830	790	19,5	20	20	15	1,2	PTFE GM201	24224717	○
840	800	19,5	20	20	15	1,2	PTFE GM201	24194420	○
850	810	19,5	20	20	15	1,2	PTFE GM201	24193103	○
855	815	19,5	20	20	15	1,2	PTFE GM201	24239928	○
870	830	19,5	20	20	15	1,2	PTFE GM201	24358273	○
880	840	19,5	20	20	15	1,2	PTFE GM201	24188752	○
890	850	19,5	20	20	15	1,2	PTFE GM201	24192177	○
900	860	19,5	20	20	15	1,2	PTFE GM201	24140132	○
920	880	19,5	20	20	15	1,2	PTFE GM201	24224723	○
930	890	19,5	20	20	15	1,2	PTFE GM201	49011296	○
940	900	19,5	20	20	15	1,2	PTFE GM201	24234404	○
950	910	19,5	20	20	15	1,2	PTFE GM201	24224728	○
965	925	19,5	20	20	15	1,2	PTFE GM201	24128975	●
980	940	19,5	20	20	15	1,2	PTFE GM201	24224716	○
1000	960	19,5	20	20	15	1,2	PTFE GM201	24132056	●
1050	1010	19,5	20	20	15	1,2	PTFE GM201	24343584	●
1090	1050	19,5	20	20	15	1,2	PTFE GM201	530622	○
1100	1060	19,5	20	20	15	1,2	PTFE GM201	24217067	○
1120	1080	19,5	20	20	15	1,2	PTFE GM201	24224715	○
1140	1100	19,5	20	20	15	1,2	PTFE GM270	24182638	○
1160	1120	19,5	20	20	15	1,2	PTFE GM201	49002143	○
1180	1140	19,5	20	20	15	1,2	PTFE GM270	24361419	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal Simko 300

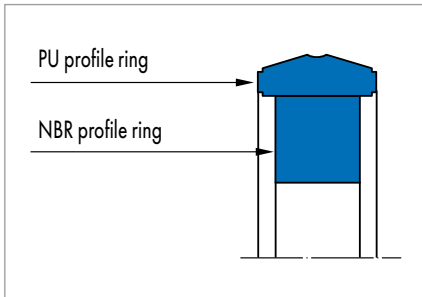


Fig. 1 Merkel Compact Seal Simko 300

Product description

Two-piece Merkel Compact Seal Simko 300 comprising one profile ring with pronounced sealing edge and one contact pressure element for producing the pre-load.

Product advantages

- Double-acting Merkel piston seal
- Good static and dynamic tightness
- Low friction, smooth movement even at low running speeds
- Contact pressure element with rectangular cross-section, prevents twisting in the housing
- Standardised housings according to ISO 7425
- Low axial housing heights.

Application

Earth moving equipment, agricultural machinery, injection moulding machines, industrial vehicles, cranes, loading platforms.

Material

Profile ring

Material	Code	Hardness
Polyurethane	98 AU 928	98 Shore A

Contact pressure element

D ≤ 63

Material	Code	Hardness
Nitrile rubber NBR	72 NBR 872	72 Shore A

Contact pressure element

D > 63

Material	Code	Hardness
Nitrile rubber NBR	80 NBR 709	80 Shore A

Operating conditions

Material	98 AU 928/72 NBR 872 98 AU 928/80 NBR 709
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +40
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +60
HEPG (glycol)	-30 ... +40
Mineral greases	-30 ... +100
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤ 2,5 µm
Groove base	≤ 1,6 µm	≤ 6,3 µm
Groove flanks	≤ 3,0 µm	≤ 15,0 µm

Percentage contact area M_v > 50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Profile	Max. permissible gap dimension			
	16 MPa	26 MPa	32 MPa	40 MPa
3,2	0,30	0,20	–	–
4,2	0,40	0,30	0,20	–
6,3	0,50	0,40	0,30	0,25
8,1	0,60	0,50	0,40	0,35
10,5	0,65	0,55	0,45	0,40

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

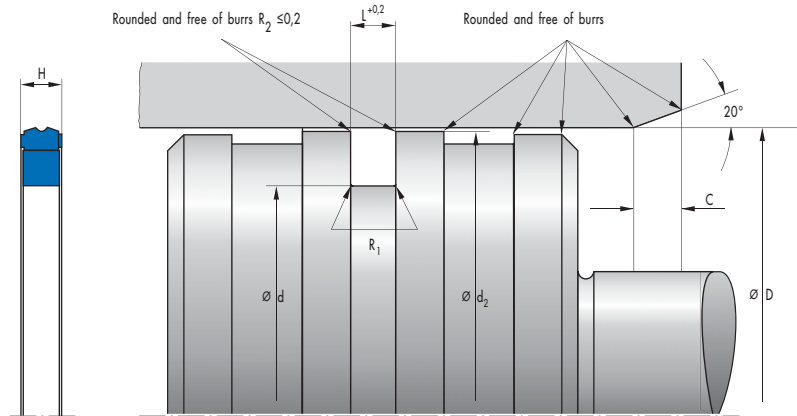
Nominal Ø D	D	d
≤200	H9	h9

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



D	d	H	L	Profile	C	R ₁	Housing	Material	Article No.	
20	12,5	3	3,2	3,75	2	0,2	ISO	98 AU P00928	417924	●
25	17,5	3	3,2	3,75	2	0,2	ISO	98 AU P00928	416478	●
30	22,5	3	3,2	3,75	2	0,2		98 AU P00928	416479	●
32	24,5	3	3,2	3,75	2	0,2	ISO	98 AU P00928	416480	●
35	24	4	4,2	5,5	2,5	0,3		98 AU P00928	410747	○
40	24,5	6	6,3	7,75	3	0,3		98 AU P00928	416483	○
40	29	4	4,2	5,5	2,5	0,3	ISO	98 AU P00928	416481	●
45	34	4	4,2	5,5	2,5	0,3		98 AU P00928	416484	●
50	34,5	6	6,3	7,75	3	0,3	ISO	98 AU P00928	416486	●
50	39	4	4,2	5,5	2,5	0,3	ISO	98 AU P00928	417293	●
55	39,5	6	6,3	7,75	3	0,3		98 AU P00928	417294	●
60	44,5	6	6,3	7,75	3	0,3		98 AU P00928	417295	●
60	49	4	4,2	5,5	2,5	0,3		98 AU P00928	416490	●
63	47,5	6	6,3	7,75	3	0,3	ISO	98 AU P00928	416491	●
63	52	4	4,2	5,5	2,5	0,3	ISO	98 AU P00928	416494	●
65	49,5	6	6,3	7,75	4	0,3		98 AU P00928	505020	●
70	54,5	6	6,3	7,75	4	0,3		98 AU P00928	417299	●
70	59	4	4,2	5,5	3	0,3		98 AU P00928	416495	●
75	59,5	6	6,3	7,75	4	0,3		98 AU P00928	416497	●
80	59	7,8	8,1	10,5	5	0,4		98 AU P00928	411795	●
80	59	10	10,5	10,5	7	0,4		98 AU P00928	417457	●
80	64,5	6	6,3	7,75	4	0,3	ISO	98 AU P00928	417302	●
85	69,5	6	6,3	7,75	4	0,3		98 AU P00928	505018	●
90	69	7,8	8,1	10,5	5	0,4		98 AU P00928	416501	○
90	69	10	10,5	10,5	7	0,4		98 AU P00928	416502	●
90	74,5	6	6,3	7,75	4	0,3		98 AU P00928	417304	●
95	79,5	6	6,3	7,75	4	0,3		98 AU P00928	416503	●
100	79	7,8	8,1	10,5	5	0,4		98 AU P00928	416504	●
100	84,5	6	6,3	7,75	4	0,3	ISO	98 AU P00928	417305	●
105	89,5	6	6,3	7,75	4	0,3		98 AU P00928	416505	●
110	89	7,8	8,1	10,5	5	0,4		98 AU P00928	417307	●
110	89	10	10,5	10,5	7	0,4		98 AU P00928	416507	○
110	94,5	6	6,3	7,75	4	0,3		98 AU P00928	416508	●
115	94	7,8	8,1	10,5	5	0,4		98 AU P00928	416514	●
120	99	7,8	8,1	10,5	5	0,4		98 AU P00928	410001	●

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	L	Profile	C	R ₁	Housing	Material	Article No.	
120	99	10	10,5	10,5	7	0,4		98 AU P00928	416515	●
125	104	7,8	8,1	10,5	5	0,4	ISO	98 AU P00928	416516	●
125	104	10	10,5	10,5	7	0,4		98 AU P00928	416517	●
125	109,5	6	6,3	7,75	4	0,3	ISO	98 AU P00928	418089	●
130	109	7,8	8,1	10,5	5	0,4		98 AU P00928	409999	●
135	114	7,75	8,1	10,5	7	0,4		98 AU P00928	49014374	○
140	119	7,8	8,1	10,5	5	0,4		98 AU P00928	417954	●
140	119	10	10,5	10,5	7	0,4		98 AU P00928	416518	●
150	129	7,8	8,1	10,5	7	0,4		98 AU P00928	49031265	●
150	129	10	10,5	10,5	7	0,4		98 AU P00928	416519	●
160	139	7,8	8,1	10,5	5	0,4	ISO	98 AU P00928	416520	●
180	159	7,8	8,1	10,5	5	0,4		98 AU P00928	417470	●
200	175	12	12,5	12,5	9	0,4	ISO	98 AU P00928	418081	○
200	179	7,8	8,1	10,5	5	0,4	ISO	98 AU P00928	418085	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal Simko 320 X2

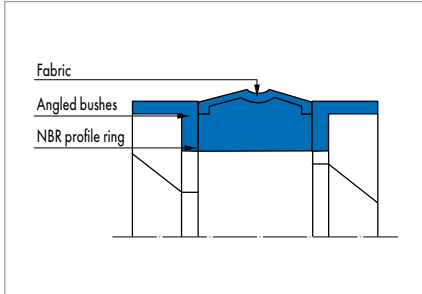


Fig. 1 Merkel Compact Seal Simko 320 X2

Product description

Three-piece Merkel Compact Seal Simko 320 X2 consisting of a fabric reinforced elastomeric sealing element and two guide back-up rings.

Product advantages

Double-acting Merkel piston seal with integrated guide back-up rings.

Application

Earth moving equipment, agricultural machinery, cranes, standard cylinders. We recommend more modern series for new designs.

Material

Sealing component

Material	Hardness
Nitrile rubber NBR and fabric reinforcement	80 Shore A

Guide back-up rings

Material
Polyamide

Operating conditions

Material	80 NBR 878/Polyamide
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

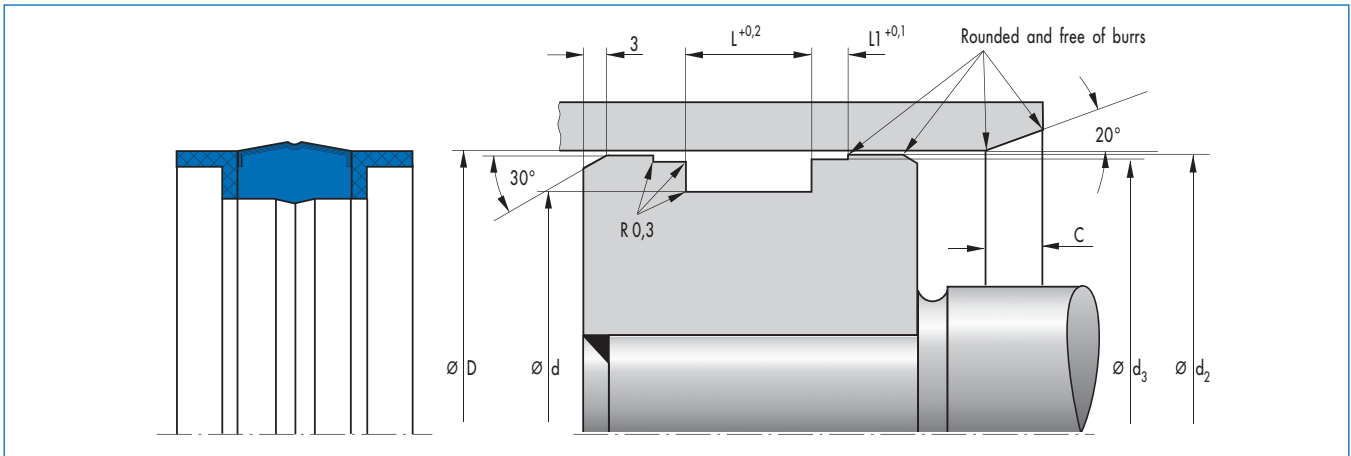
Tolerance recommendation

Nominal Ø D	D	d	d ₂	d ₃
25 ... 250	H11	h11	±0,07	f8

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal. → Technical Manual.

Article list



D	d	L	L ₁	L ₂	d ₁	d ₂	d ₃	C	Material	Article No.	
25	17	13,5	3,2	2,1	14	24,4	21	4	80 NBR M00878	10600	○
30	22	13,5	3,2	2,1	19	29,4	26	4	80 NBR M00878	10605	○
32	24	13,5	3,2	3,1	21	31,4	28	4	80 NBR M00878	10607	○
35	27	15,5	3,2	3,1	24	34,4	31	4	80 NBR M00878	10613	○
40	32	15,5	3,2	3,1	29	39,4	36	4	80 NBR M00878	10618	○
45	37	15,5	15,5	3,2	34	44,4	41	4	80 NBR M00878	10636	○
50	38	20,5	4,2			49,4	46	4	80 NBR M00878	10642	○
60	48	20,5	4,2			59,4	56	4	80 NBR M00878	10647	○
63	51	20,5	4,2			62,4	59	4	80 NBR M00878	10651	○
70	58	20,5	4,2			69,4	66	4	80 NBR M00878	10660	○
80	66	22,5	5,2			79,4	76	5	80 NBR M00878	10682	○
90	76	22,5	5,2			89,4	86	5	80 NBR M00878	10696	○
100	86	22,5	5,2			99,4	96	5	80 NBR M00878	10700	○
110	96	22,5	5,2			109,4	106	5	80 NBR M00878	10702	○
120	106	22,5	5,2			119,4	116	6	80 NBR M00878	10707	○
125	108	26,5	7,2			124,4	121	6	80 NBR M00878	10714	○
140	123	26,5	7,2			139,4	136	6	80 NBR M00878	10738	○
150	133	26,5	7,2			149,4	146	6	80 NBR M00878	10751	○
160	143	26,5	7,2			159,4	156	6	80 NBR M00878	10752	○
180	163	26,5	7,2			179,4	176	6	80 NBR M00878	10753	○
200	180	31,5	9,2			199,4	196	6	80 NBR M00878	10766	○
220	200	31,5	9,2			219,4	216	6	80 NBR M00878	18119	○
250	230	31,5	9,2			249,4	246	6	80 NBR M00878	18120	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal Simko 520

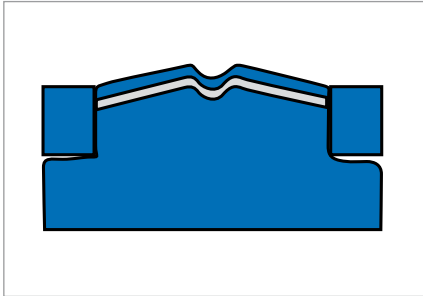


Fig. 1 Merkel Compact Seal Simko 520

Product description

Three-piece Merkel Compact Seal Simko 520 consisting of a fabric reinforced elastomeric sealing element and two guide back-up rings as gap sealing component.

Product advantages

Double-acting Merkel piston seal, preferably for spare parts requirement.

Application

Earth moving equipment, agricultural machinery, cranes, standard cylinders. We recommend more modern series for new designs.

Material

Sealing component

Material	Hardness
Nitrile rubber NBR and fabric reinforcement	80 Shore A

Guide back-up rings

Material	Code
Polyacetal resin	POM 992020

Operating conditions

Material	80 NBR/POM
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	50
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Ø range D	Max. permissible gap dimension			
	26 MPa	32 MPa	40 MPa	50 MPa
≤80	0,60	0,55	0,45	0,35
>80	0,65	0,60	0,50	0,40

Tolerance recommendation and dimension d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

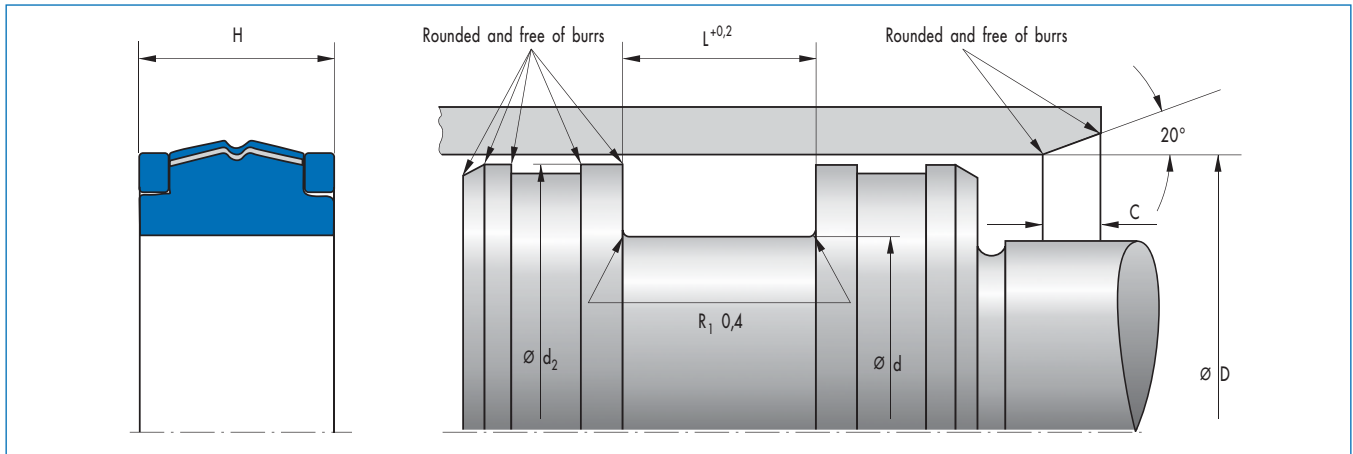
Nominal Ø D	D	d
≤320	H11	h11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



D	d	H	L	C	Material	Article No.	
40	32	9	9,5	4	80 NBR M00878	141475	●
50	38	11	11,5	4	80 NBR M00878	316637	○
50	38	14	14,5	4	80 NBR M00878	125346	●
63	50	14	14,5	4	80 NBR M00878	371339	○
63	51	14	14,5	4	80 NBR M00878	316673	●
75	63	18	18,5	4	80 NBR M00878	121438	●
80	66	16	16,5	5	80 NBR M00878	358382	○
90	76	16	16,5	5	80 NBR M00878	116822	○
100	86	16	16,5	5	80 NBR M00878	423522	●
105	91	16	16,5	5	80 NBR M00878	114022	○
110	95	15	15,5	5	80 NBR M00878	309987	●
120	105	15	15,5	6	80 NBR M00878	309907	○
125	110	15,2	15,7	6	80 NBR M00878	309906	○
130	113	20	20,5	6	80 NBR M00878	114340	●
135	118	20	20,5	6	80 NBR M00878	124180	○
140	125	15,4	15,9	6	80 NBR M00878	330336	○
150	135	15	15,5	6	80 NBR M00878	309903	○
160	143	19,5	20	6	80 NBR M00878	117577	○
165	150	15	15,5	6	80 NBR M00878	129309	○
185	165	15	15,5	6	80 NBR M00878	143164	○
200	180	15	15,5	6	80 NBR M00878	145832	○
210	190	15	15,5	6	80 NBR M00878	143158	○
220	200	19,5	20	6	80 NBR M00878	150760	○
225	205	24	24,5	6	80 NBR M00878	309905	○
250	230	25	25,5	6	80 NBR M00878	149494	○
280	255	24,3	24,8	6	80 NBR M00878	122825	●
320	300	25	25,5	6	80 NBR M00878	122735	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal L 27

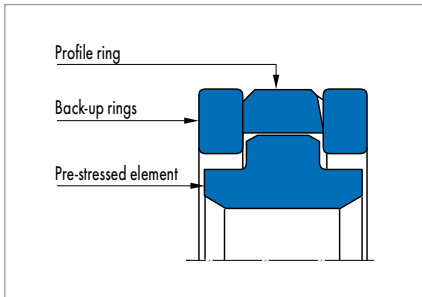


Fig. 1 Merkel Compact Seal L 27

Product description

Four-piece Merkel Compact Seal L 27 comprising one pre-load component (NBR), two active back-up rings (POM) and one PTFE bronze profile ring.

Product advantages

The Merkel Piston Seal L 27 is used where a piston has pressure on both sides. The activated back-up rings offer good protection against extrusion even with gaps for breathing

- Bridges large radial gaps
- Very good protection against extrusion even with pressure peaks
- High resistance to abrasion
- Low friction, free of stick-slip
- High contact pressure due to elastomer profile ring.

Application

Earth moving equipment, injection moulding machines, presses, excavators.

Material

PTFE profile ring

Material	Code
PTFE bronze compound	PTFE B602

Pre-load component

Material	Code	Hardness
Nitrile rubber NBR	85 NBR B247/85 NBR B203	85 Shore A

Back-up ring

Material	Code
Polyacetal	POM PO202

Operating conditions

Material	PTFE B602/ 85 NBR B247/ POM PO202	PTFE B602/ 85 NBR B203/ POM PO202
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +100
HFA fluids	-	-
HFB fluids	-	-
HFC fluids	-	-
HFD fluids	-	-
Water	-	-
HETG (rapeseed oil)	-30 ... +80	-30 ... +80
HEES (synthetic esters)	-30 ... +80	-30 ... +80
HEPG (glycol)	-30 ... +50	-30 ... +50
Mineral greases	-30 ... +100	-30 ... +100
Pressure p in MPa	50	
Running speed v in m/s	1,5	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

		16 MPa					26 MPa				
Nominal Ø D	Pro- file	D	d	D2	DF	X2	D	d	D2	DF	X2
... 70	6,0	H8	h9	h9	h8	0,8	H8	h9	h9	h8	0,7
>70 ... 110	8,5	H8	h9	h9	h8	1,2	H8	h9	h9	h8	1,0
>110 ... 200	10,0	H8	h9	h9	h8	1,2	H8	h9	h9	h8	1,0
>200 ... 350	12,5	H8	h9	h9	h8	1,8	H8	h9	h9	h8	1,4

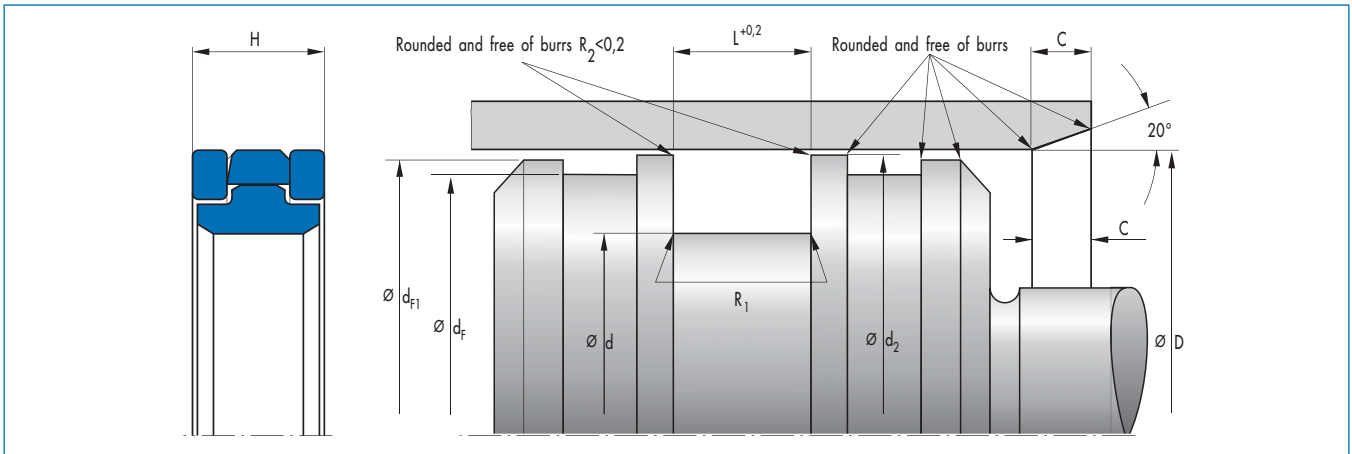
		32 MPa					40 MPa				
Nominal Ø D	Pro- file	D	d	D2	DF	X2	D	d	D2	DF	X2
... 70	6,0	H8	h9	h9	h8	0,50	H8	h9	h9	h8	0,4
>70 ... 110	8,5	H8	h9	h9	h8	0,65	H8	h9	h9	h8	0,5
>110 ... 200	10,0	H8	h9	h9	h8	0,65	H8	h9	h9	h8	0,5
>200 ... 350	12,5	H8	h9	h9	h8	0,90	H8	h9	h9	h8	0,7

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



D	d	H	L	Profile	C	R ₁	Material	Article No.	
50	38	9	10	6	6	0,5	PTFE B602	24361313	●
63	51	9	10	6	6	0,5	PTFE B602	24361314	○
70	53	13,4	14	8,5	8	0,5	PTFE B602	24375726	●
80	63	13,4	14	8,5	8	0,5	PTFE B602	24361315	●
90	73	13,4	14	8,5	8	0,5	PTFE B602	24351815	●
100	83	13,4	14	8,5	8	0,5	PTFE B602	24359198	●
105	88	13,4	14	8,5	8	0,5	PTFE B602	24346227	●
110	93	13,4	14	8,5	8	0,5	PTFE B602	24360184	●
115	98	13,4	14	8,5	8	0,5	PTFE B602	24355371	○
120	103	13,4	14	8,5	8	0,5	PTFE B602	24360185	○
125	108	13,4	14	8,5	8	0,5	PTFE B602	24355372	●
130	105	18,4	19	12,5	8	0,5	PTFE B602	24360186	○
140	115	18,4	19	12,5	10,5	0,5	PTFE B602	24360788	○
150	125	18,4	19	12,5	10,5	0,5	PTFE B602	24361316	○
150	130	16,8	17,5	10	10,5	0,5	PTFE B602	24181687	○
160	135	18,4	19	12,5	10,5	0,5	PTFE B602	24361317	○
165	140	18,4	19	12,5	10,5	0,5	PTFE B602	24361318	○
180	155	18,4	19	12,5	10,5	0,5	PTFE B602	24361319	○
200	175	18,4	19	12,5	10,5	0,5	PTFE B602	24361320	○
250	225	18,4	19	12,5	10,5	0,5	PTFE B602	24370692	○
280	255	18,4	19	12,5	10,5	0,5	PTFE B602	24370693	○
300	275	18,4	19	12,5	10,5	0,5	PTFE B602	24370694	○
320	295	18,4	19	12,5	10,5	0,5	PTFE B602	24370695	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal L 43

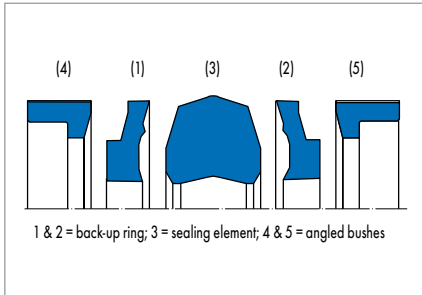


Fig. 1 Merkel Compact Seal L 43

Product description

Five-piece Merkel compact seal L 43 comprising one profile ring, two back-up rings and two angled bushes.

Product advantages

The Merkel Piston Seal L 43 is used for sealing pistons with pressure on both sides. The angled rings guide the piston on the cylinder bore.

- No extrusion into the radial sealing gap
- Suitable for rapid pressure change
- Sealing component protected against twisting.

Application

Earth moving equipment, agricultural machinery, cranes, standard cylinders.

Material

Sealing component

Material	Code	Hardness
Nitrile rubber	78 NBR B281	78 Shore A

Back-up ring

Material	Code
Polyester elastomer	97 TPE TP113

Angled bush

Material	Code
Polyamide with special filling	PA 6.501

Operating conditions

Material	78 NBR B281/97 TPE TP113/PA 6.501
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	+5 ... +50
HFD fluids	-
Water	-
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +100
Pressure p in MPa	40
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

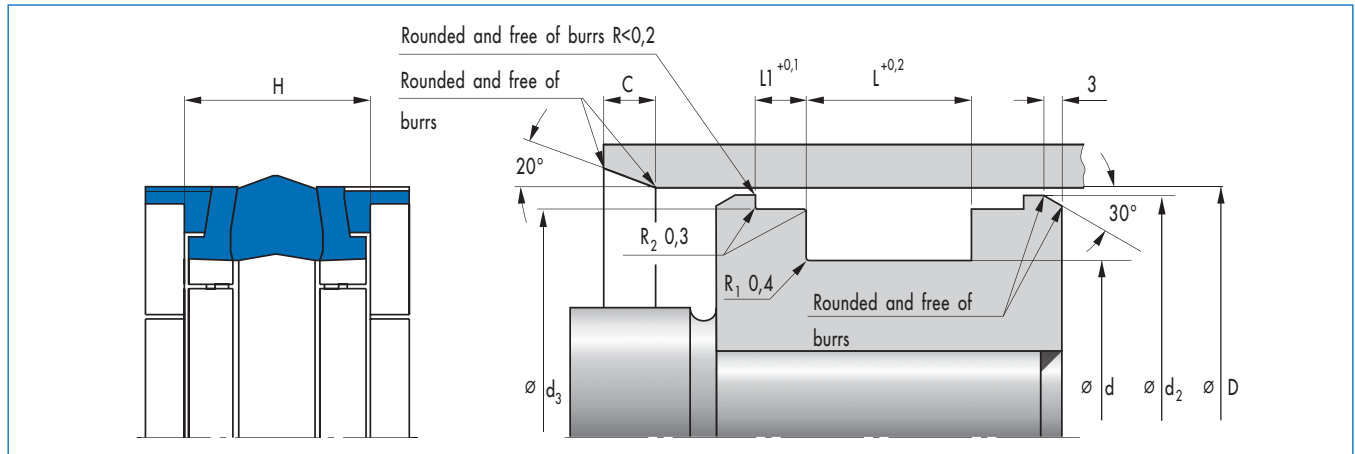
Tolerance recommendation

Nominal \varnothing D	D	d	d ₂	d ₃
40 ... 200	H8	h9	h11	h8

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



D	d	L	L ₁	d ₂	d ₃	H	Profile	C	Material	Article No.	
32	22	16,4	6,35	30,5	28,5	16,4	5	4	75 NBR B281	529741	○
40	24	18,4	6,4	38,7	35,4	18,4	8	4	75 NBR B281	24251786	●
40	26	15,5	2,6	39	36	15,5	7	4	75 NBR B281	24251780	●
40	30	16,4	6,35	38,5	35,4	16,4	5	4	75 NBR B281	529742	○
45	31	15,5	2,6	44	41	15,5	7	4	75 NBR B281	24265145	●
50	34	18,4	6,4	48,7	45,4	18,4	8	4	75 NBR B281	24251792	●
50	34	20,5	3,1	49	46	20,5	8	4	75 NBR B281	24251797	●
55	39	18,4	6,35	53,65	50,37	18,4	8	4	75 NBR B281	529744	○
55	39	20,5	3,1	54	51	20,5	8	4	75 NBR B281	24251802	●
60	44	18,4	6,4	58,7	55,4	18,4	8	4	75 NBR B281	24251781	●
60	44	20,5	3,1	59	56	20,5	8	4	75 NBR B281	24251787	●
63	47	18,4	6,4	61,7	58,4	18,4	8	4	75 NBR B281	24251793	●
63	47	19,4	6,4	61,7	58,4	19,4	8	4	75 NBR B281	24251798	●
63	47	20,5	3,1	62	59	20,5	8	4	75 NBR B281	24251803	●
65	49	20,5	3,1	64	61	20,5	8	4	75 NBR B281	24289999	●
65	50	18,4	6,35	63,64	60,41	18,4	7,5	4	75 NBR B281	529745	○
70	50	22,4	6,4	68,3	64,2	22,4	10	4	75 NBR B281	24251788	●
70	54	20,5	3,1	69	66	20,5	8	4	75 NBR B281	24251782	●
75	55	22,4	6,4	73,3	69,2	22,4	10	4	75 NBR B281	24380527	●
75	59	20,5	3,1	74	71	20,5	8	4	75 NBR B281	24379140	●
80	60	22,4	6,4	78,3	74,2	22,4	10	5	80 NBR B281	24251794	●
80	62	22,5	3,6	79	76	22,5	9	5	75 NBR B281	24251799	●
85	65	22,4	6,35	83,34	79,16	22,4	10	5	75 NBR B281	529746	○
85	65	22,4	6,35	83,34	79,16	22,4	10	5	75 NBR B281	49001921	○
85	65	22,5	6,4	93,3	79,2	22,4	10	5	75 NBR B281	24314803	●
90	70	22,4	6,4	88,3	84,2	22,4	10	5	75 NBR B281	24251804	●
90	72	22,5	3,6	89	86	22,5	9	5	75 NBR B281	24251783	●
95	75	22,4	6,35	93,31	89,15	22,4	10	5	75 NBR B281	529747	○
100	75	22,4	6,4	98	93,2	22,4	12,5	5	75 NBR B281	24251789	●
100	82	22,5	3,6	99	96	22,5	9	5	75 NBR B281	24251795	●
105	80	22,5	6,4	103	98,1	22,5	12,5	5	75 NBR B281	24330610	●
110	85	22,4	6,4	108	103,2	22,4	12,5	5	75 NBR B281	24251800	●
110	92	22,5	3,6	109	106	22,5	9	5	75 NBR B281	24251805	●
120	95	22,4	6,4	118	113,1	22,4	12,5	6	75 NBR B281	24378461	●
125	100	25,4	6,4	123	118,1	25,4	12,5	6	75 NBR B281	24267856	●

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	L	L ₁	d ₂	d ₃	H	Profile	C	Material	Article No.	
125	103	26,5	5,1	124	121	26,5	11	6	75 NBR B281	24251784	●
135	110	25,4	9,5	132,5	127,6	25,4	12,5	6	75 NBR B281	24380523	○
140	115	25,4	6,4	138	133	25,4	12,5	6	75 NBR B281	24251790	●
140	118	26,5	5,1	139	136	26,5	11	6	75 NBR B281	24251796	●
150	128	26,5	5,1	149	146	26,5	11	6	75 NBR B281	24266979	●
160	130	25,4	6,4	158	153	25,4	15	6	80 NBR B281	24251801	●
160	138	26,5	5,1	159	156	26,5	11	6	75 NBR B281	24251785	●
165	143	26,5	5,1	164	161	26,5	11	6	75 NBR B281	24266980	●
180	155	25,4	12,75	177,5	171,7	25,4	12,5	6	75 NBR B281	24380750	○
180	158	26,5	5,1	179	176	26,5	11	6	75 NBR B281	24251791	●
185	160	25,4	12,75	182,5	176,7	25,4	12,5	6	75 NBR B281	24380749	○
200	175	31,5	6,6	199	196	31,5	12,5	6	75 NBR B281	24251674	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal T 19

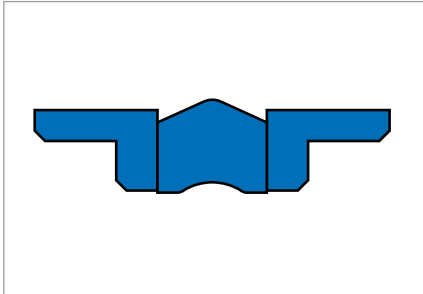


Fig. 1 Merkel Compact Seal T 19

Product description

Three-piece Merkel Compact Seal T 19 with two angled bushes (POM) and one sealing component of polyurethane.

Product advantages

The Merkel Compact Seal T 19 is used where a piston has pressure on both sides and is designed mainly for housings according to ISO 6547

- Good guiding
- Highly wear-resistant
- Easy fitting
- Short.

Application

Agricultural machinery, standard cylinders.

We recommend more modern series for new designs.

Material

Sealing component

Material	Code	Hardness
Novathan (polyurethane)	95 AU V142	95 Shore A

Angled bushes

Material	Hardness
Polyacetal POM	POM PO 202

Operating conditions

Material	95 AU V142
Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-40 ... +100
Pressure p in MPa	21
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

When designing d2, the admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account. → Technical Manual.

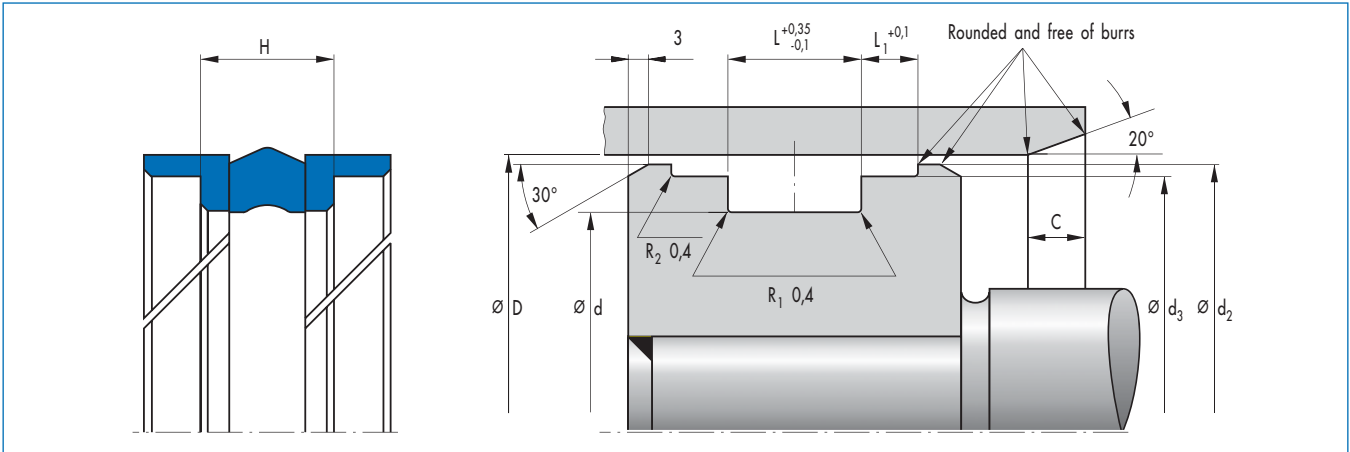
Nominal Ø D	D	d	d2	d3
25 ... 100	H8	h9	h11	h7

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

→ Technical Manual.

Article list



D	d	d ₂	d ₃	H	L	L ₁	Profile	C	Housing	Material	Article No.	
25	17	24	22	9,3	10	4	4	2	ISO	95 AU V142	24314979	○
32	24	31	29	9,3	10	4	4	2	ISO	95 AU V142	24306315	●
40	32	39	37	9,3	10	4	4	2	ISO	95 AU V142	24264801	●
50	40	49	47	11,6	12,5	4	5	2,5	ISO	95 AU V142	24269657	●
63	53	62	60	11,6	12,5	4	5	2,5	ISO	95 AU V142	24237695	●
70	60	69	67	11,65	12,5	4	5	2,5		95 AU V142	24299663	●
80	70	79	77	11,6	12,5	4	5	2,5		95 AU V142	24262188	●
90	80	88,5	86	11,65	12,5	5	5	2,5		95 AU V142	24314955	●
100	90	98,5	96	11,6	12,5	5	5	2,5		95 AU V142	24314956	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Compact Seal TFMA

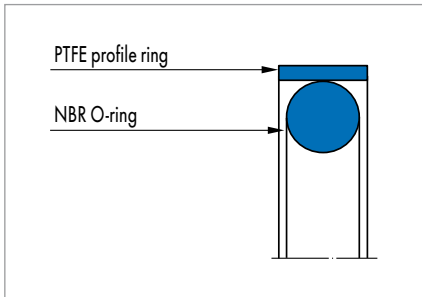


Fig. 1 Merkel Compact Seal TFMA

Product description

Two-piece Merkel Compact Seal TFMA comprising a profile ring and O-ring as a pre-load component.

Product advantages

Double-acting piston seal for the lower pressure range with the properties of

- Low friction
- Low housing height.

Application

Standard cylinders, cranes.

Material

Profile ring

Material	Code
PTFE bronze compound	PTFE 177023

O-ring

Material	Hardness
Nitrile rubber NBR	70 Shore A

Operating conditions

Material	PTFE 177023/NBR
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	-
HFB fluids	-
HFC fluids	-
HFD fluids	-
Water	-
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	16
Running speed v in m/s	2

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% up to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

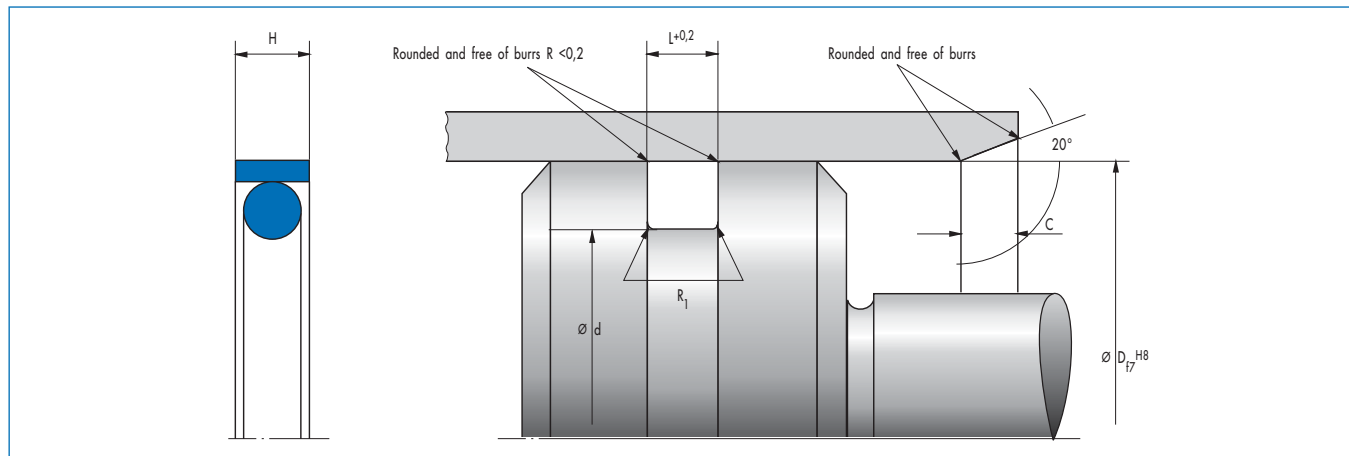
We recommend a metal guide H8/f7.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

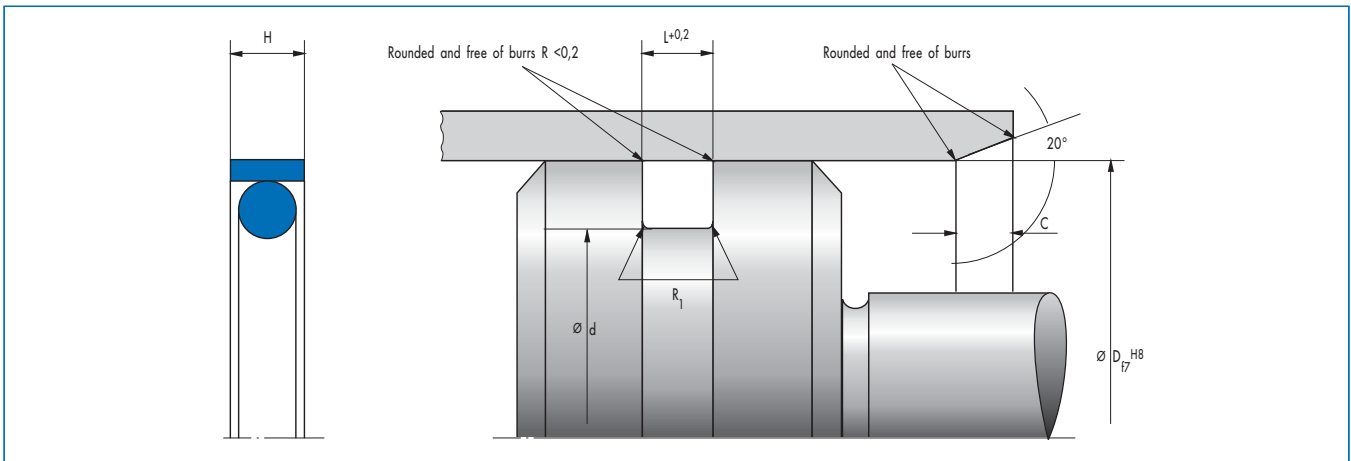
→ Technical Manual.

Article list



D	d	H	L	Profile	C	R ₁	Material	Article No.	
10	3,9	3	3,2	3,05	3	0,4	PTFE 177023	96028	○
12	5,9	3	3,2	3,05	3	0,4	PTFE 177023	98533	○
15	8,9	3	3,2	3,05	3	0,4	PTFE 177023	97882	○
16	9,9	3	3,2	3,05	3	0,4	PTFE 177023	98699	●
18	11,9	3	3,2	3,05	3	0,4	PTFE 177023	97889	●
20	13,9	3	3,2	3,05	3	0,4	PTFE 177023	98990	●
22	15,9	3	3,2	3,05	3	0,4	PTFE 177023	98386	●
25	17,8	3,8	4	3,6	3,5	0,5	PTFE 177023	95440	●
28	20,8	3,8	4	3,6	3,5	0,5	PTFE 177023	98534	●
30	22,8	3,8	4	3,6	3,5	0,5	PTFE 177023	97436	●
32	24,8	3,8	4	3,6	3,5	0,5	PTFE 177023	97878	●
35	27,8	3,8	4	3,6	3,5	0,5	PTFE 177023	98405	●
38	30,8	3,8	4	3,6	3,5	0,5	PTFE 177023	94313	○
40	32,8	3,8	4	3,6	3,5	0,5	PTFE 177023	97022	●
42	34,8	3,8	4	3,6	3,5	0,5	PTFE 177023	98536	●
45	37,8	3,8	4	3,6	3,5	0,5	PTFE 177023	97023	●
48	40,8	3,8	4	3,6	3,5	0,5	PTFE 177023	98537	○
50	42,8	3,8	4	3,6	3,5	0,5	PTFE 177023	96867	●
52	44,8	3,8	4	3,6	3,5	0,5	PTFE 177023	98538	○
55	47,8	3,8	4	3,6	3,5	0,5	PTFE 177023	96882	●
60	47,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97024	●
63	50,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	132794	○
65	52,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97025	○
70	57,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97026	○
75	62,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97027	○
80	67,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	94314	●
85	72,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97028	○
90	77,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97029	●
95	82,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97030	○
100	87,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97031	●
105	92,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	363282	○
110	97,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	363281	○
120	107,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97035	○
125	112,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97036	○
130	117,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97037	○

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d	H	L	Profile	C	R ₁	Material	Article No.	
140	127,8	7,3	7,5	6,1	7,5	0,8	PTFE 177023	97039	<input type="radio"/>
150	136,8	7,3	7,5	6,6	7,5	0,8	PTFE 177023	98759	<input type="radio"/>

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Complete Piston TDUOH

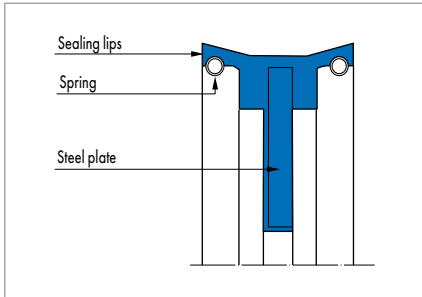


Fig. 1 Merkel Complete Piston TDUOH

Material

Sealing lips

Material	Code	Hardness
Nitrile rubber NBR	90 NBR 109	90 Shore A

Springs

Material
Spring steel wire DIN 17223

Base plate

Material
Mild steel

Product description

Merkel Complete Piston TDUOH with steel base plate and vulcanised, spring-loaded sealing lips.

Product advantages

Merkel complete piston for secondary hydraulic applications, preferably for spare parts requirement. Can only absorb low lateral forces.

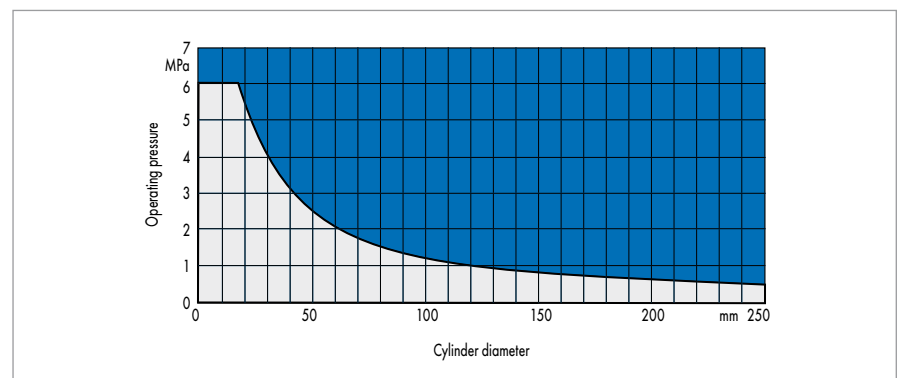
Application

Standard cylinders, cranes.

Operating conditions

Material	NBR 60 Shore A
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	→ Diagram
Running speed v in m/s	0,5

Permissible operating pressure



Surface quality

Surface roughness	R_a	R_{max}
Cylinder bore	0,05 ... 0,3 μm	$\leq 2,5 \mu\text{m}$

Percentage contact area M_v >50% to max. 90% at cutting depth $c = R_z/2$ and reference line $C_{ref} = 0\%$.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

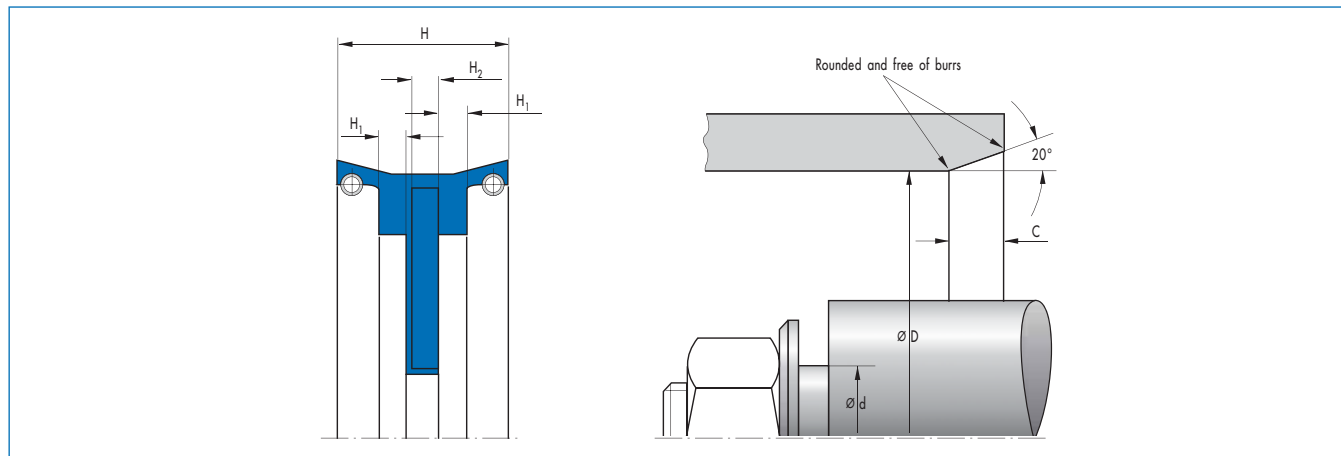
The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing d2. → Technical Manual.

Nominal Ø D	D	d
≤320	H11	h11

Fitting & installation

The Merkel Complete Piston TDUOH is pushed onto the pin with the rubber layer on the clamping flange towards the rod and fixed with the fastening. The nut has to be secured.

Article list



D	d	H	H ₁	H ₂	C	Code	Material	Article No.	
25	8	22	1,5	3	3,5	T DUO H25-19	90 NBR M00109	9620	●
26	8	22	1,5	3	3,5	T DUO H26-8	90 NBR M00109	9622	○
35	8	26	1,5	3	3,5	T DUO H35-19	90 NBR M00109	9634	●
40	10	25	2,5	3	5	T DUO H40-41	90 NBR M00109	9640	●
45	10	25	1,5	4	5	T DUO H45-26	90 NBR M00109	9651	●
50	10	25	1,5	4	5	T DUO H50-34	90 NBR M00109	9654	●
50	16	23	1,5	5	5	T DUO H50-41	90 NBR M00109	9656	○
62	41	30	1,5	5	5	T DUO H62-7	90 NBR M00109	9679	○
63	12	25	1,5	4	5	T DUO H63-4	90 NBR M00109	63684	●
65	12	25	1,5	4	5	T DUO H65-27	90 NBR M00109	9688	●
70	12	30	1,5	5	5,5	T DUO H70-37	90 NBR M00109	9707	●
75	12	30	1,5	5	5,5	T DUO H75-15	90 NBR M00109	11618	●
80	12	30	1,5	5	5,5	T DUO H80-37	90 NBR M00109	9733	●
85	12	35	1,5	6	5,5	T DUO H85-14	90 NBR M00109	9743	○
90	12	35	2	6	5,5	T DUO H90-23	90 NBR M00109	9746	●
100	12	35	2	6	5,5	T DUO H100-30	90 NBR M00109	9755	●
110	12	40	2	6	5,5	T DUO H110-7	90 NBR M00109	9762	○
120	20	40	2,5	8	7	T DUO H120-20	90 NBR M00109	9771	○
125	20	40	2,5	8	7	T DUO H125-21	90 NBR M00109	9777	●
130	20	40	2,5	8	7	T DUO H130-8	90 NBR M00109	9781	○
145	20	45	2,5	10	7	T DUO H145-4	90 NBR M00109	9786	○
150	20	40	2,5	10	7	T DUO H150-16	90 NBR M00109	9791	●
160	20	40	2,5	10	7	T DUO H160-10	90 NBR M00109	9795	●
175	20	40	2,5	10	7	T DUO H175-5	90 NBR M00109	9801	○
200	20	40	2,5	10	8	T DUO H200-9	90 NBR M00109	11606	●
230	30	40	2,5	12	8	T DUO H230-3	90 NBR M00109	11617	○
300	60	40	2,5	12	8	T DUO H300-9	90 NBR M00109	9811	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Cup Packing T with Spring

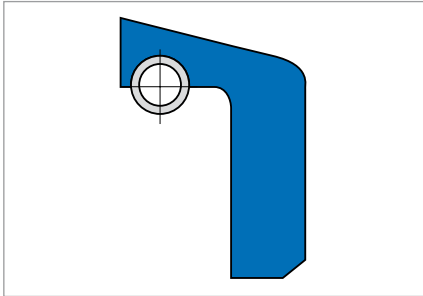


Fig. 1 Merkel Cup Packing T with Spring

Product description

Spring-loaded lip seal.
Clamping flange for axial fixing in the housing.

Product advantages

Single-acting piston seal for secondary applications and for spare parts requirement.

Application

Standard cylinders.

Material

Sealing component

Material	Code	Hardness
Nitrile rubber NBR	88 NBR 101	88 Shore A

Operating conditions

Material	88 NBR 101
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	1
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 μm	≤2,5 μm
Groove base	≤1,6 μm	≤6,3 μm
Groove flanks	≤3,0 μm	≤15,0 μm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. $x_2 \leq 0,5$. → Technical Manual.

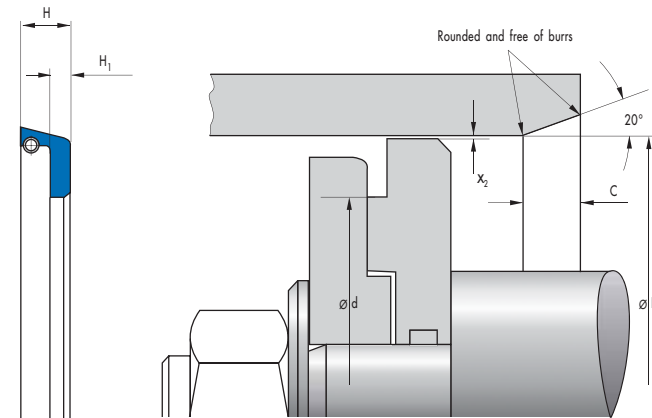
Tolerance recommendation

Nominal \varnothing D	D	d
≤ 550	H11	h10

Fitting & installation

The axial compression of the flange should be max. 10% of its thickness. Torque limiting is to be used. The metal clamping parts must not apply any force to the transition zone from clamping flange to sealing lip. To improve the fixing of the cup packing and sealing effect on the flat clamping side, the turning of one or two sealing grooves is recommended.

Article list



D	d	H	H ₁	C	Code	Material	Article No.	
20,4	8	2,5	0	3	T20.4-1	88 NBR M00101	14787	●
28	10	10	2	3	T28.0-3	88 NBR M00101	14866	○
30	10	10	3	3	T30.0-14	88 NBR M00101	14888	●
32	12	10	3	3	T32.0-8	88 NBR M00101	14911	○
35	10	10	3	3	T35.0-13	88 NBR M00101	14946	○
35	17	6	1,5	3	T35.0-34	88 NBR M00101	8387	○
36	12	10	3	3	T36.0-2	88 NBR M00101	14955	●
40	0	10	2	3	T40.0-5	88 NBR M00101	14992	○
40	18	15	3	3	T40.0-20	88 NBR M00101	15003	●
45	25	10	2,5	3	T45.0-4	88 NBR M00101	15040	●
50	0	12	3	3	T50.0-30	88 NBR M00101	15103	●
50	10,5	18	3,5	3	T50.0-5	88 NBR M00101	15086	○
50	25,4	12	2,5	3	T50.0-19	88 NBR M00101	15095	●
60	35	12	3	3	T60.0-8	88 NBR M00101	15168	●
60	35	12	3,5	3	T60.0-26	88 NBR M00101	15182	○
65	42	9	2,5	3,5	T65.0-6	88 NBR M00101	15210	●
70	20	13	3,5	3,5	T70.0-28	88 NBR M00101	15257	●
70	24	15	3	3,5	T70.0-15	88 NBR M00101	15247	●
70	40	12	3	3,5	T70.0-25	88 NBR M00101	15254	●
72	26	13	3	3,5	T72.0-1	88 NBR M00101	15269	●
75	50	10	2,5	3,5	T75.0-3	88 NBR M00101	15277	●
80	20	10	2	4	T80.0-25	88 NBR M00101	15312	○
80	42	11	2,5	4	T80.0-1	88 NBR M00101	15294	○
80	55	12	3	4	T80.0-5	88 NBR M00101	15296	○
95	25	16	3	4	T95.0-3	88 NBR M00101	15374	○
100	15	10	3	4	T100.0-7	88 NBR M00101	15386	○
100	60	15	3	4	T100.0-18	88 NBR M00101	15397	●
100	75	10	2,5	4	T100.0-1	88 NBR M00101	15381	●
103	15	15	3	4	T103.0-1	88 NBR M00101	15423	○
110	46	16	3	4	T110.0-3	88 NBR M00101	15435	●
115	76	20	3	4	T115.0-1	88 NBR M00101	15451	○
120	85	15	3,5	4	T120.0-2	88 NBR M00101	15459	○
125	37	20	4	5,5	T125.0-2	88 NBR M00101	15475	○
125	100	13	2,5	5,5	T125.0-13	88 NBR M00101	15484	○
130	80	10	2,5	5,5	T130.0-1	88 NBR M00101	15501	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	H ₁	C	Code	Material	Article No.	
140	73	15	3,5	5,5	T140.0-2	88 NBR M00101	15517	○
150	110	15	3	5,5	T150.0-6	88 NBR M00101	15543	●
165	60,5	20	4	5,5	T165.0-1	88 NBR M00101	15569	○
170	26	20	4	5,5	T170.0-1	88 NBR M00101	15573	●
200	160	15	3,5	5,5	T200.0-7	88 NBR M00101	15613	●
220	170	20	4	5,5	T220.0-1	88 NBR M00101	15632	○
225	185	20	5	5,5	T225.0-3	88 NBR M00101	15637	○
270	180	22	5	6,5	T270.0-1	88 NBR M00101	15672	○
400	354	25	4	8	T400.0-1	88 NBR M00101	15736	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Cup Packing T without Spring

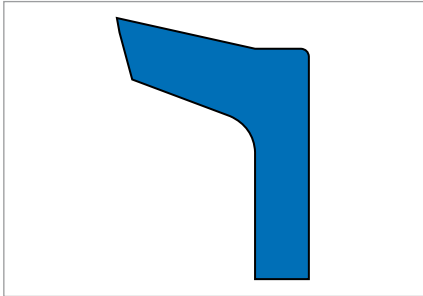


Fig. 1 Merkel Cup Packing T without Spring

Product description

Lip seal. Clamping flange for axial fixing in the housing.

Product advantages

Single-acting piston seal for secondary applications and for spare parts requirement.

Application

Standard cylinders.

Material

Sealing component

Material	Code	Hardness
Nitrile rubber NBR	88 NBR 101	88 Shore A

Operating conditions

Material	88 NBR 101
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Pressure p in MPa	1
Running speed v in m/s	0,5

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 μm	≤2,5 μm
Groove base	≤1,6 μm	≤6,3 μm
Groove flanks	≤3,0 μm	≤15,0 μm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. $x_2 \leq 0,5$. → Technical Manual.

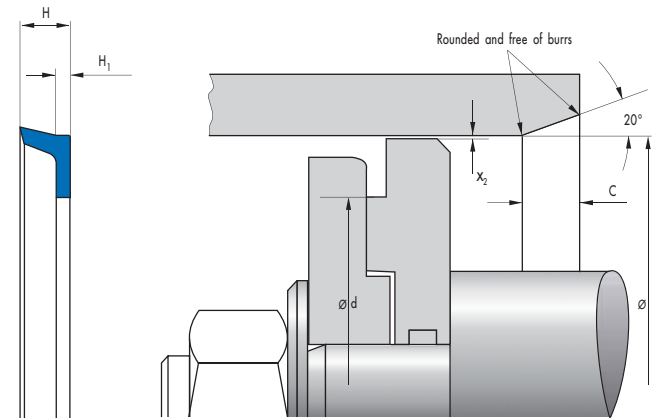
Tolerance recommendation

Nominal \varnothing D	D	d
≤ 550	H11	h10

Fitting & installation

The axial compression of the flange should be max. 10% of its thickness. Torque limiting is to be used. The metal clamping parts must not apply any force to the transition zone from clamping flange to sealing lip. To improve the fixing of the cup packing and sealing effect on the flat clamping side, the turning of one or two sealing grooves is recommended.

Article list

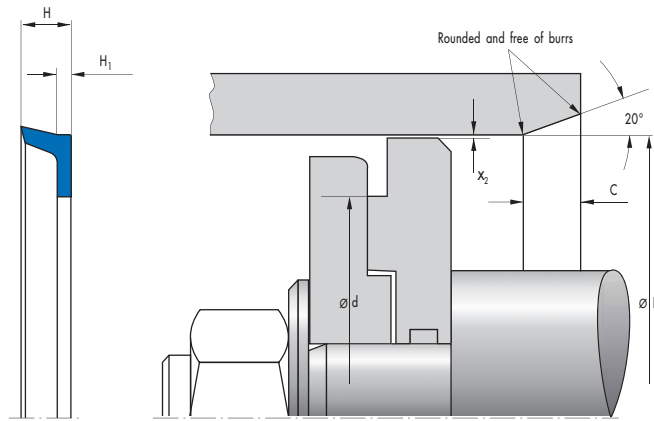


D	d	H	H ₁	C	Code	Material	Article No.	
10	4	3	1	3	T10.0-3	88 NBR M00101	14689	○
11	4	8	1,5	3	T11.0-1	88 NBR M00101	14701	○
12	0	8	4	3	T12.0-15	88 NBR M00101	14715	●
12	3	6	1,5	3	T12.0-11	88 NBR M00101	14712	○
12	4	6	2	3	T12.0-5	88 NBR M00101	14708	○
13	0	6	2	3	T13.0-3	88 NBR M00101	14721	○
14	0	8	4	3	T14.0-3	88 NBR M00101	14727	○
14	5	8	2	3	T14.0-2	88 NBR M00101	13336	○
14	6	5	1,5	3	T14.0-4	88 NBR M00101	14728	●
15	6	5	1,5	3	T15.0-3	88 NBR M00101	14732	●
15	6	7	3	3	T15.0-1	88 NBR M00101	14730	○
16	0	6	2	3	T16.0-3	88 NBR M00101	14748	○
16	7	6,5	2	3	T16.0-1	88 NBR M00101	14746	●
17	6,5	5,5	1,5	3	T17.0-2	88 NBR M00101	14753	○
17	8	7	1,5	3	T17.0-8	88 NBR M00101	14759	●
18	5	5	2	3	T18.0-2	88 NBR M00101	14762	●
18	5	7	3	3	T18.0-1	88 NBR M00101	14761	●
19	0	6	2	3	T19.0-1	88 NBR M00101	14773	○
20	8	5	1,5	3	T20.0-8	88 NBR M00101	14780	○
20	8	6,5	3	3	T20.0-4	88 NBR M00101	14779	●
20	10	5	2	3	T20.0-3	88 NBR M00101	14778	●
20	10	8	2,5	3	T20.0-10	88 NBR M00101	14781	●
22	6	7	2	3	T22.0-1	88 NBR M00101	14794	●
22	9	7,5	2,5	3	T22.0-2	88 NBR M00101	14795	●
24	12,8	7	2	3	T24.0-4	88 NBR M00101	14811	○
25	0	7	3	3	T25.0-8	88 NBR M00101	14821	●
25	8	6	1,5	3	T25.0-9	88 NBR M00101	14822	●
25	9	8	2,5	3	T25.0-5	88 NBR M00101	14819	●
25	12	7	2,5	3	T25.0-10	88 NBR M00101	14823	●
25	15	5	1,5	3	T25.0-1	88 NBR M00101	14817	●
25	16,2	6	2	3	T25.0-2	88 NBR M00101	14818	○
25,4	0	5	1,5	3	T25.4-14	88 NBR M00101	14843	●
26	0	7	2,5	3	T26.0-2	88 NBR M00101	14848	●
26	8,2	8	2,2	3	T26.0-1	88 NBR M00101	14847	●
27	11	8	3	3	T27.0-5	88 NBR M00101	14860	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	H ₁	C	Code	Material	Article No.	
28	16	6	1,5	3	T28.0-1	88 NBR M00101	14865	●
28	16	8	2,5	3	T28.0-5	88 NBR M00101	14868	○
30	8	8	2,5	3	T30.0-11	88 NBR M00101	14885	○
30	8	17	3	3	T30.0-8	88 NBR M00101	14883	○
30	10	6	2	3	T30.0-9	88 NBR M00101	14884	○
30	10	10	2,5	3	T30.0-18	88 NBR M00101	14890	●
30	14	6	2	3	T30.0-13	88 NBR M00101	14887	●
31	8	8	2	3	T31.0-5	88 NBR M00101	14901	○
32	6,2	11,5	1,8	3	T32.0-15	88 NBR M00101	14917	●
32	16	8	2,5	3	T32.0-2	88 NBR M00101	14907	●
32	18	7	2	3	T32.0-16	88 NBR M00101	14918	●
34	18	10	3	3	T34.0-2	88 NBR M00101	14928	○
35	0	9	2,5	3	T35.0-8	88 NBR M00101	14942	●
35	10	8	2,5	3	T35.0-3	88 NBR M00101	14937	○
35	10	12	3	3	T35.0-9	88 NBR M00101	14943	●
35	14	10	4	3	T35.0-14	88 NBR M00101	14947	○
35	17	6	1,5	3	T35.0-10	88 NBR M00101	14944	○
35	21	8	2,5	3	T35.0-7	88 NBR M00101	14941	●
36	18	6	2	3	T36.0-1	88 NBR M00101	14954	○
37	26	7	1,5	3	T37.0-1	88 NBR M00101	14966	○
38	12	8	2,5	3	T38.0-1	88 NBR M00101	14969	○
38	16	8	2,5	3	T38.0-3	88 NBR M00101	14970	●
38,1	0	9,4	3	3	T38.1-6	88 NBR M00101	14984	●
40	0	6	2	3	T40.0-10	88 NBR M00101	14995	●
40	13	13	4	3	T40.0-15	88 NBR M00101	14999	●
40	16	10	2	3	T40.0-16	88 NBR M00101	15000	●
40	18	6	2	3	T40.0-8	88 NBR M00101	14994	●
40	21	9	3	3	T40.0-14	88 NBR M00101	14998	●
40	24	8	2	3	T40.0-22	88 NBR M00101	15004	○
41	18	18	5	3	T41.0-2	88 NBR M00101	15018	○
42	16,2	6	2	3	T42.0-1	88 NBR M00101	15021	●
42	25	13	2,5	3	T42.0-3	88 NBR M00101	15022	●
43	15	10	3	3	T43.0-2	88 NBR M00101	15027	●
45	20	10	3	3	T45.0-11	88 NBR M00101	15045	●
45	22	14	4	3	T45.0-1	88 NBR M00101	15038	○
45	26,5	18	3	3	T45.0-10	88 NBR M00101	15044	○
45	27	10	2,5	3	T45.0-13	88 NBR M00101	15047	●
45	30	6	1,5	3	T45.0-14	88 NBR M00101	15048	○
46	0	10	2	3	T46.0-5	88 NBR M00101	15061	○
46	11	9	1,5	3	T46.0-3	88 NBR M00101	15059	●
46	27	11	3,5	3	T46.0-4	88 NBR M00101	15060	○
48	30	9	2,5	3	T48.0-2	88 NBR M00101	15076	●
50	0	15	4,5	3	T50.0-25	88 NBR M00101	15101	●
50	6	7	2	3	T50.0-21	88 NBR M00101	15097	●
50	8	12	3	3	T50.0-9	88 NBR M00101	15088	○
50	12	10	2,5	3	T50.0-14	88 NBR M00101	15092	○
50	16	19	4	3	T50.0-10	88 NBR M00101	15089	○
50	18	10	2	3	T50.0-20	88 NBR M00101	15096	●
50	25	12	3	3	T50.0-23	88 NBR M00101	15099	●
50	28	7	2	3	T50.0-18	88 NBR M00101	15094	○

● Available from stock ○ On request: Tool is available, delivery at short notice

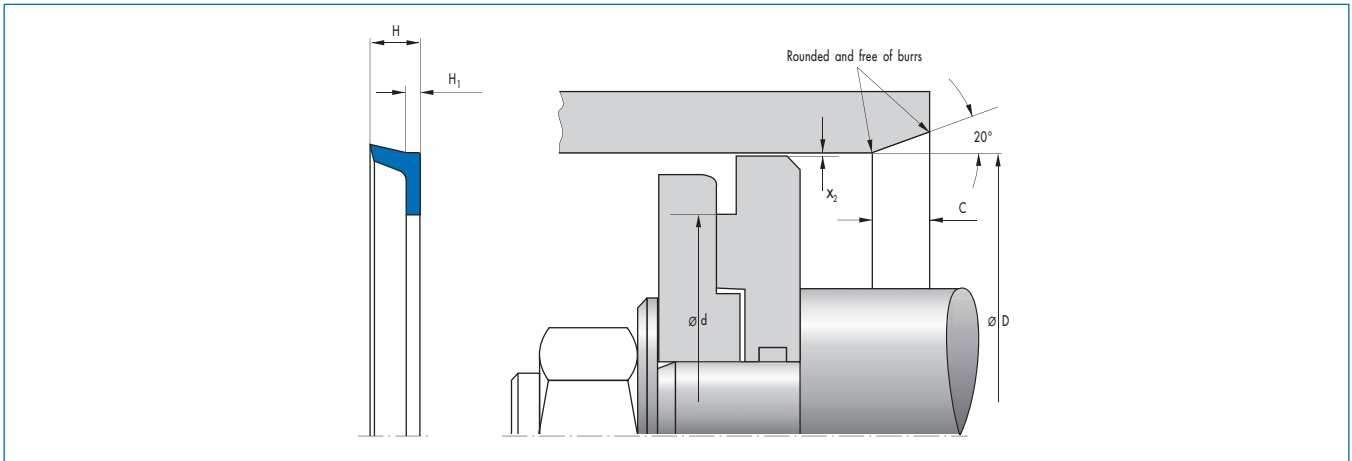


D	d	H	H ₁	C	Code	Material	Article No.	
50	28	12	3	3	T50.0-35	88 NBR M00101	15105	○
50	32	7	2	3	T50.0-2	88 NBR M00101	15083	●
50	36	7	2	3	T50.0-11	88 NBR M00101	15090	○
50	38	6	1,5	3	T50.0-22	88 NBR M00101	15098	○
52	20	8	2,5	3	T52.0-2	88 NBR M00101	15122	○
54	16	16	4	3	T54.0-1	88 NBR M00101	15125	○
55	12	20	5	3	T55.0-3	88 NBR M00101	15130	○
55	13	15	4	3	T55.0-12	88 NBR M00101	15139	●
55	16	10	3	3	T55.0-1	88 NBR M00101	15129	●
55	18	10	2	3	T55.0-10	88 NBR M00101	15137	●
55	36	10	3,2	3	T55.0-21	88 NBR M00101	15146	●
58	32	14	4	3	T58.0-6	88 NBR M00101	15161	○
59	17	20	4	3	T59.0-1	88 NBR M00101	15163	○
60	0	16	4	3	T60.0-28	88 NBR M00101	15183	●
60	16	11	3	3	T60.0-11	88 NBR M00101	15171	○
60	25	20	3	3	T60.0-5	88 NBR M00101	15166	○
60	30	13	3	3	T60.0-31	88 NBR M00101	15185	○
60	40,5	8	2,5	3	T60.0-1	88 NBR M00101	15164	○
60	42	8	2,5	3	T60.0-20	88 NBR M00101	13392	○
60	49,5	12	3	3	T60.0-23	88 NBR M00101	15180	○
62	40	12	3	3	T62.0-6	88 NBR M00101	15197	○
65	0	18	4	3,5	T65.0-23	88 NBR M00101	15223	○
65	16	20	3	3,5	T65.0-3	88 NBR M00101	15207	○
65	25	12	3,5	3,5	T65.0-18	88 NBR M00101	15219	○
65	35,2	13	4	3,5	T65.0-9	88 NBR M00101	15212	○
66	16	16	3	3,5	T66.0-2	88 NBR M00101	15229	○
68	35	10	3	3,5	T68.0-3	88 NBR M00101	15237	○
70	12	13	3	3,5	T70.0-16	88 NBR M00101	15248	○
70	20	13	3,5	3,5	T70.0-22	88 NBR M00101	15252	○
70	20	15	3	3,5	T70.0-11	88 NBR M00101	15243	○
70	22	9	2	3,5	T70.0-17	88 NBR M00101	15249	●
70	35	10	3	3,5	T70.0-23	88 NBR M00101	15253	○
70	40	13	2,5	3,5	T70.0-13	88 NBR M00101	15245	●
70	44	12	3,5	3,5	T70.0-8	88 NBR M00101	15241	○
70	50	8	2,5	3,5	T70.0-12	88 NBR M00101	15244	○
75	25	15	3	3,5	T75.0-2	88 NBR M00101	15276	●
75	53	15	4	3,5	T75.0-8	88 NBR M00101	15282	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	H	H ₁	C	Code	Material	Article No.	
76	20	16	3	4	T76.0-1	88 NBR M00101	15287	●
78	40	15	4	4	T78.0-1	88 NBR M00101	15291	○
80	0	20	4	4	T80.0-33	88 NBR M00101	15318	●
80	42	13	3,5	4	T80.0-21	88 NBR M00101	15310	○
80	50	10	2,5	4	T80.0-17	88 NBR M00101	15307	●
80	52	8,5	3	4	T80.0-3	88 NBR M00101	15295	○
82	42	15,8	4,5	4	T82.0-1	88 NBR M00101	15812	○
85	45	14	2,5	4	T85.0-7	88 NBR M00101	15336	○
90	35,1	18	4	4	T90.0-2	88 NBR M00101	15345	○
90	62	18	4	4	T90.0-17	88 NBR M00101	15358	●
90	65	12	3	4	T90.0-12	88 NBR M00101	15354	●
95	38	15	3,5	4	T95.0-6	88 NBR M00101	15377	○
100	0	22	4	4	T100.0-23	88 NBR M00101	15402	○
100	28	18	4	4	T100.0-4	88 NBR M00101	15383	○
100	42	18	4	4	T100.0-8	88 NBR M00101	15387	●
100	60	15	3	4	T100.0-19	88 NBR M00101	15398	●
100	64	12	3	4	T100.0-35	88 NBR M00101	15413	○
100	65	10	3	4	T100.0-9	88 NBR M00101	15388	○
100	68	15	4	4	T100.0-28	88 NBR M00101	15409	○
100	78	12	3	4	T100.0-10	88 NBR M00101	15389	○
102	21	21	3	4	T102.0-1	88 NBR M00101	15422	●
105	80	12	3	4	T105.0-1	88 NBR M00101	15424	●
110	70	15	3	4	T110.0-1	88 NBR M00101	15433	●
115	76	11	3	4	T115.0-2	88 NBR M00101	15452	●
120	30	14	4	4	T120.0-10	88 NBR M00101	15465	○
120	30	20	3	4	T120.0-7	88 NBR M00101	15463	○
120	76	20	3	4	T120.0-1	88 NBR M00101	15458	○
120	99	14	3	4	T120.0-5	88 NBR M00101	15461	●
125	88	18	3,5	5,5	T125.0-12	88 NBR M00101	15483	●
130	43	23	5	5,5	T130.0-3	88 NBR M00101	15503	○
130	105	12	3	5,5	T130.0-4	88 NBR M00101	15504	○
140	30	20	4	5,5	T140.0-11	88 NBR M00101	15527	●
140	50	15	3	5,5	T140.0-8	88 NBR M00101	15523	○
140	92	28	3	5,5	T140.0-3	88 NBR M00101	15518	○
140	120	16	3	5,5	T140.0-10	88 NBR M00101	15526	○
145	100	15	3	5,5	T145.0-1	88 NBR M00101	15534	●
150	35	25	4	5,5	T150.0-3	88 NBR M00101	13457	○
150	120,5	16	4	5,5	T150.0-5	88 NBR M00101	15542	○
155	80	24	5	5,5	T155.0-2	88 NBR M00101	15554	○
160	80	24	5	5,5	T160.0-1	88 NBR M00101	15557	○
160	110	15	3,5	5,5	T160.0-5	88 NBR M00101	15561	○
175	115	18	4	5,5	T175.0-2	88 NBR M00101	15576	○
175	140,5	17	4	5,5	T175.0-3	88 NBR M00101	15577	○
180	130	15	4	5,5	T180.0-1	88 NBR M00101	15582	○
180	140	20	5	5,5	T180.0-4	88 NBR M00101	15585	○
190	145	21,5	6,5	5,5	T190.0-4	88 NBR M00101	15600	○
200	102	30	4	5,5	T200.0-4	88 NBR M00101	15610	○
200	130	24	5	5,5	T200.0-5	88 NBR M00101	15611	○
200	150	20	5	5,5	T200.0-2	88 NBR M00101	15608	○
200	162	17	3	5,5	T200.0-1	88 NBR M00101	15607	●

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d	H	H ₁	C	Code	Material	Article No.	
240	170	20,5	4,5	5,5	T240.0-1	88 NBR M00101	15642	○
250	210	20	5	5,5	T250.0-1	88 NBR M00101	15646	○
315	270	25	5	8	T315.0-1	88 NBR M00101	15701	○
320	240	25	5	8	T320.0-2	88 NBR M00101	15703	○
350	300	25	5	8	T350.0-1	88 NBR M00101	15720	○
450	380	20	8	8	T450.0-1	88 NBR M00101	15753	○
450	410	24	4	8	T450.0-2	88 NBR M00101	15754	○
475	412	30	5	8	T475.0-1	88 NBR M00101	15759	○
500	431	24	5	8	T500.0-1	88 NBR M00101	15765	○
550	510	27	4	8	T550.0-1	88 NBR M00101	15776	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Chevron Seal Set EK, EKV

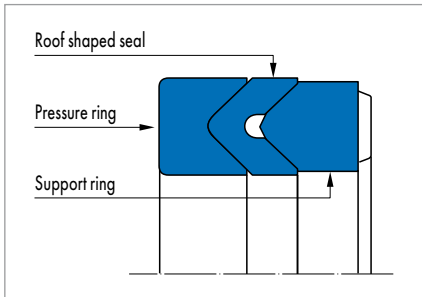


Fig. 1 Merkel Chevron Seal Set EK, EKV

Product description

Multi-part Merkel Chevron Seal Set comprising one thrust ring, one or two seals and a back-up ring.

Product advantages

Seal set for robust operating conditions, predominantly the provision of spare parts for older plant. Merkel Chevron Seal Set EK, EKV can be used for pistons with pressure on one side or "back to back" for pistons with pressure on both sides

- Proven under extreme conditions
- High durability
- Can be optimally adjusted to the related application
- Functions over a certain time period even with poorer surfaces
- Insensitive to soiling
- For application and design related reasons, fluctuations in the leakage behaviour and in the friction behaviour are to be expected.

Application

Injection moulding machines, presses, marine hydraulics, scrap cutters, iron and steel industry, special cylinders, steel hydraulics, engineering.

Material

Pressure ring

Material	Code
Cotton fabric/FKM	BI-FKM
Cotton fabric/FKM	BI-NBR B259

Roof-shaped seal

Material	Code
Cotton fabric/FKM	BI-NBR
Cotton fabric/FKM	BI-FKM

Rubber fabric roof-shaped seal

Material	Code	Hardness
Cotton fabric/FKM	85 NBR	85 FKM (EKV)
Cotton fabric/FKM	85 Shore A	85 Shore A

Back-up ring

Material	Code
Cotton fabric/NBR	BI-NBR
Cotton fabric/FKM	BI-FKM
Polyacetal POM	POM

Operating conditions

Material	BI-NBR / 85 NBR	BI-FKM / 85 FKM
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-15 ... +140
HFA fluids	+5 ... +60	+5 ... +60
HFB fluids	+5 ... +60	+5 ... +60
HFC fluids	-30 ... +60	-15 ... +60
HFD fluids	-	-15 ... +140
Water	+5 ... +100	+5 ... +80
HETG (rapeseed oil)	-30 ... +80	-15 ... +80
HEES (synthetic esters)	-30 ... +80	-15 ... +100
HEPG (glycol)	-30 ... +60	-15 ... +80
Mineral greases	-30 ... +100	-15 ... +140
Pressure p in MPa	40	
Running speed v in m/s	0,5	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_p >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Nominal Ø D	d
≤80	H9/f8
>80 ... 120	H8/f8
>120 ... 500	H8/f7
> 500 ... 630	H8/f7
>630 ... 800	H8/f7
> 800 ... 1000	H8/f7
>1000 ... 1250	H8/f7

Tolerance recommendation

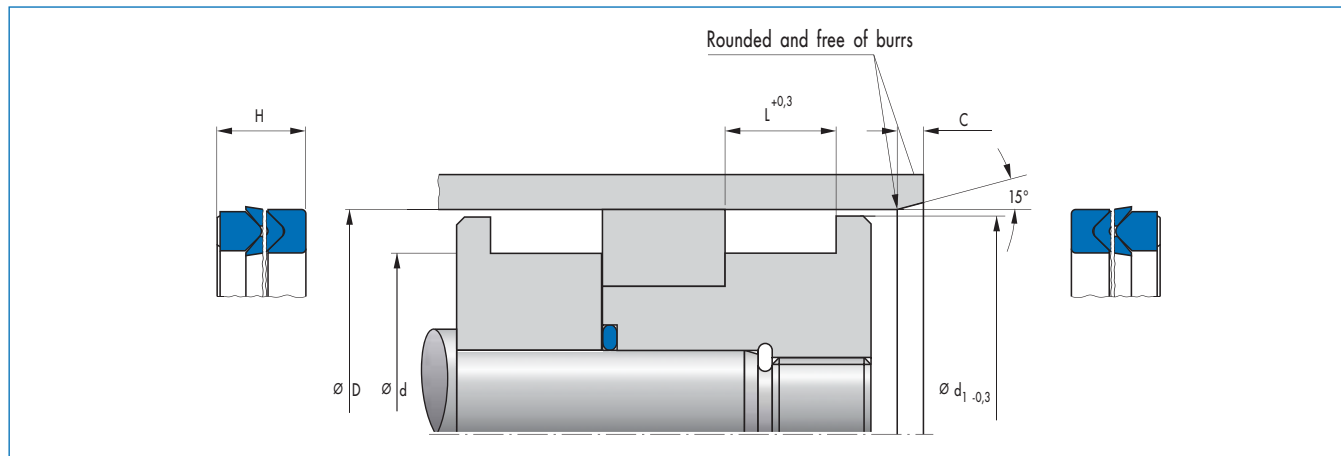
Nominal Ø D	D	d ₁
≤500	H11	-0,3
>500	H10	-0,3

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.

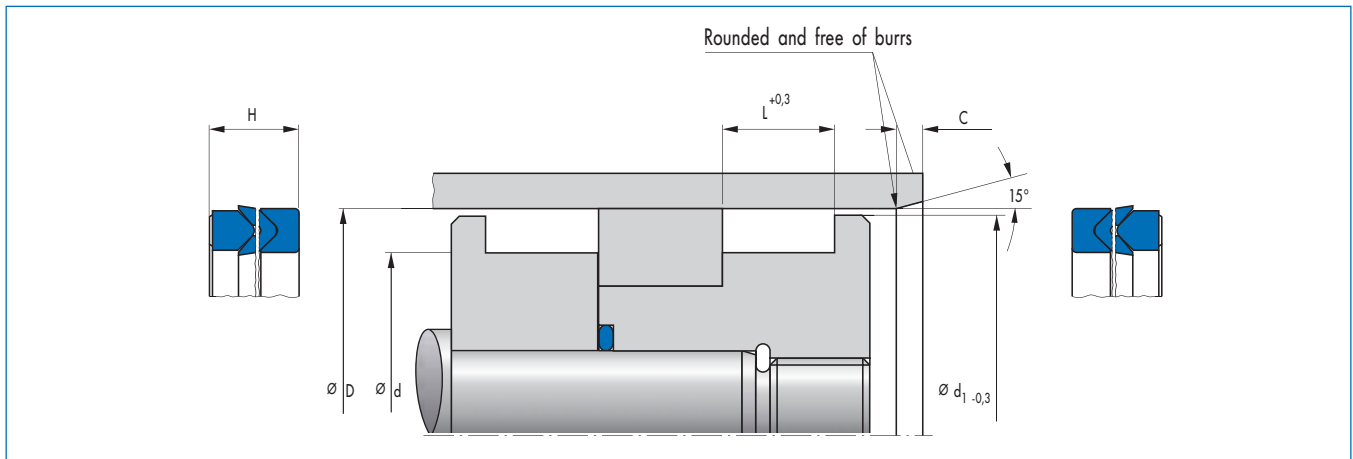
→ Technical Manual.

Article list



D	d	d ₁	L	H	Profile	C	Material	Type	Article No.	
40	25	39	11,5	11	7,5	5	BI-N B3B246	EK	24070153	●
40	25	39	11,5	11	7,5	5	BI-F B3K674	EKV	24101339	●
45	30	44	11,5	11	7,5	5	BI-N B3B246	EK	24070155	○
45	30	44	11,5	11	7,5	5	BI-F B3K674	EKV	24148048	○
50	35	49	11,5	11	7,5	5	BI-N B3B246	EK	24070156	●
50	35	49	11,5	11	7,5	5	BI-F B3K674	EKV	24139300	●
55	40	54	11,5	11	7,5	5	BI-N B3B246	EK	24070157	○
55	40	54	11,5	11	7,5	5	BI-F B3K674	EKV	24148049	○
56	41	55	11,5	11	7,5	5	BI-N B3B246	EK	24070158	○
56	41	55	11,5	11	7,5	5	BI-F B3K674	EKV	24148050	○
60	45	59	11,5	11	7,5	5	BI-N B3B246	EK	24070159	●
60	45	59	11,5	11	7,5	5	BI-F B3K674	EKV	24139297	○
63	48	62	12,5	12	7,5	5	BI-N B3B246	EK	24076835	○
63	48	62	13	12,5	7,5	5	BI-N B3B246	EK	24070160	●
63	48	62	13	12,5	7,5	5	BI-F B3K674	EKV	24139361	●
65	50	64	13	12,5	7,5	5	BI-N B3B246	EK	24138932	○
70	50	69	15,2	14,6	10	6	BI-N B4B246	EK	24070161	●
70	50	69	15,2	14,6	10	6	BI-F B4K674	EKV	24139314	○
80	60	79	15,2	14,6	10	6	BI-N B4B246	EK	24070162	●
80	65	79	12,5	12	7,5	5	BI-F B3K674	EKV	24248122	○
90	70	89	21,2	20,6	10	6	BI-N B4B246	EK	24070163	●
90	70	89	21,2	20,6	10	6	BI-F B4K674	EKV	24148051	○
100	80	99	21,2	20,6	10	6	BI-N B4B246	EK	24070164	●
100	80	99	21,2	20,6	10	6	BI-F B4K674	EKV	24139296	●
100	85	99	12,5	12	7,5	6	BI-N B3B246	EK	24073568	○
110	90	109	21,2	20	10	6	BI-N B4B246	EK	24070165	●
110	90	109	21,2	20,6	10	6	BI-F B4K674	EKV	24144307	○
115	95	114	21,2	20,6	10	6	BI-N B4B246	EK	24070166	●
115	95	114	21,2	20,6	10	6	BI-F B4K674	EKV	24148052	○
120	95	119	25,3	24,5	12,5	7,5	BI-N B4B246	EK	24071344	●
125	100	124	25,8	25	12,5	7,5	BI-N B4B246	EK	24070167	●
125	100	124	25,8	25	12,5	7,5	BI-F B4K674	EKV	24099512	●
140	115	139	25,8	25	12,5	7,5	BI-N B4B246	EK	24070168	●
140	115	139	25,8	25	12,5	7,5	BI-F B4K674	EKV	24139362	●
150	120	148,5	29	28	15	7,5	BI-N B4B246	EK	24070169	●

● Available from stock ○ On request: Tool is available, delivery at short notice

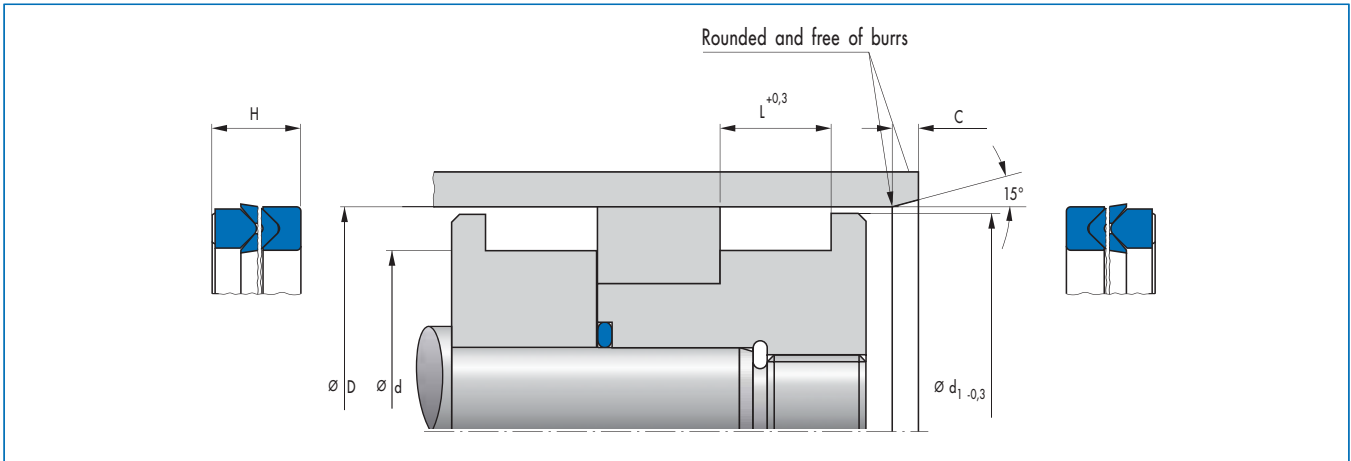


D	d	d ₁	L	H	Profile	C	Material	Type	Article No.	
150	120	148,5	29	28	15	7,5	BI-F B4K674	EKV	24144511	○
160	130	158,5	29	28	15	7,5	BI-N B4B246	EK	24070170	●
160	130	158,5	29	28	15	7,5	BI-F B4K674	EKV	24099516	●
180	150	178,5	31,5	30,5	15	7,5	BI-N B4B246	EK	24070171	●
180	150	178,5	31,5	30,5	15	7,5	BI-F B4K674	EKV	24139365	●
200	170	198,5	33,5	32,5	15	7,5	BI-N B4B246	EK	24266531	●
200	170	198,5	33,5	32,5	15	7,5	BI-F B4K674	EKV	24139359	●
200	170	198,5	38,7	37,5	15	7,5	BI-N B4B246	EK	24079621	○
220	190	218,5	33,5	32,5	15	7,5	BI-N B4B246	EK	24085858	●
220	190	218,5	38,7	37,5	15	7,5	BI-N B4B246	EK	24199656	●
225	195	223,5	33,5	32,5	15	7,5	BI-N B4B246	EK	24266533	●
225	195	223,5	33,5	32,5	15	7,5	BI-F B4K674	EKV	24148053	○
225	195	223,5	38,7	37,5	15	7,5	BI-N B4B246	EK	24075180	○
240	210	238,5	33,5	32,5	15	7,5	BI-N B4B246	EK	24121200	○
240	210	238,5	38,7	37,5	15	7,5	BI-N B4B246	EK	24102695	○
250	220	248,5	25	24	15	7,5	BI-N B4B246	EK	24248388	○
250	220	248,5	33,5	32,5	15	7,5	BI-N B4B246	EK	24149616	●
250	220	248,5	33,5	32,5	15	7,5	BI-F B4K674	EKV	24139363	●
250	220	248,5	38,7	37,5	15	7,5	BI-N B4B246	EK	24220077	●
260	230	258,5	33,5	32,5	15	7,5	BI-N B4B246	EK	24266547	○
260	230	258,5	38,7	37,5	15	7,5	BI-N B4B246	EK	24266548	○
280	250	278,5	33,5	32,5	15	7,5	BI-N B4B246	EK	24266549	●
280	250	278,5	33,5	30	15	7,5	BI-F B4K674	EKV	24182616	●
280	250	278,5	38,7	37,5	15	7,5	BI-N B4B246	EK	24063522	●
300	270	298,5	33,5	32,5	15	7,5	BI-N B4B246	EK	24266550	●
300	270	298,5	33,5	32,5	15	7,5	BI-F B4K674	EKV	24148055	○
300	270	298,5	38,7	37,5	15	7,5	BI-N B4B246	EK	24063954	●
310	280	308,5	33,5	32,5	15	7,5	BI-N B4B246	EK	24266551	○
310	280	308,5	38,7	37,5	15	7,5	BI-N B4B246	EK	24106772	○
320	280	318	41,5	40	20	7,5	BI-N B4B246	EK	24068630	●
320	280	318	51,8	50	20	7,5	BI-N B4B246	EK	24072341	○
320	290	318,5	33,5	32,5	15	7,5	BI-N B4B246	EK	24266552	●
320	290	318,5	38,7	37,5	15	7,5	BI-N B4B246	EK	24220080	○
340	300	338	41,5	40	20	10	BI-N B4B246	EK	24089867	○
340	300	338	51,8	50	20	10	BI-N B4B246	EK	24067213	○
340	310	338,5	33,5	32,5	15	7,5	BI-N B4B246	EK	24266553	○
340	310	338,5	38,7	37,5	15	7,5	BI-N B4B246	EK	24067366	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d	d ₁	L	H	Profile	C	Material	Type	Article No.	
350	310	348	41,5	40	20	10	BI-N B4B246	EK	24266554	○
350	310	348	51,8	50	20	10	BI-N B4B246	EK	24266555	○
360	320	358	41,5	40	20	10	BI-N B4B246	EK	24073186	●
360	320	358	51,8	50	20	10	BI-N B4B246	EK	24068309	○
380	340	378	41,5	40	20	10	BI-N B4B246	EK	24063739	●
380	340	378	51,8	50	20	10	BI-N B4B246	EK	24063609	●
390	350	388	41,5	40	20	10	BI-N B4B246	EK	24096917	○
390	350	388	51,8	50	20	10	BI-N B4B246	EK	24091905	○
400	360	398	41,5	40	20	10	BI-N B4B246	EK	24061431	●
400	360	398	51,8	50	20	10	BI-N B4B246	EK	24062353	○
410	370	407,5	41,5	40	20	10	BI-N B4B246	EK	24076734	○
410	370	407,5	51,8	50	20	10	BI-N B4B246	EK	24134434	○
420	380	417,5	41,5	40	20	10	BI-N B4B246	EK	24078766	○
420	380	417,5	51,8	50	20	10	BI-N B4B246	EK	24179322	○
440	400	437,5	41,5	40	20	10	BI-N B4B210	EK	24088254	○
440	400	437,5	51,8	50	20	10	BI-N B4B210	EK	24220081	○
450	410	447,5	41,5	40	20	10	BI-N B4B210	EK	24108468	●
450	410	447,5	51,8	50	20	10	BI-N B4B210	EK	24220082	○
460	420	457,5	41,5	40	20	10	BI-N B4B210	EK	24113757	○
460	420	457,5	51,8	50	20	10	BI-N B4B210	EK	24080149	○
480	440	477,5	41,5	40	20	10	BI-N B4B210	EK	24073599	○
480	440	477,5	51,8	50	20	10	BI-N B4B210	EK	24083862	○
490	450	487,5	41,5	40	20	10	BI-N B4B210	EK	24082627	○
490	450	487,5	51,8	50	20	10	BI-N B4B210	EK	24083228	○
500	460	497,5	41,5	40	20	10	BI-N B4B210	EK	24220083	○
500	460	497,5	51,8	50	20	10	BI-N B4B210	EK	24220084	○
510	470	507,5	41,5	40	20	10	BI-N B4B210	EK	24091197	○
510	470	507,5	51,8	50	20	10	BI-N B4B210	EK	24097617	○
520	480	517,5	41,5	40	20	10	BI-N B4B210	EK	24087936	○
520	480	517,5	51,8	50	20	10	BI-N B4B210	EK	24069860	○
540	500	537,5	41,5	40	20	10	BI-N B4B210	EK	24085075	○
540	500	537,5	64,5	50	20	10	BI-N B4B210	EK	24082317	○
550	510	547,5	41,5	40	20	10	BI-N B4B210	EK	24343760	○
550	510	547,5	51,8	50	20	10	BI-N B4B210	EK	24343761	○
560	510	557,5	51,8	50	25	12,5	BI-N B4B210	EK	24083477	○
560	510	557,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24082090	○
570	530	567,5	41,5	40	20	10	BI-N B4B210	EK	24287015	○
570	530	567,5	51,8	50	20	10	BI-N B4B210	EK	24214286	○
580	530	577,5	51,8	50	25	12,5	BI-N B4B210	EK	24113726	○
580	530	577,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24091357	○
580	540	577,5	41,5	40	20	10	BI-N B4B210	EK	24220085	○
580	540	577,5	51,8	50	20	10	BI-N B4B210	EK	24220086	○
590	550	587,5	51,8	50	20	10	BI-N B4B210	EK	24087597	○
600	560	597,5	41,5	40	20	10	BI-N B4B210	EK	24067724	○
600	560	597,5	51,8	50	20	10	BI-N B4B210	EK	24077886	○
610	560	607,5	51,8	50	25	12,5	BI-N B4B210	EK	24220087	○
610	560	607,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24099113	○
620	580	617,5	41,5	40	20	10	BI-N B4B210	EK	24090558	○
620	580	617,5	51,8	50	20	10	BI-N B4B210	EK	24170779	○
630	580	627,5	51,8	50	25	12,5	BI-N B4B210	EK	24141229	○

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d	d ₁	L	H	Profile	C	Material	Type	Article No.	
630	580	627,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24094418	○
630	590	627,5	41,5	40	20	10	BI-N B4B210	EK	24068741	○
630	590	627,5	51,8	50	20	10	BI-N B4B210	EK	24083633	○
640	600	637,5	51,8	50	20	10	BI-N B4B210	EK	24247385	○
650	600	647,5	51,8	50	25	12,5	BI-N B4B210	EK	24073080	○
650	600	647,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24082118	○
670	630	667,5	41,5	40	20	10	BI-N B4B210	EK	24074848	○
670	630	667,5	51,8	50	20	10	BI-N B4B210	EK	24074849	○
720	670	717,5	51,8	50	25	12,5	BI-N B4B210	EK	24181627	○
720	670	717,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24077483	○
730	690	727,5	51,8	50	20	10	BI-N B4B210	EK	24292823	○
740	700	737,5	41,5	40	20	10	BI-N B4B210	EK	24142521	○
740	700	737,5	51,8	50	20	10	BI-N B4B210	EK	24137458	○
750	710	747,5	41,5	40	20	10	BI-N B4B210	EK	24105848	○
750	710	747,5	51,8	50	20	10	BI-N B4B210	EK	24080694	○
760	710	757,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24339524	○
790	750	787,5	41,5	40	20	10	BI-N B4B210	EK	24220088	○
790	750	787,5	51,8	50	20	10	BI-N B4B210	EK	24149095	○
800	750	797,5	51,8	50	25	12,5	BI-N B4B210	EK	24068701	○
800	750	797,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24068702	○
840	800	837,5	41,5	40	20	10	BI-N B4B210	EK	24220089	○
840	800	837,5	51,8	50	20	10	BI-N B4B210	EK	24220090	○
850	800	847,5	51,8	50	25	12,5	BI-N B4B210	EK	24101686	○
850	800	847,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24085823	○
860	810	857,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24249193	○
870	820	867,5	51,8	50	25	12,5	BI-N B4B210	EK	24097782	○
870	820	867,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24137668	○
890	850	887,5	41,5	40	20	10	BI-N B4B210	EK	24143588	○
890	850	887,5	51,8	50	20	10	BI-N B4B210	EK	24218572	○
900	850	897,5	51,8	50	25	12,5	BI-N B4B210	EK	24181084	○
900	850	897,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24128505	○
950	900	947,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24081584	○
1000	950	997,5	51,8	50	25	12,5	BI-N B4B210	EK	24068742	○
1000	950	997,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24068704	○
1050	1000	1047,5	51,8	50	25	12,5	BI-N B4B210	EK	24311917	○
1050	1000	1047,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24069614	○
1100	1050	1097,5	64,5	62,5	25	12,5	BI-N B4B210	EK	24133469	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Forseal FOA made of PTFE

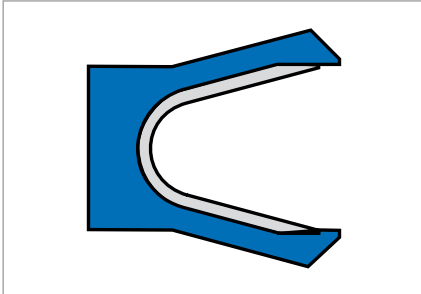


Fig. 1 Forseal FOA made of PTFE

Product description

Single acting, U-ring type PTFE seal with metal tension spring.

Product advantages

Axially moving piston seal, interchangeable for O-ring housings (ARP568, MIL-P-5514)

- Extremely resistant to media and temperature
- Good dry running properties
- Low static and dynamic friction values.

Application

Hot water valves, accumulators, hydraulic and pneumatic cylinders as well as applications in food processing, medical and chemical technology.

Design notes

Beside the default dimensions, all special dimensions considering the U-ring profiles are available on request without surcharge for the tool.
 Dimensions available from Ø 10 (piston) to approx. 2000 mm. In general, installation is only possible in split, axially accessible grooves. Installation in half-open grooves possible in exceptional cases. → Technical Manual.

Material

Material	Code	Tension spring
PTFE carbon-filled	PTFE 10/F56110	stainless steel (Material No. 1.4310)

Operating conditions

Material	PTFE 10/F56110 + 1.4310
Temperature range in °C	
Hydraulic oils, oil, water, steam, air, solvents, pharmaceutical goods, foodstuffs or all media that do not attack PTFE and stainless steel	-200 ... +260
Pressure p in MPa	30
Running speed v in m/s	15

Material	PTFE 10/F56110 +spring Hastelloy C276 (Not available ex-works)
Temperature range in °C	
Aggressive acids and alkalis	-200 ... +260
Pressure p in MPa	30
Running speed v in m/s	15

Turning-pivoting movements possible. No rotation. → Technical Manual.

Surface quality

Sealing surfaces, dynamic/static: → Fig. 2

Lead-in chamfers: $R_a < 1,6 \mu\text{m}$

Sides of groove: $R_a < 2,5 \mu\text{m}$

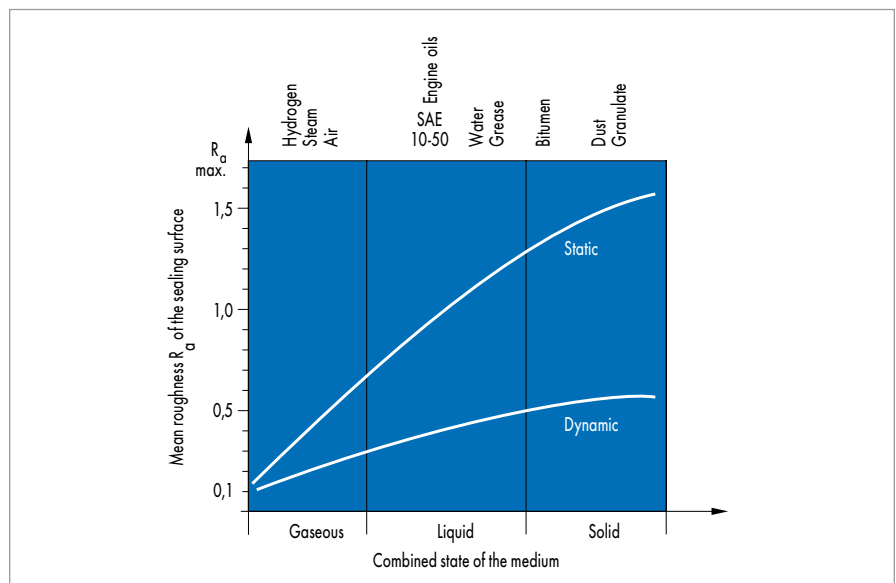
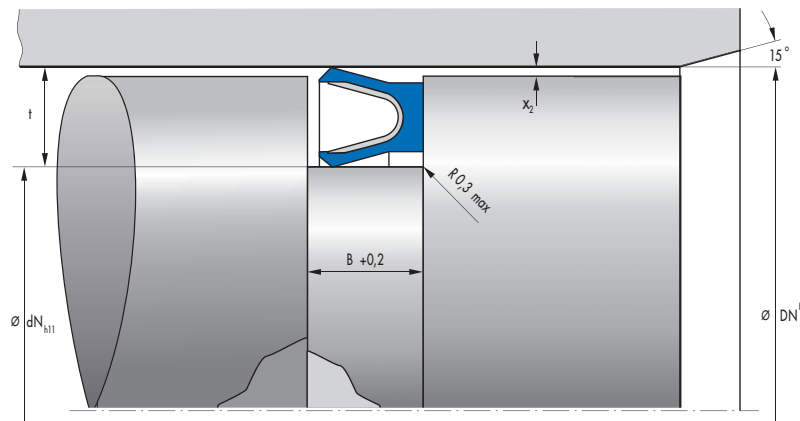


Fig. 2 Surface recommendation for sealing surfaces

Article list



D _N	d _N	h	t	x ₂ max	Interchangeable for O-Ring	B+0,2	Material	Article No.	
10	7,1	2,1	1,45	0,07	1,78	2,4	PTFE F56110	422091	●
12	9,1	2,1	1,45	0,07	1,78	2,4	PTFE F56110	435978	●
14	9,5	2,1	1,45	0,07	1,78	2,4	PTFE F56110	417777	○
16	11,5	3,2	2,25	0,08	2,62	3,6	PTFE F56110	372523	●
18	13,5	3,2	2,25	0,08	2,62	3,6	PTFE F56110	397780	●
20	15,5	3,2	2,25	0,08	2,62	3,6	PTFE F56110	366331	●
24	19,5	3,2	2,25	0,08	2,62	3,6	PTFE F56110	525886	○
25	20,5	3,2	2,25	0,08	2,62	3,6	PTFE F56110	366333	●
28	21,8	4,3	3,1	0,1	3,53	4,8	PTFE F56110	390784	●
30	23,8	4,3	3,1	0,1	3,53	4,8	PTFE F56110	366335	●
32	25,8	4,3	3,1	0,1	3,53	4,8	PTFE F56110	366336	●
35	28,8	4,3	3,1	0,1	3,53	4,8	PTFE F56110	371930	●
40	33,8	4,3	3,1	0,1	3,53	4,8	PTFE F56110	366337	●
42	35,8	4,3	3,1	0,1	3,53	4,8	PTFE F56110	434448	●
45	38,8	4,3	3,1	0,1	3,53	4,8	PTFE F56110	371448	●
48	38,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	422093	○
50	40,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366338	●
55	45,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	422322	●
56	46,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	422323	●
60	50,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366339	●
63	53,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366340	●
65	74,4	6,6	4,7	0,12	5,33	7,1	PTFE F56110	371445	●
70	60,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366341	●
75	65,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	422325	●
80	70,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366342	●
85	75,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	422327	○
90	80,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	422328	●
95	85,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	389792	●
100	90,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	366343	●
110	100	6,6	4,7	0,12	5,33	7,1	PTFE F56110	422331	●
120	110,6	6,6	4,7	0,12	5,33	7,1	PTFE F56110	162774	○
125	115	6,6	4,7	0,12	5,33	7,1	PTFE F56110	422333	●
130	117	9	6,1	0,15	7	9,5	PTFE F56110	434449	○
140	127	9	6,1	0,15	7	9,5	PTFE F56110	434451	●
150	137	9	6,1	0,15	7	9,5	PTFE F56110	373520	●

● Available from stock ○ On request: Tool is available, delivery at short notice

D _N	d _N	h	t	x _{2 max}	Interchangeable for O-Ring	B+0,2	Material	Article No.	
160	147,8	9	6,1	0,15	7	9,5	PTFE F56110	165069	●
170	157	9	6,1	0,15	7	9,5	PTFE F56110	422332	●
180	167	9	6,1	0,15	7	9,5	PTFE F56110	422335	●
190	177	9	6,1	0,15	7	9,5	PTFE F56110	405589	●
200	187	9	6,1	0,15	7	9,5	PTFE F56110	378166	●

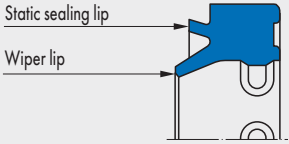
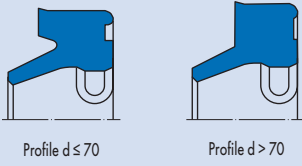
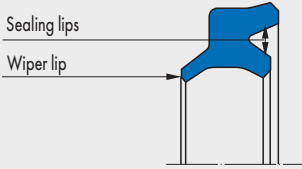
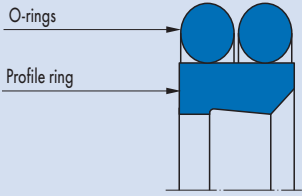
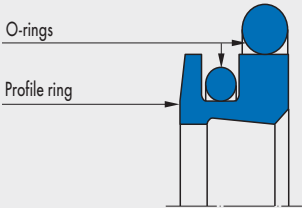
● Available from stock ○ On request: Tool is available, delivery at short notice

Pre-Selection Hydraulics – Wipers

Temperature figures refer to mineral oils. Due to the large choice of media with different and varying additives, which is not always easily comprehensible, the above operating limits are only recommended values. We recommend testing resistance in the specific case.

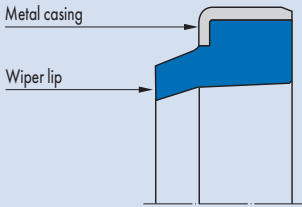
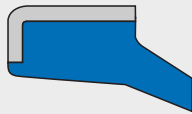

Individual instances of the operating limits stated may be exceeded taking into account the related operating conditions.

With a long duty cycle, stop-start operation or other difficult operating conditions it is recommended that these values are not simultaneously exploited to the full.

Seal		Standard	
Type	Material	DIN/ISO	Examples of use
<p>Merkel Wiper PU 5</p>  <p>Static sealing lip Wiper lip</p>	95 AU V149	6195 A	Optimal price/performance ratio, additional static sealing lip protects against drawing-in of dirt.
<p>Merkel Wiper PU 6</p>  <p>Profile d ≤ 70 Profile d > 70</p>	95 AU V149		High wear resistance, universally applicable with extra functions.
<p>Merkel Double Wiper PU 11</p>  <p>Sealing lips Wiper lip</p>	95 AU V149	6195 C	With additional sealing function.
<p>Merkel Double Wiper PT 1</p>  <p>O-rings Profile ring</p>	PTFE bronze NBR PTFE bronze FKM PTFE glass NBR		Stick-slip free operation, well suited for regulation and positioning tasks, high functional safety through additional sealing edge.
<p>Merkel Double Wiper PT 2</p>  <p>O-rings Profile ring</p>	PTFE bronze NBR PTFE bronze FKM		Outstanding regulation and positioning in operation, stick-slip free operation, specifically for large diameters and heavy duty hydraulic applications.

● = very good; ◐ = good; ○ = possible or satisfactory; ⊗ = not suitable

	Function					Operating Limits		
	single-acting	double-acting	Individual seal	Primary seal	Secondary seal	Pressure (MPa)	Speed (m/s)	Temperature (°C)
	●						2	-30 ... +110
	●						2	-30 ... +110
		●					1	-30 ... +110
		●					5	-30 ... +100
		●					5	-30 ... +100

Seal		Standard		
Type	Material	DIN/ISO	Examples of use	
<p>Merkel Wiper AUAS</p>  <p>Metal casing</p> <p>Wiper lip</p>	94 AU 925	6195 B	With metal-reinforced punched wiper lip.	
<p>Merkel Wiper AUAS R</p> 	94 AU 925	6195 B	With metal reinforcement radius on wiper lip.	
<p>Merkel Wiper AUPS</p> 	94 AU 925		With metal reinforcement, non-protruding wiper lip.	

● = very good; ◐ = good; ○ = possible or satisfactory; ⊗ = not suitable

	Function					Operating Limits		
	single-acting	double-acting	Individual seal	Primary seal	Secondary seal	Pressure (MPa)	Speed (m/s)	Temperature (°C)
	•						2	-30 ... +110
	•						2	-30 ... +110
	•						2	-30 ... +110

Merkel Wiper AS

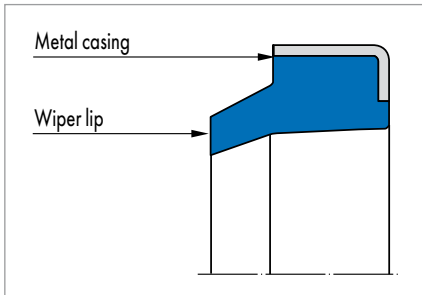


Fig. 1 Merkel Wiper AS

Product description

Dirt wiper with metal housing; wiper lip protruding.

Product advantages

Single-acting wiper for the protection of cylinders against ingress of dirt, use in standardised housings, amongst others, according to ISO 6195 Type B.

Application

Standard cylinders.

Material

Material	Hardness	Metal housing
Nitrile rubber NBR	88 Shore A	unalloyed steel

Operating conditions

Material	88 NBR
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Running speed v in m/s	2

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 µm	≤6,3 µm
Side of groove	≤3,0 µm	≤15,0 µm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	D _N
6 ... 400	H8

The tolerance for the Ø d_N is defined by the buffer seal.

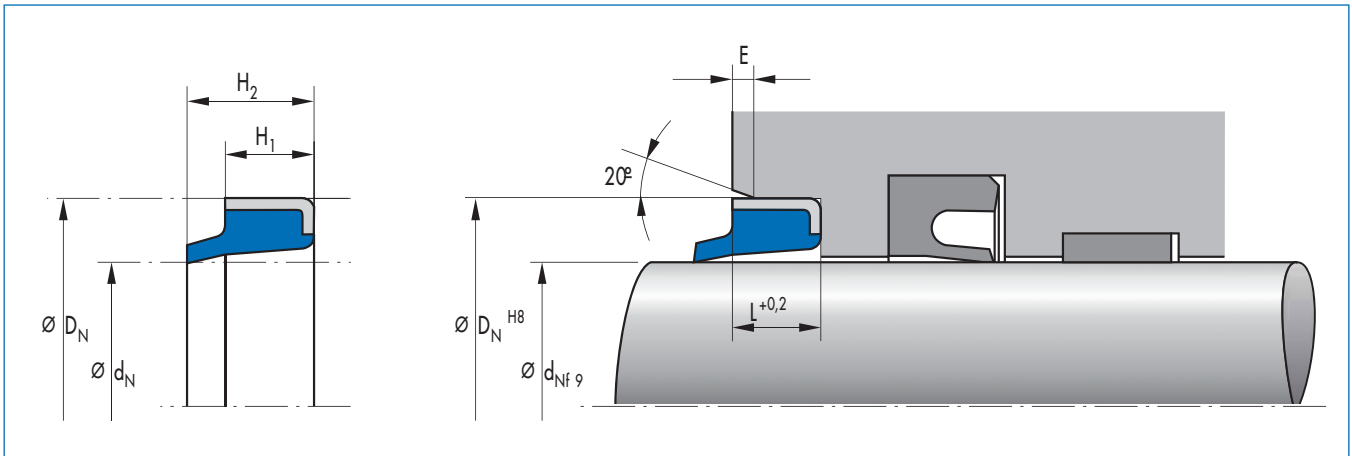
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

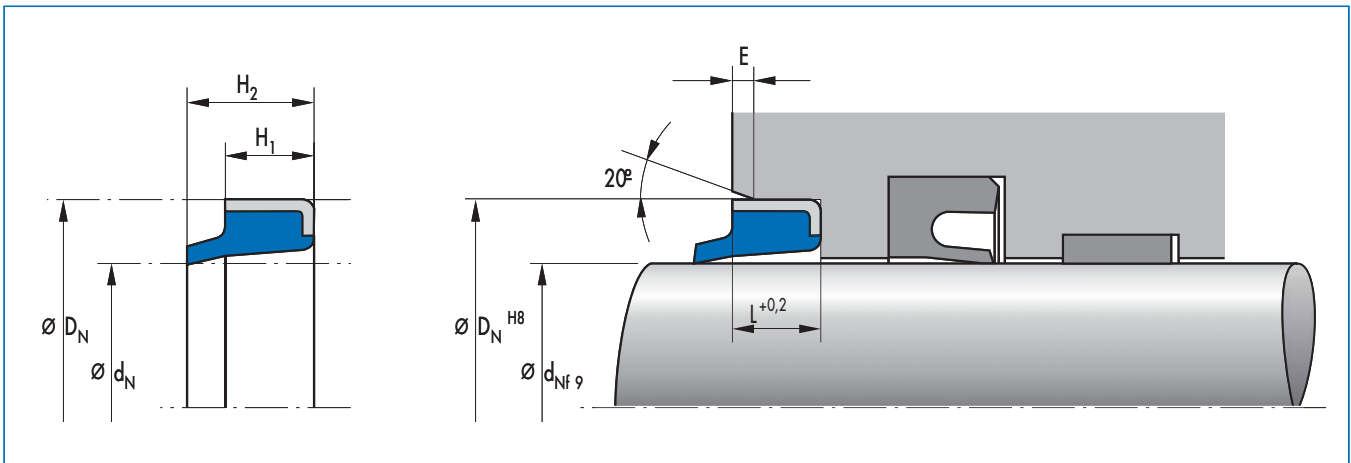
Careful fitting is a prerequisite for the correct function of the Merkel Wiper AS. Generally, wipers can be quickly and easily fitted by deforming into a kidney shape. → Technical Manual.

Article list



d	D	H ₁ / L	H	C	Housing	Material	Article No.	
6	13	3	4,5	0,3		88 NBR M00101	24801	●
8	22	3	4,5	0,3		88 NBR M00101	24802	●
10	16	3	4,5	0,3		88 NBR M99035	454478	●
10	20	5	8	0,7		88 NBR M00101	12654	●
12	18	3,5	5	0,4		88 NBR M99035	457403	●
12	20	4	6	0,4		88 NBR M99035	454486	●
12	22	5	8	0,7		88 NBR M00101	12655	●
14	22	3	4	0,3		88 NBR M00101	36550	●
15	25	5	8	0,7		88 NBR M00101	24805	●
16	22	3	4	0,3		88 NBR M99035	454489	●
16	22	3	4	0,3		88 NBR M99035	49006192	●
16	26	5	8	0,7		88 NBR M99035	454490	●
18	28	5	7	0,7		88 NBR M99035	454491	●
18	28	7	10	1	ISO	88 NBR M00101	12665	●
20	26	4	7	0,4		88 NBR M00101	101411	●
20	28	3,5	5	0,4		88 NBR M99035	454492	●
20	30	4	6	0,4		88 NBR M99035	454493	●
20	30	7	10	1	ISO	88 NBR M99035	454498	●
21	28	3,5	5,5	0,4		88 NBR M00101	24825	●
22	28	5	8	0,7		88 NBR M99035	454499	●
22	32	7	10	1	ISO	88 NBR M99035	454500	●
22	35	5	8	0,7		88 NBR M99035	454520	●
24	35	5	8	0,7		88 NBR M00101	24832	●
25	35	7	10	1	ISO	88 NBR M99035	454521	●
26	34	5	8	0,7		88 NBR M00101	24849	●
26	35	7	10	1		88 NBR M00101	37555	○
28	38	5	8	0,7		88 NBR M99035	454522	●
28	40	7	10	1		88 NBR M00101	33763	●
30	40	5	8	0,7		88 NBR M99035	454525	●
30	40	7	10	1		88 NBR M99035	454526	●
30	45	5	8	0,7		88 NBR M00101	24865	●
32	45	4	8	0,4		88 NBR M00101	24847	●
32	45	7	10	1		88 NBR M00101	12684	●
35	45	7	10	1		88 NBR M99035	454527	●
36	45	7	10	1		88 NBR M99035	454528	●

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H ₁ / L	H	C	Housing	Material	Article No.	
38	48	7	10	1		88 NBR M99035	464059	●
40	50	5	8	0,7		88 NBR M99035	454529	●
40	50	7	10	1	ISO	88 NBR M99035	454530	●
40	52	5	8	0,7		88 NBR M00101	38927	●
42	52	7	10	1		88 NBR M00101	24874	●
45	53,5	5	8	0,7		88 NBR M99035	454532	○
45	55	7	10	1	ISO	88 NBR M99035	454557	●
45	60	7	10	1		88 NBR M99035	454560	●
48	60	7	10	1		88 NBR M00101	12696	●
50	56	5	7	0,7		88 NBR M99035	454564	●
50	60	7	10	1	ISO	88 NBR M99035	454565	●
50	65	7	10	1		88 NBR M99035	454566	●
50	70	7	10	1		88 NBR M00101	39497	●
52	62	7	10	1		88 NBR M00101	12700	●
55	63	7	10	1		88 NBR M99035	454567	●
55	65	7	10	1		88 NBR M99035	454573	●
56	66	7	10	1	ISO	88 NBR M00101	6259	●
60	70	7	10	1		88 NBR M99035	454574	●
60	74	5	8	0,7		88 NBR M00101	24811	●
60	78	11	15	1		88 NBR M00101	24828	●
60	80	7	10	1		88 NBR M00101	45	●
63	75	7	10	1		88 NBR M00101	36267	●
65	75	7	10	1		88 NBR M99035	454620	●
70	80	7	10	1	ISO	88 NBR M99035	454575	●
75	83	7	10	1		88 NBR M00101	12713	○
75	85	7	10	1		88 NBR M99035	454576	●
80	90	7	10	1	ISO	88 NBR M99035	454577	●
80	100	12	15	1		88 NBR M00101	24845	●
85	95	7	10	1		88 NBR M00101	24813	●
90	100	7	10	1	ISO	88 NBR M99035	454578	●
95	105	7	10	1		88 NBR M99035	454579	●
100	110	7	10	1		88 NBR M99035	454580	●
105	115	7	10	1		88 NBR M00101	24816	●
110	120	7	10	1		88 NBR M99035	454582	●
115	125	7	10	1		88 NBR M00101	24817	●
120	130	7	10	1		90 NBR M00109	24819	●
125	140	9	12	1	ISO	88 NBR M00101	24831	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H ₁ / L	H	C	Housing	Material	Article No.	
130	145	9	12	1		88 NBR M00101	24872	●
135	145	7	10	1		88 NBR M00101	15034	●
140	155	9	12	1	ISO	88 NBR M00101	24855	●
145	160	9	12	1		88 NBR M00101	26971	●
150	165	9	12	1		88 NBR M00101	24862	●
160	175	9	12	1	ISO	88 NBR M00101	24876	●
170	185	10	14	1		88 NBR M00101	24822	●
180	195	10	14	1		88 NBR M00101	24823	●
190	202	9	12	1		88 NBR M00101	12741	○
190	220	9	12	1		88 NBR M00101	12742	○
200	220	12	16	1		88 NBR M00101	36009	●
210	230	12	16	1		88 NBR M00101	5312	○
220	240	12	16	1	ISO	88 NBR M00101	19574	●
240	260	12	16	1		88 NBR M00101	26972	●
260	290	12	16	1		88 NBR M00101	26975	○
270	295	12	16	1		88 NBR M00101	12745	○
320	340	12	16	1	ISO	88 NBR M00101	12747	○
400	420	12	16	1		88 NBR M00101	26976	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Wiper ASOB

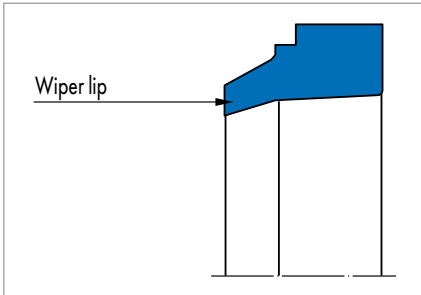


Fig. 1 Merkel Wiper ASOB

Product description

Dirt wiper with protruding wiper lip without metal reinforcement.

Product advantages

Single-acting wiper for the protection of cylinders against ingress of dirt.

Application

Standard cylinders.

Material

Material	Code	Hardness
Nitrile rubber NBR	88 NBR 101	88 Shore A

Operating conditions

Material	88 NBR 101
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +90
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Running speed v in m/s	2

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 μm	≤6,3 μm
Side of groove	≤3,0 μm	≤15,0 μm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	D	D ₁
8 ... 160	H11	H11

The tolerance for the Ø d is defined by the buffer seal.

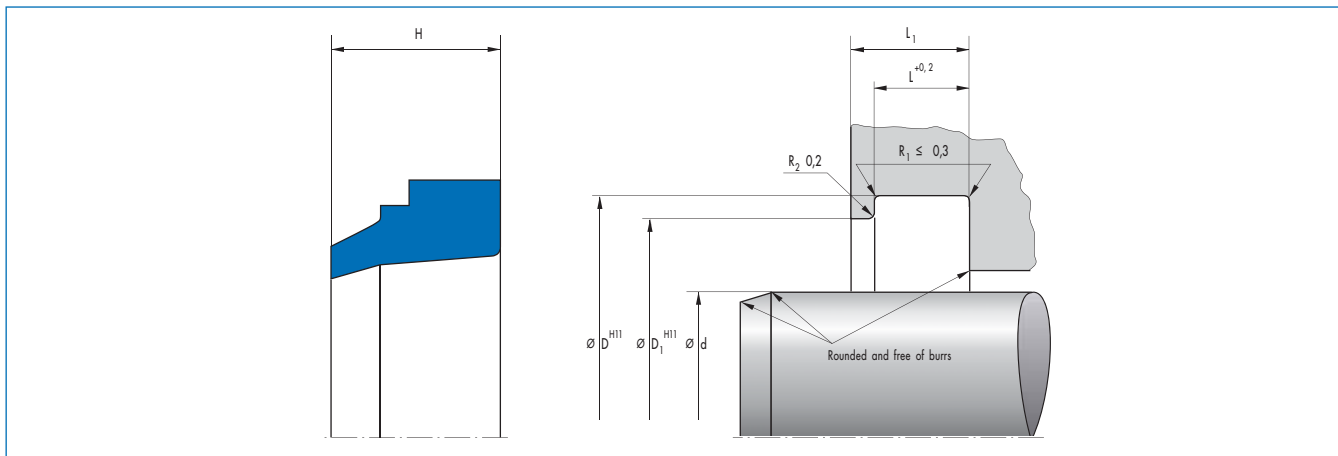
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the wiper. Merkel Wiper ASOB wipers can be quickly and easily fitted by deforming into a kidney shape. → Technical Manual.

Article list



d	D	L	H	D ₁	L ₁	Material	Article No.	
8	16	7	4	14	5	88 NBR M00101	401496	●
10	18	7	4	16	5	88 NBR M00101	401500	●
12	20	7	4	18	5	88 NBR M00101	361275	●
15	23	7	4	21	5	88 NBR M00101	401504	●
20	28	7	4	26	5	88 NBR M00101	86181	●
22	30	7	4	26	5	88 NBR M00101	86182	●
23	31	7	4	29	5	88 NBR M00101	401505	○
24	32	7	4	30	5	88 NBR M00101	407321	●
25	33	7	4	31	5	88 NBR M00101	86183	●
28	36	7	4	34	5	88 NBR M00101	86184	●
32	40	7	4	38	5	88 NBR M00101	86185	●
35	43	7	4	41	5	88 NBR M00101	316832	●
36	44	7	4	42	5	88 NBR M00101	86186	●
40	48	7	4	46	5	88 NBR M00101	86187	●
42	50	7	4	48	5	88 NBR M00101	401512	●
45	53	7	4	51	5	88 NBR M00101	86188	●
48	56	7	4	54	5	88 NBR M00101	401567	○
50	58	7	4	56	5	88 NBR M00101	86189	●
54	62	7	4	60	5	88 NBR M00101	401571	●
55	63	7	4	61	5	88 NBR M00101	407332	●
56	64	7	4	62	5	88 NBR M00101	86190	●
60	68	7	4	66	5	88 NBR M00101	8626	●
63	71	7	4	69	5	88 NBR M00101	86194	●
65	73	7	4	71	5	88 NBR M00101	385492	●
68	76	7	4	74	5	88 NBR M00101	401579	○
70	78	7	4	76	5	88 NBR M00101	86195	●
75	83	7	4	81	5	88 NBR M00101	407323	●
80	88	7	4	86	5	88 NBR M00101	86196	●
85	93	7	4	91	5	88 NBR M00101	401582	○
90	98	7	4	96	5	88 NBR M00101	86197	●
100	108	10	5,5	106	5	88 NBR M00101	86198	●
110	122	10	5,5	119	7	88 NBR M00101	86199	●
115	127	10	5,5	124	7	88 NBR M00101	401585	○
125	137	10	5,5	134	7	88 NBR M00101	86200	●
140	152	10	5,5	149	7	88 NBR M00101	401586	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Wiper AUPS

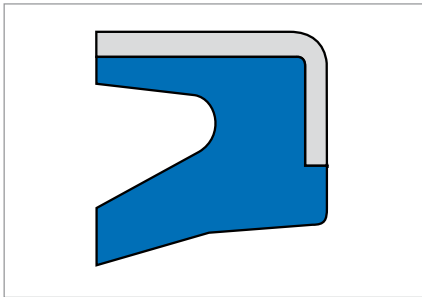


Fig. 1 Merkel Wiper AUPS

Product description

Dirt wiper with metal housing; wiper lip flush with housing.

Product advantages

Single-acting wiper for the protection of cylinders against ingress of dirt; especially also as protective component and sealing component for pivoting bearings, amongst others, in standardised housings according to ISO 6195 Type B

- Secure seating in the housing (press fitting), no rotation with the shaft on pivoting motion
- Re-greasing of pivoting bearings possible without problems; lip opens at low overpressure; old grease can escape
- Low axial housing height, wiper lip not protruding
- Axially open, easy to manufacture housing.

Application

Earth moving equipment, agricultural machinery, loading platforms, pivoting pin seal, industrial vehicle, cranes, support cylinders.

Material

Material	Code	Hardness	Metal housing
Polyurethane	94 AU 925	94 Shore A	unalloyed steel DIN 1624

Operating conditions

Material	94 AU 925
Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +40
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +40
Mineral greases	-30 ... +110
Running speed v in m/s	2 m/s

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm*	≤2,5 µm*
Groove base	≤1,6 µm	≤6,3 µm
Side of groove	≤3,0 µm	≤15,0 µm

percentage contact area Mr>50% up to max 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

* On usage as a wiper, surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	D
30 ... 100	H8

The tolerance for the Ø d is defined by the buffer seal.

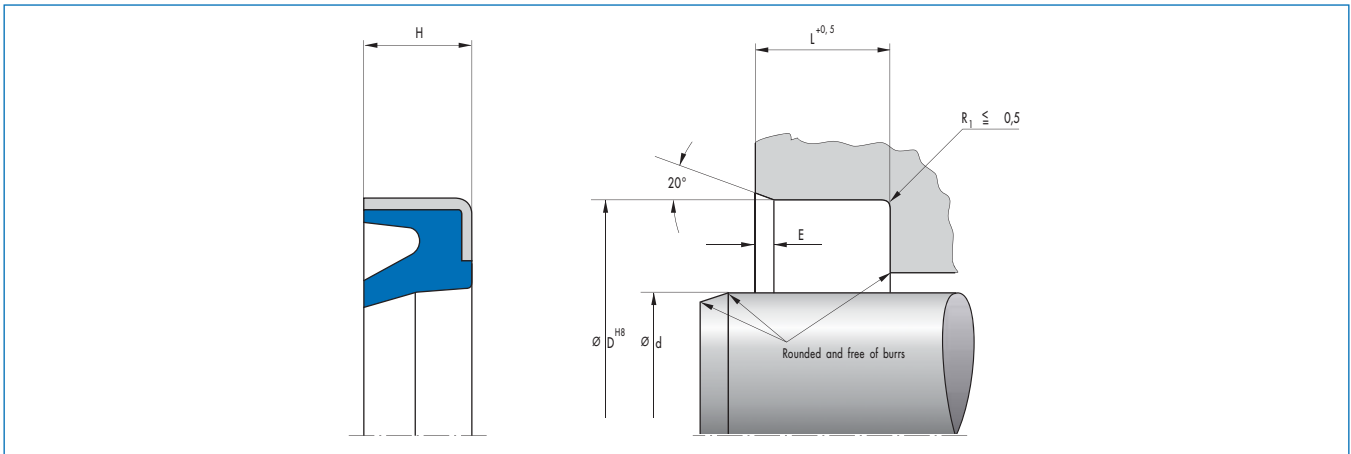
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

Merkel Wiper AUPS wipers are pressed into axially open housings. Careful fitting is a prerequisite for the correct function of the wiper. → Technical Manual.

Article list



d	D	H / L	C	Housing	Material	Article No.	
35	45	7	0,7		94 AU P00925	522243	●
40	50	7	1	ISO	94 AU P00925	522244	●
45	55	7	0,8	ISO	94 AU P00925	522248	●
50	60	7	0,7	ISO	94 AU P00925	522249	●
70	80	7	1	ISO	94 AU P00925	522250	●
80	90	7	0,7	ISO	94 AU P00925	522251	●
90	100	7	1		94 AU P00925	49003160	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Wiper AUAS

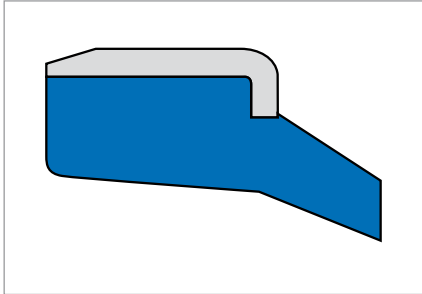


Fig. 1 Merkel Wiper AUAS

Product description

Dirt wiper with metal housing, wiper lip protruding with sharp, punched sealing edge.

Product advantages

Single-acting wiper for the protection of cylinders against ingress of dirt, use in standardised housings, amongst others, according to ISO 6195 Type B

- Secure seating in housing (press fitting)
- No open ring gap to the outside (dirt pocket) between rod and wiper housing
- No pressure build-up between wiper and seal
- Axially open, easy to manufacture housing

As a preference, we recommend the use of the more modern type AUAS R. The wiper lip with a radius reliably wipes away dirt and simultaneously leaves a residual film of oil on the retracting rod; friction behaviour, tightness and service life of the whole system are further improved.

Application

Earth moving equipment, agricultural machinery, loading platforms, support cylinders, industrial vehicles, cranes, presses.

Material

Material	Code	Hardness	Metal housing
Polyurethane	94 AU 925	94 Shore A	unalloyed steel DIN 1624

Operating conditions

Material	94 AU 925
Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +40
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +60
HEPG (glycol)	-30 ... +40
Mineral greases	-30 ... +110
Running speed v in m/s	2

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 µm	≤6,3 µm
Side of groove	≤3,0 µm	≤15,0 µm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	D
10 ... 260	H8

The tolerance for the Ø d is defined by the buffer seal.

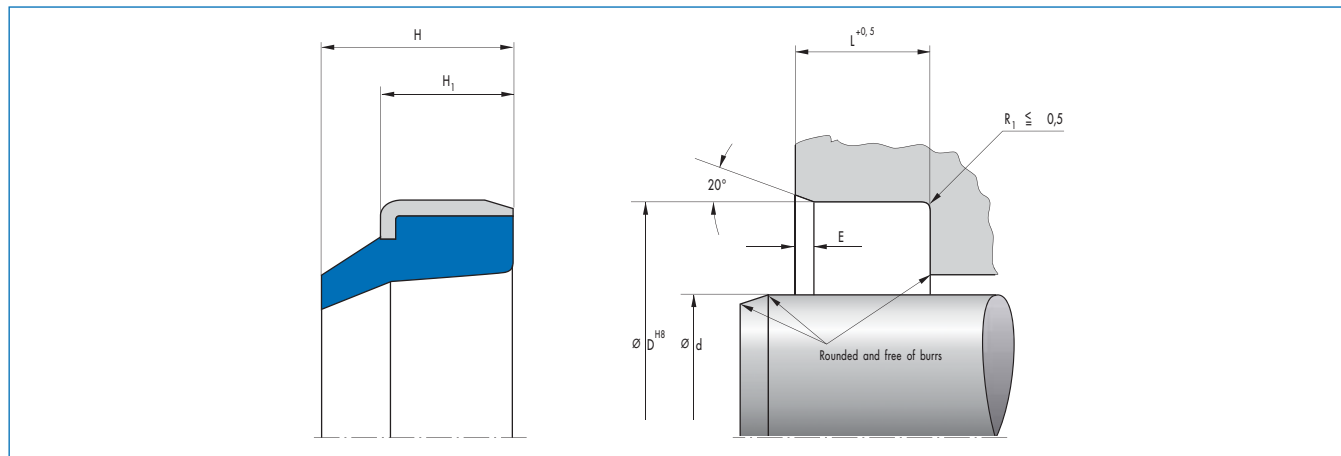
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

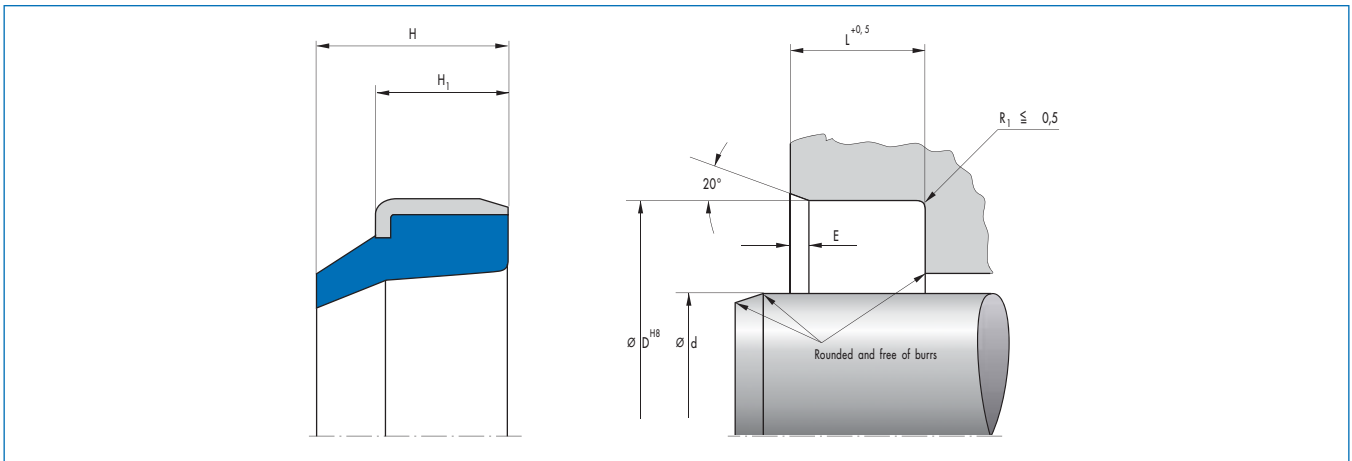
The Merkel Wiper AUAS is pressed into axially open housings. Careful fitting is a prerequisite for the correct function of the wiper. → Technical Manual.

Article list



d	D	H ₁ / L	H	C	Housing	Material	Article No.	
10	20	5	8	0,7		94 AU P00925	12659	●
12	20	4	6	0,4		94 AU P00925	24916	●
12	22	5	8	0,7		94 AU P00925	12660	●
14	25	5	8	0,7		94 AU P00925	35853	●
15	25	5	8	0,7		94 AU P00925	12662	●
16	22	3	4	0,3		94 AU P00925	24910	●
16	26	5	8	0,7		94 AU P00925	12664	●
18	28	7	10	1	ISO	94 AU P00925	12666	●
20	28	4	5	0,4		94 AU P00925	12668	●
20	30	4	6	0,4		94 AU P00925	32064	●
20	30	7	10	1	ISO	94 AU P00925	12670	●
22	32	7	10	1	ISO	94 AU P00925	12672	●
25	35	7	10	1	ISO	94 AU P00925	24905	●
28	40	7	10	1		94 AU P00925	12680	●
30	40	5	8	0,7		94 AU P00925	24925	●
30	40	7	10	1		94 AU P00925	32066	●
30	45	5	8	0,7		94 AU P00925	12683	●
32	45	4	8	0,4		94 AU P00925	24904	●
32	45	7	10	1		94 AU P00925	12685	●
35	45	7	10	1		94 AU P00925	24903	●
36	45	7	10	1		94 AU P00925	24935	●
38	48	7	10	1		94 AU P00925	24912	●
40	50	5	8	0,7		94 AU P00925	24908	●
40	50	7	10	1	ISO	94 AU P00925	12691	●
42	52	7	10	1		94 AU P00925	24922	●
45	55	7	10	1	ISO	94 AU P00925	4104	●
45	60	7	10	1		94 AU P00925	24888	●
48	60	7	10	1		94 AU P00925	12697	●
50	56	5	7	0,7		94 AU P00925	24889	●
50	60	7	10	1	ISO	94 AU P00925	24927	●
52	62	7	10	1		94 AU P00925	12699	●
55	63	7	10	1		94 AU P00925	24923	●
60	70	7	10	1		94 AU P00925	12708	●
60	74	5	8	0,7		94 AU P00925	24890	●
63	75	7	10	1		94 AU P00925	15939	●
65	75	7	10	1		94 AU P00925	24902	●

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H ₁ / L	H	C	Housing	Material	Article No.	
70	80	7	10	1	ISO	94 AU P00925	24901	●
75	83	7	10	1		94 AU P00925	33555	○
75	85	7	10	1		94 AU P00925	24909	●
80	90	7	10	1	ISO	94 AU P00925	24907	●
85	95	7	10	1		94 AU P00925	12718	●
90	100	7	10	1	ISO	94 AU P00925	24893	●
95	105	7	10	1		94 AU P00925	24894	●
100	110	7	10	1		94 AU P00925	24895	●
100	115	8	10	1		94 AU P00925	103750	●
105	115	7	10	1		94 AU P00925	12721	●
110	120	7	10	1		94 AU P00925	103752	●
115	125	7	10	1		94 AU P00925	103753	●
120	130	7	10	1		94 AU P00925	103754	●
125	140	9	12	1	ISO	94 AU P00925	103755	●
130	145	9	12	1		94 AU P00925	103756	●
135	150	9	12	1		94 AU P00925	103757	●
140	155	9	12	1	ISO	94 AU P00925	103758	●
150	165	9	12	1		94 AU P00925	103759	●
160	175	9	12	1	ISO	94 AU P00925	103760	●
180	195	10	14	1		94 AU P00925	103761	●
200	220	12	16	1		94 AU P00925	103763	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Wiper AUAS R

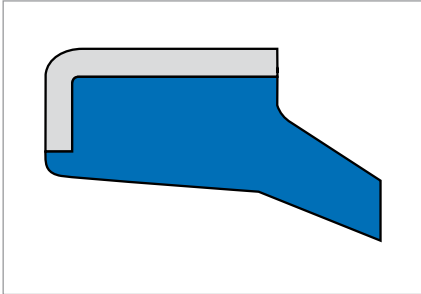


Fig. 1 Merkel Wiper AUAS R ("Radius")

Product description

Dirt wiper with metal housing, wiper lip protruding; AUAS with slightly rounded sealing edge.

Product advantages

Single-acting wiper for the protection of cylinders against ingress of dirt, use in standardised housings, amongst others, according to ISO 6195 Type B

- Secure seating in housing (press fitting)
- No open ring gap to the outside (dirt pocket) between rod and wiper housing
- No pressure build-up between wiper and seal
- Axially open, easy to manufacture housing

As a preference, we recommend the use of the modern type AUAS R. The wiper lip with a radius reliably wipes away dirt and simultaneously leaves a residual film of oil on the retracting rod; friction behaviour, tightness and service life of the whole system are further improved.

Application

Earth moving equipment, agricultural machinery, loading platforms, support cylinders, industrial vehicles, cranes, presses.

Material

Material	Code	Hardness	Metal housing
Polyurethane	94 AU 925	94 Shore A	unalloyed steel DIN 1624

Operating conditions

Material	94 AU 925
Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +40
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +60
HEPG (glycol)	-30 ... +40
Mineral greases	-30 ... +110
Running speed v in m/s	2

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 µm	≤6,3 µm
Side of groove	≤3,0 µm	≤15,0 µm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	D
10 ... 260	H8

The tolerance for the Ø d is defined by the buffer seal.

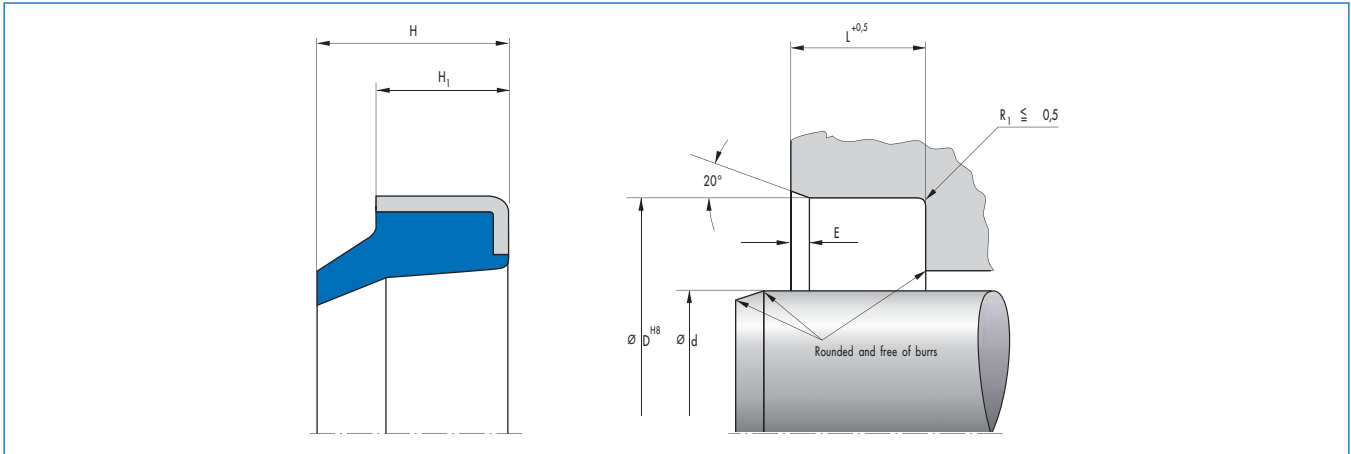
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

The Merkel Wiper AUAS R is pressed into axially open housings. Careful fitting is a prerequisite for the correct function of the wiper. → Technical Manual.

Article list



d	D	H ₁ / L	H	C	Housing	Material	Article No.	
25	35	7	10	1		94 AU 925	49044060	●
30	40	7	10	1		94 AU P00925	521387	●
35	45	7	10	1		94 AU P00925	521935	●
40	50	7	10	1	ISO	94 AU P00925	521393	●
45	55	7	10	1	ISO	94 AU P00925	521400	●
50	60	7	10	1	ISO	94 AU P00925	521404	●
55	65	7	10	1		94 AU P00925	530779	●
60	70	7	10	1		94 AU P00925	521431	●
65	75	7	10	1		94 AU P00925	530783	●
70	80	7	10	1	ISO	94 AU P00925	521502	●
80	90	7	10	1	ISO	94 AU P00925	521506	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Wiper AUASOB

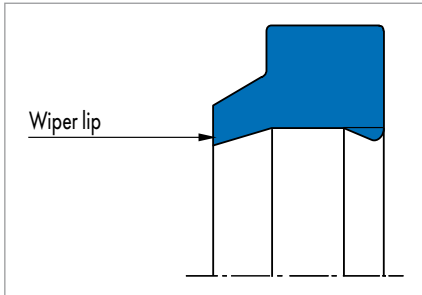


Fig. 1 Merkel Wiper AUASOB

Product description

Dirt wiper without metal reinforcement, protruding wiper lip and base face support.

Product advantages

Single-acting wiper for the protection of cylinders against ingress of dirt, use in standardised housings according to ISO 6195 Type A.

Application

Standard cylinders.

Material

Material	Code	Hardness
Polyurethane	94 AU 925	94 Shore A

Operating conditions

Material	94 AU 925
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +40
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Running speed v in m/s	2

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 μm	≤6,3 μm
Side of groove	≤3,0 μm	≤15,0 μm

* Surface roughness of the sliding surface to suit the sealing component used.

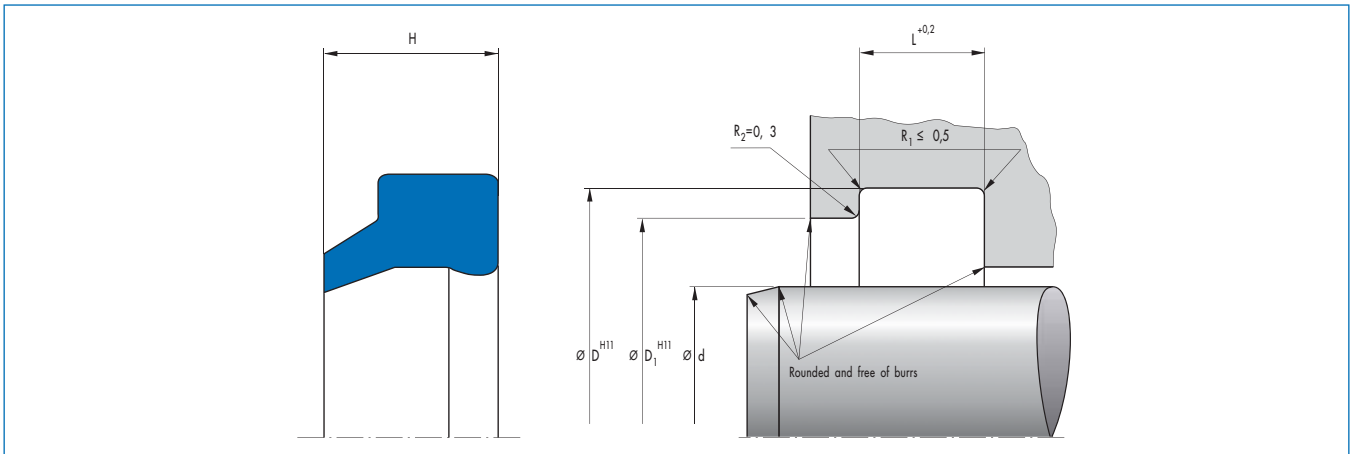
Design notes

Please observe our general design notes in → Technical Manual.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the wiper. Merkel Wiper AUASOB can be quickly and easily fitted by deforming into a kidney shape. → Technical Manual.

Article list



d	D	H	L	D ₁	Material	Article No.	
6	14	4,8	7	11,5	94 AU P00925	401478	○
8	16	4,8	7	13,5	94 AU P00925	401479	○
10	18	4,8	7	15,5	94 AU P00925	401486	●
12	20	4,8	7	17,5	94 AU P00925	351679	●
14	22	4,8	7	19,5	94 AU P00925	351680	●
16	24	4,8	7	21,5	94 AU P00925	336668	●
18	26	4,8	7	23,5	94 AU P00925	351681	●
20	28	4,8	7	25,5	94 AU P00925	336667	●
20	28	4,8	7	25,5	94 AU P00925	49039294	●
22	30	4,8	7	27,5	94 AU P00925	336666	●
25	33	4,8	7	30,5	94 AU P00925	336670	●
28	36	4,8	7	33,5	94 AU P00925	351683	●
32	40	4,8	7	37,5	94 AU P00925	336671	●
36	44	4,8	7	41,5	94 AU P00925	395708	●
40	48	4,8	7	45,5	94 AU P00925	336665	●
45	53	4,8	7	50,5	94 AU P00925	336663	●
50	58	4,8	7	55,5	94 AU P00925	336664	●
56	66	6,1	8,3	63	94 AU P00925	351685	○
63	73	6,1	8,3	70	94 AU P00925	336662	●
70	80	6,1	8,3	77	94 AU P00925	351686	●
80	90	6,1	8,3	87	94 AU P00925	336661	●
100	115	9,3	12,3	110	94 AU P00925	336660	●
110	125	9,3	12,3	120	94 AU P00925	351690	●
125	140	9,3	12,3	135	94 AU P00925	336659	●
140	155	9,3	12,3	150	94 AU P00925	351693	○
155	170	9,3	12,3	165	94 AU P00925	49013135	○
160	175	9,3	12,3	170	94 AU P00925	336658	○
180	195	9,3	12,3	190	94 AU P00925	336657	○
200	215	9,3	12,3	210	94 AU P00925	336672	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Wiper P 6

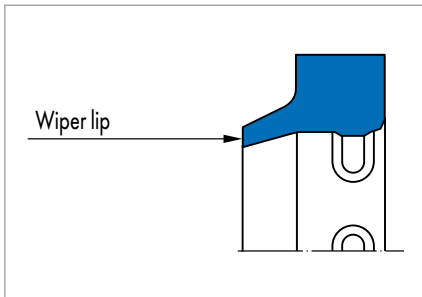


Fig. 1 Merkel Wiper P 6

Product description

Single-acting elastomeric dirt wiper with bearing segments.

Product advantages

NBR dirt wiper that is primarily used for large diameters

- Good seating at the outside diameter
- Very good wiping action
- Wiper can be used for a wide temperature range
- No twisting in the housing and no pressure build-up between seal and wiper.

Application

Steel hydraulics engineering, mills, presses.

Material

Material	Code	Hardness
Nitrile rubber NBR	85 NBR B247	85 Shore A
Fluoro rubber FKM	85 FKM K664	85 Shore A

Operating conditions

Material	85 NBR B247	85 FKM K664
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-10 ... +200
HFA fluids	+5 ... +60	+5 ... +60
HFB fluids	+5 ... +60	+5 ... +60
HFC fluids	-30 ... +60	-
HFD fluids	-	-10 ... +200
Water	+5 ... +100	+5 ... +80
HETG (rapeseed oil)	-30 ... +80	-10 ... +80
HEES (synthetic esters)	-30 ... +80	-10 ... +100
HEPG (glycol)	-30 ... +60	-10 ... +80
Mineral greases	-30 ... +100	-10 ... +200
Running speed v in m/s	2	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 μm	≤6,3 μm
Side of groove	≤3,0 μm	≤15,0 μm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	D	D ₁
20 ... 2900	H10	H11

The tolerance for the Ø d is defined by the buffer seal.

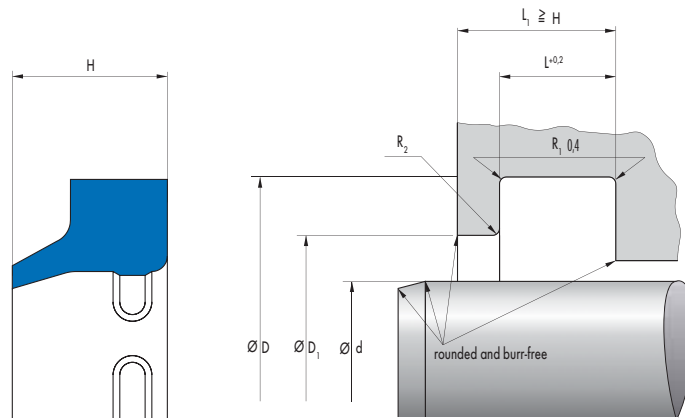
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the Merkel Wiper P 6. Generally, wipers can be quickly and easily fitted by deforming into a kidney shape.
→ Technical Manual.

Article list

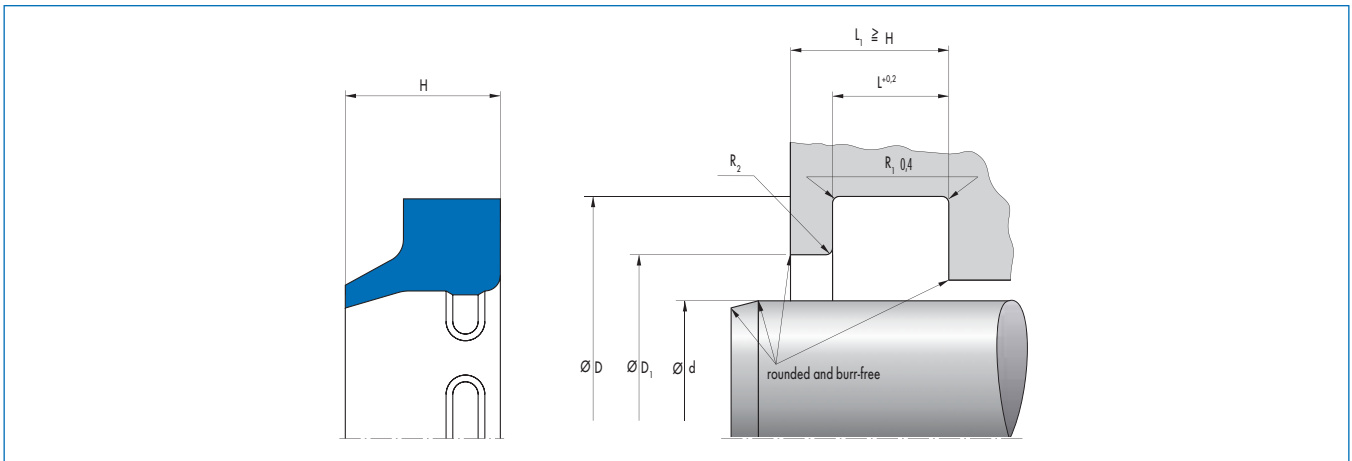


d	D	L	H	D ₁	Profile	R ₂	Material	Article No.	
16	24,6	5,3	7	19	4,3	1	85 FKM K664	24045457	○
20	28,6	5,3	7	23	4,3	1	85 FKM K664	24038859	●
24	32,6	5,3	7	27	4,3	1	85 FKM K664	24138825	○
25	33,6	5,3	7	28	4,3	1	85 FKM K664	24041104	●
28	36,6	5,3	7	31	4,3	1	85 FKM K664	24032459	●
30	38,6	5,3	7	33	4,3	1	85 FKM K664	24040159	●
32	40,6	5,3	7	35	4,3	1	85 FKM K664	24050857	●
35	43,6	5,3	7	38	4,3	1	85 FKM K664	24033859	●
42	50,6	5,3	7	45	4,3	1	85 FKM K664	24044057	○
45	53,6	5,3	7	48	4,3	1	85 FKM K664	24040959	○
45	55,6	5,3	7	48	5,3	1	85 FKM K664	24056947	●
50	58,6	5,3	7	53	4,3	1	85 FKM K664	24036259	●
55	65,6	5,3	7	58	5,3	1	85 FKM K664	24049905	●
56	66,6	5,3	7	59	5,3	1	85 FKM K664	24049005	●
60	70,6	5,3	7	63	5,3	1	85 FKM K664	24038207	●
60	75	8,2	13	67,6	7,5	1,5	85 NBR B247	24004856	○
63	73,6	5,3	7	66	5,3	1	85 FKM K664	24040605	●
65	75,6	5,3	7	70	5,3	1	85 FKM K664	24040105	●
70	78,6	5,3	7	73	4,3	1	85 FKM K664	24147620	○
70	80,6	5,3	7	73	5,3	1	85 FKM K664	24046105	●
75	87,2	7,2	12	81	6,1	1	85 FKM K664	24043206	●
80	88,6	5,3	7	83	4,3	1	85 FKM K664	24044959	○
80	92,2	7,2	12	86	6,1	1	85 FKM K664	24032405	●
85	97,2	7,2	12	91	6,1	1	85 FKM K664	24031805	●
90	102,2	7,2	12	96	6,1	1	85 FKM K664	24033905	●
100	108,6	5,3	7,1	103	4,3	1	85 FKM K664	24051358	○
100	112,2	7,2	12	106	6,1	1	85 FKM K664	24031905	●
105	117,2	7,2	12	111	6,1	1	85 FKM K664	24046106	○
110	122,2	7,2	12	116	6,1	1	85 FKM K664	24042306	●
115	127,2	7,2	12	121	6,1	1	85 FKM K664	24041405	●
120	130,6	5,3	7	123	5,3	1	85 FKM K664	24050006	○
120	132,2	7,2	12	126	6,1	1	85 FKM K664	24047507	○
140	155	10,2	16	147,6	7,5	1,5	85 FKM K664	24043305	●
150	165	10,2	16	157,6	7,5	1,5	85 FKM K664	24048705	●
160	175	10,2	16	167,6	7,5	1,5	85 FKM K664	24030705	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	H	D ₁	Profile	R ₂	Material	Article No.	
180	200	10,2	18	190	10	3	85 FKM K664	24072417	●
190	210	10,2	18	200	10	3	85 FKM K664	24059854	○
200	220	10,2	18	210	10	3	85 FKM K664	24031705	●
205	220	7,7	16	212,6	7,5	1,5	85 NBR B247	24231362	○
210	225	10,2	16	217,6	7,5	1,5	85 FKM K664	24293787	○
220	235	10,2	16	227,6	7,5	1,5	85 NBR B203	24005062	●
220	240	10,2	18	230	10	3	85 NBR B247	24005063	●
220	240	10,2	18	230	10	3	85 FKM K664	24066033	●
225	245	10,2	18	235	10	3	85 NBR B247	24005067	●
230	245	10,2	16	237,6	7,5	1,5	85 NBR B247	24005068	●
230	250	10,2	18	240	10	3	85 NBR B247	24005069	●
230	250	10,2	18	240	10	3	85 FKM K664	24089283	●
240	260	10,2	18	250	10	3	85 NBR B247	24005075	●
240	260	10,2	18	250	10	3	85 FKM K664	24143309	●
250	270	10,2	18	260	10	3	85 NBR B247	24005077	●
250	270	10,2	18	260	10	3	85 FKM K664	24064910	●
260	280	10,2	18	270	10	3	85 NBR B247	24005083	●
265	280	10,2	16	272,6	7,5	1,5	85 NBR B247	24005085	●
270	290	10,2	18	280	10	3	85 NBR B247	24005089	●
270	290	10,2	18	280	10	3	85 FKM K664	24339192	○
280	310	15,2	25	295	15	1,5	85 NBR B247	49014353	○
290	305	7,7	13,5	297,6	7,5	1,5	85 FKM K664	24145755	○
290	305	7,7	15	297,6	7,5	1,5	85 NBR B247	24005096	●
300	320	10,2	18	310	10	3	85 NBR B247	24005100	●
300	320	10,2	18	310	10	3	85 FKM K664	24170871	●
320	340	10,2	18	330	10	3	85 FKM K664	24123970	●
350	375	12,7	20	362,6	12,5	3	85 FKM K664	24068245	○
350	380	15,2	25	365	15	3	85 NBR B247	24108805	○
360	380	10,2	18	370	10	3	85 NBR B247	24375894	○
365	390	12,7	20	377,6	12,5	3	85 NBR B247	24374800	○
370	390	10,2	18	380	10	3	85 NBR B247	24327520	○
380	400	10,2	18	390	10	3	85 NBR B247	24114551	○
380	410	15,2	25	395	15	3	85 NBR B247	24005124	●
380	410	15,2	25	395	15	3	85 FKM K664	24067592	●
400	420	10,2	18	410	10	3	85 NBR B247	24005129	●
400	420	10,2	18	410	10	3	85 FKM K664	24149417	●
420	440	10,2	18	430	10	3	85 NBR B247	24090552	○
420	450	15,2	25	434,8	15	3	85 NBR B247	24005133	●
420	450	15,2	25	434,8	15	3	85 FKM K664	24222589	○
430	455	12,7	20	442,6	12,5	3	85 NBR B247	24073523	○
440	460	10,2	18	450	10	3	85 NBR B247	24197297	○
450	470	10,2	18	460	10	3	85 NBR B247	24005139	●
450	470	10,2	18	460	10	3	85 FKM K664	24216086	○
460	480	10,2	18	470	10	3	85 NBR B247	24095767	●
500	520	10,2	18	510	10	3	85 NBR B247	24005145	●
500	520	10,2	18	510	10	3	85 FKM K664	24239807	○
510	540	15,2	25	525	15	3	85 FKM K664	24350197	○
520	550	15,2	25	534,8	15	3	85 NBR B247	24193087	●
530	560	15,2	25	544,8	15	3	85 NBR B247	24005152	●
555	580	12,7	20	567,6	12,5	3	85 NBR B247	24092902	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	L	H	D ₁	Profile	R ₂	Material	Article No.	
560	585	12,7	20	572,6	12,5	3	85 NBR B247	24079694	○
575	600	12,7	20	587,6	12,5	3	85 NBR B247	24085742	○
600	625	12,7	20	612,6	12,5	3	85 NBR B247	24112281	○
610	635	12,7	20	622,6	12,5	3	85 NBR B247	24138641	○
630	655	12,7	20	642,6	12,5	3	85 NBR B247	24073341	○
640	665	12,7	20	652,6	12,5	3	85 NBR B247	24133481	○
670	695	12,7	20	682,6	12,5	3	85 NBR B247	24075321	○
680	705	12,7	20	692,6	12,5	3	85 NBR B247	24170551	○
700	725	12,7	20	712,6	12,5	3	85 NBR B247	24356247	○
710	735	12,7	20	722,6	12,5	3	85 NBR B247	24075142	○
720	745	12,7	20	732,6	12,5	3	85 NBR B247	24181926	○
750	775	12,7	20	762,6	12,5	3	85 NBR B247	24104001	○
770	795	12,7	20	782,6	12,5	3	85 NBR B247	24343859	○
780	805	12,7	20	792,6	12,5	3	85 NBR B247	24100033	○
800	825	12,7	20	812,6	12,5	3	85 NBR B247	24069967	○
800	830	15,2	25	815	15	3	85 FKM K664	24362636	○
850	875	12,7	20	862,6	12,5	3	85 NBR B247	24082304	○
880	905	12,7	20	892,6	12,5	3	85 NBR B247	24182227	○
900	925	12,7	20	912,6	12,5	3	85 NBR B247	24005167	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Wiper PU 5

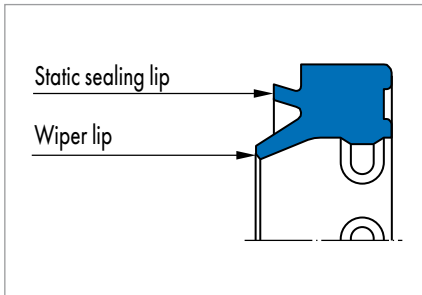


Fig. 1 Merkel Wiper PU 5

Product description

Dirt wiper with additional static sealing lip and bearing segments; sealing edge of wiper lip slightly rounded.

Product advantages

Single-acting wiper, use also in standardised housings according to ISO 6195 Type A

- Additional static sealing lip prevents ingress of dirt and water spray
- Wiper lip with slightly rounded sealing edge reliably wipes dirt away and leaves a residual oil film on the retracting rod; friction behaviour and service life are improved
- The support on the wiper heel prevents twisting in the groove as well as pressure build-up between wiper and seal.

Application

Earth moving equipment, agricultural machinery, injection moulding machines, telescopic cylinders, presses, industrial vehicles, cranes, mining, loading platforms, support cylinders.

Material

Material	Code	Hardness
Polyurethane	95 AU V149	95 Shore A

Operating conditions

Material	95 AU V149
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Running speed v in m/s	2

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 µm	≤6,3 µm
Side of groove	≤3,0 µm	≤15,0 µm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	D	D ₁
16 ... 200	H11	H11

The tolerance for the Ø d is defined by the buffer seal.

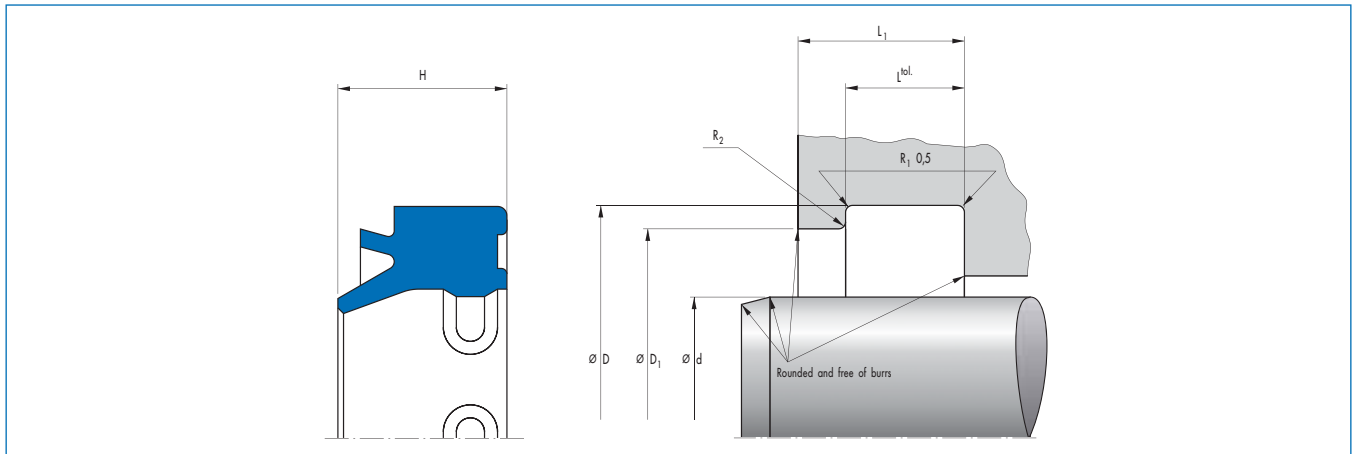
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the Merkel Wiper PU 5. Generally, wipers can be quickly and easily fitted by deforming into a kidney shape. → Technical Manual.

Article list



d	D	D ₁	L	Tolerance for L	L ₁	R ₁ max.	H	Profile	Housing	Material	Article No.	
16	24	21,5	5	0,2	7	0,3	7,8	4	ISO	95 AU V149	24314500	●
16	24	22	4	0,2	5	0,3	7	4		95 AU V149	24314499	●
18	26	23,5	5	0,2	7	0,3	7,8	4	ISO	95 AU V149	24314502	○
18	26	24	4	0,2	5	0,3	7	4		95 AU V149	24314501	●
20	28	25,5	5	0,2	7	0,3	7,8	4	ISO	95 AU V149	24312946	●
20	28	26	4	0,2	5	0,3	7	4		95 AU V149	24314503	●
22	30	27,5	5	0,2	7	0,3	7,8	4	ISO	95 AU V149	24314506	○
22	30	28	4	0,2	5	0,3	7	4		95 AU V149	24314505	●
25	33	30,5	5	0,2	7	0,3	7,8	4	ISO	95 AU V149	24297872	●
25	33	31	4	0,2	5	0,3	7	4		95 AU V149	24314507	●
28	36	33,5	5	0,2	7	0,3	7,8	4	ISO	95 AU V149	24294374	○
28	36	34	4	0,2	5	0,3	7	4		95 AU V149	24314509	●
30	38	36	4	0,2	5	0,3	7	4		95 AU V149	24314511	●
32	40	37,5	5	0,2	7	0,3	7,8	4	ISO	95 AU V149	24288780	●
32	40	38	4	0,2	5	0,3	7	4		95 AU V149	24314512	●
35	43	41	4	0,2	5	0,3	7	4		95 AU V149	24314513	●
36	44	41,5	5	0,2	7	0,3	7,8	4	ISO	95 AU V149	24294375	●
36	44	42	4	0,2	5	0,3	7	4		95 AU V149	24314514	●
40	48	45,5	5	0,2	7	0,3	7,8	4	ISO	95 AU V149	24291068	●
40	48	46	4	0,2	5	0,3	7	4		95 AU V149	24311206	●
45	53	50,5	5	0,2	7	0,3	7,8	4	ISO	95 AU V149	24288781	●
45	53	51	4	0,2	5	0,3	7	4		95 AU V149	24310500	●
50	58	55,5	5	0,2	7	0,3	7,8	4	ISO	95 AU V149	24275192	●
50	58	55,5	5	0,2	7	0,3	7,8	4	ISO	92 AU 21100	49045956	●
50	58	56	4	0,2	5	0,3	7	4		95 AU V149	24311362	●
55	63	61	4	0,2	5	0,3	7	4		95 AU V149	24311363	●
56	64	62	4	0,2	5	0,3	7	4		95 AU V149	24314518	●
56	66	63	6,3	0,2	8,3	0,4	9	5	ISO	95 AU V149	24289916	●
60	68	66	4	0,2	5	0,3	7	4		95 AU V149	24311364	●
60	70	67	6,3	0,2	8,3	0,4	6,3	5		95 AU V149	24275194	○
60	72	69	5,5	0,2	7	0,3	10	6		95 AU V149	24368032	○
63	71	69	4	0,2	5	0,3	7	4		95 AU V149	24311365	●
63	73	70	6,3	0,2	8,3	0,4	9	5	ISO	95 AU V149	24275195	●
65	73	71	4	0,2	5	0,3	7	4		95 AU V149	24314521	●
70	78	76	4	0,2	5	0,3	7	4		95 AU V149	24314522	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	D ₁	L	Tolerance for L	L ₁	R _{1 max.}	H	Profile	Housing	Material	Article No.	
70	80	77	6,3	0,2	8,3	0,4	9	5	ISO	95 AU V149	24288253	●
70	82	79	5,5	0,2	7	0,3	10	6		95 AU V149	24368033	○
75	83	81	4	0,2	5	0,3	7	4		95 AU V149	24314523	●
80	88	86	4	0,2	5	0,3	7	4		95 AU V149	24314524	●
80	90	87	6,3	0,2	8,3	0,4	9	5	ISO	95 AU V149	24288782	●
80	92	89	5,5	0,2	7	0,3	10	6		95 AU V149	24368034	○
85	93	91	4	0,2	5	0,3	7	4		95 AU V149	24314525	●
85	95	92	6,3	0,2	8,3	0,4	9	5		95 AU V149	49005211	●
90	98	96	4	0,2	5	0,3	7	4		95 AU V149	24314526	●
90	100	97	6,3	0,2	8,3	0,4	9	5	ISO	95 AU V149	24275179	●
90	102	99	5,5	0,2	7	0,3	10	6		95 AU V149	24368035	○
100	108	106	4	0,2	5	0,3	7	4		95 AU V149	24314527	●
100	115	110	9,5	0,3	12	0,6	13	7,5	ISO	95 AU V149	24275180	●
110	122	119	5,5	0,2	7	0,3	10	6		95 AU V149	24314528	●
110	125	120	9,5	0,3	12	0,6	13	7,5	ISO	95 AU V149	24265869	●
115	127	124	5,5	0,2	7	0,3	10	6		95 AU V149	24314529	○
120	132	129	5,5	0,2	7	0,3	10	6		95 AU V149	24314530	●
125	137	134	5,5	0,2	7	0,3	10	6		95 AU V149	24314531	●
125	140	135	9,5	0,3	12	0,6	13	7,5	ISO	95 AU V149	24289918	●
130	142	139	5,5	0,2	7	0,3	10	6		95 AU V149	24314532	○
140	152	149	5,5	0,2	7	0,3	10	6		95 AU V149	24314534	●
140	155	150	9,5	0,3	12	0,6	13	7,5	ISO	95 AU V149	24289919	●
150	162	159	5,5	0,2	7	0,3	10	6		95 AU V149	24314535	●
160	172	169	5,5	0,2	7	0,3	10	6		95 AU V149	24314536	●
160	175	170	9,5	0,3	12	0,6	13	7,5	ISO	95 AU V149	24289920	●
170	182	179	5,5	0,2	7	0,3	10	6		95 AU V149	24314538	○
180	192	189	5,5	0,2	7	0,3	10	6		95 AU V149	24314539	●
180	195	190	9,5	0,3	12	0,6	13	7,5	ISO	95 AU V149	24294376	○
200	212	209	5,5	0,2	7	0,3	10	6		95 AU V149	24314541	●
200	215	210	9,5	0,3	12	0,6	13	7,5	ISO	95 AU V149	24294377	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Wiper PU 6

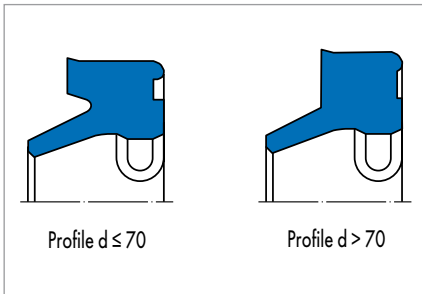


Fig. 1 Merkel Wiper PU 6

Product description

Single-acting PUR wiper with static sealing edge on the outside diameter.

Product advantages

Dirt wiper with bearing segments on the heel of the wiper and lightly rounded wiper lip

- No ingress of dirt and water spray via outside diameter
- Reliably wipes away dirt
- Leaves a residual film of oil on retracting rod
- No twisting and pressure build-up between seal and wiper
- Highly wear-resistant.

Application

Earth moving equipment, presses, mining, injection moulding machines, support cylinders.

Material

Material	Code	Hardness
Polyurethane	95 AU V149	95 Shore A

Operating conditions

Material	95 AU V149
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Running speed v in m/s	2

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 µm	≤6,3 µm
Side of groove	≤3,0 µm	≤15,0 µm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	D	D ₁
12 ... 200	H10	H11

The tolerance for the Ø d is defined by the buffer seal.

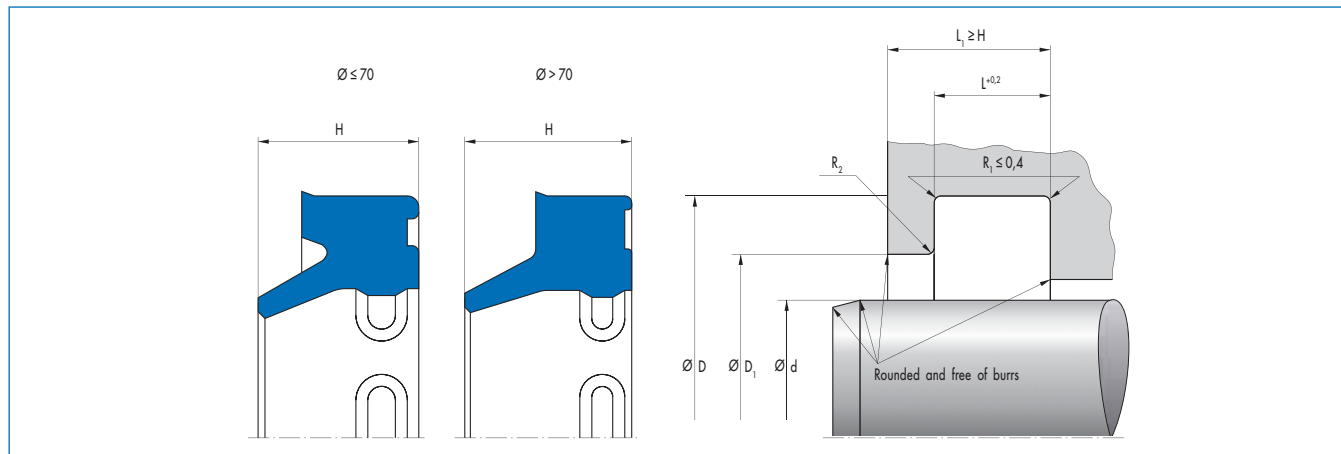
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

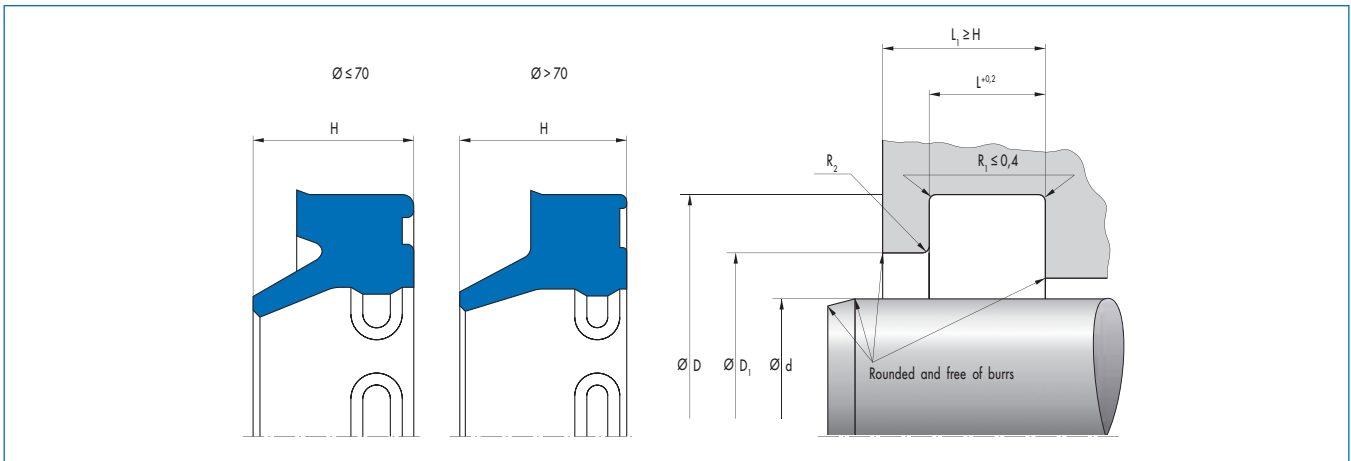
Careful fitting is a prerequisite for the correct function of the Merkel Wiper PU 6. Generally, wipers can be quickly and easily fitted by deforming into a kidney shape. → Technical Manual.

Article list



d	D	L	H	D ₁	Profile	R ₂	Material	Article No.	
12	18,6	3,8	5,3	15	3,3	1	95 AU V149	24375925	○
14	20,6	3,8	5,3	17	3,3	1	95 AU V149	24375926	○
16	22,6	3,8	5,3	19	3,3	1	95 AU V149	24375927	○
18	24,6	3,8	5,3	21	3,3	1	95 AU V149	24375928	○
20	28,6	5,3	6,5	23	4,3	1	95 AU V149	24004784	●
22	30,6	5,3	6,5	25	4,3	1	95 AU V149	24004788	●
25	33,6	5,3	6,5	28	4,3	1	95 AU V149	24004792	●
28	36,6	5,3	6,5	31	4,3	1	95 AU V149	24004798	●
30	38,6	5,3	6,5	33	4,3	1	95 AU V149	24004799	●
32	40,6	5,3	6,5	35	4,3	1	95 AU V149	24004805	●
35	43,6	5,3	6,5	38	4,3	1	95 AU V149	24004808	●
36	44,6	5,3	6,5	39	4,3	1	95 AU V149	24004811	●
40	48,6	5,3	6,5	43	4,3	1	95 AU V149	24004816	●
42	50,6	5,3	6,5	45	4,3	1	95 AU V149	24004820	●
45	53,6	5,3	6,5	48	4,3	1	95 AU V149	24375906	●
45	55,6	5,3	6,5	48	5,3	1	95 AU V149	24004827	●
50	58,6	5,3	6,5	53	4,3	1	95 AU V149	24375907	●
50	60,6	5,3	6,5	53	5,3	1	95 AU V149	24004835	●
55	65,6	5,3	7	58	5,3	1	95 AU V149	24004846	●
56	64,6	5,3	6,5	59	4,3	1	95 AU V149	24375908	○
56	66,6	5,3	7	59	5,3	1	95 AU V149	24004849	●
60	68,6	5,3	6,5	63	4,3	1	95 AU V149	24375909	○
60	70,6	5,3	7	63	5,3	1	95 AU V149	24004853	●
63	73,6	5,3	7	66	5,3	1	95 AU V149	24004859	●
65	75,6	5,3	7	68	5,3	1	95 AU V149	24004869	●
70	78,6	5,3	6,5	73	4,3	1	95 AU V149	24375910	○
70	80,6	5,3	7	73	5,3	1	95 AU V149	24004881	●
75	87,2	7,2	12	81	6,1	1	95 AU V149	24004892	●
80	92,2	7,2	12	86	6,1	1	95 AU V149	24004909	●
85	97,2	7,2	12	91	6,1	1	95 AU V149	24004917	●
90	102,2	7,2	12	96	6,1	1	95 AU V149	24004928	●
100	112,2	7,2	12	106	6,1	1	95 AU V149	24004944	●
105	117,2	7,2	12	111	6,1	1	95 AU V142	24004956	○
110	122,2	7,2	12	116	6,1	1	95 AU V149	24004961	●
115	127,2	7,2	12	121	6,1	1	95 AU V149	24004968	●

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	L	H	D ₁	Profile	R ₂	Material	Article No.	
120	132,2	7,2	12	126	6,1	1	95 AU V149	24004975	●
125	140	10,2	16	132,6	7,5	1,5	95 AU V149	24004981	●
140	155	10,2	16	147,6	7,5	1,5	95 AU V149	24005002	●
150	162,2	7,2	12	156	6,1	1	95 AU V142	24368329	○
150	165	10,2	16	157,6	7,5	1,5	95 AU V149	24005013	●
160	175	10,2	16	167,6	7,5	1,5	95 AU V149	24005025	●
180	200	10,2	18	190	10	3	95 AU V149	24005039	●
190	210	10,2	18	200	10	3	95 AU V149	24005044	●
200	220	10,2	18	210	10	3	95 AU V149	24005050	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Wiper PU 7

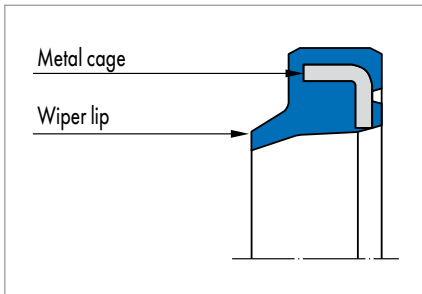


Fig. 1 Merkel Wiper PU 7

Product description

Single-acting dirt wiper made of polyurethane with integrated metal cage.

Product advantages

PUR wiper for axially accessible housings, amongst others, for standardised housings according to ISO 6195 Type B.

- Secure seating in housing (press fitting)
- Made of highly wear-resistant polyurethane
- No open ring gap to the outside (dirt pocket) between rod and housing
- Easy to manufacture housing
- No corrosion between housing and wiper cage.

Application

Earth moving equipment, industrial vehicles, presses, mining, injection moulding machines, support cylinders, agricultural machinery, cranes, loading platforms, telescopic cylinders.

Material

Material	Code	Hardness
Polyurethane	95 AU V149	95 Shore A

Operating conditions

Material	95 AU V149
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Running speed v in m/s	2

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 µm	≤6,3 µm
Side of groove	≤3,0 µm	≤15,0 µm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	D
10 ... 150	H8

The tolerance for the Ø d is defined by the buffer seal.

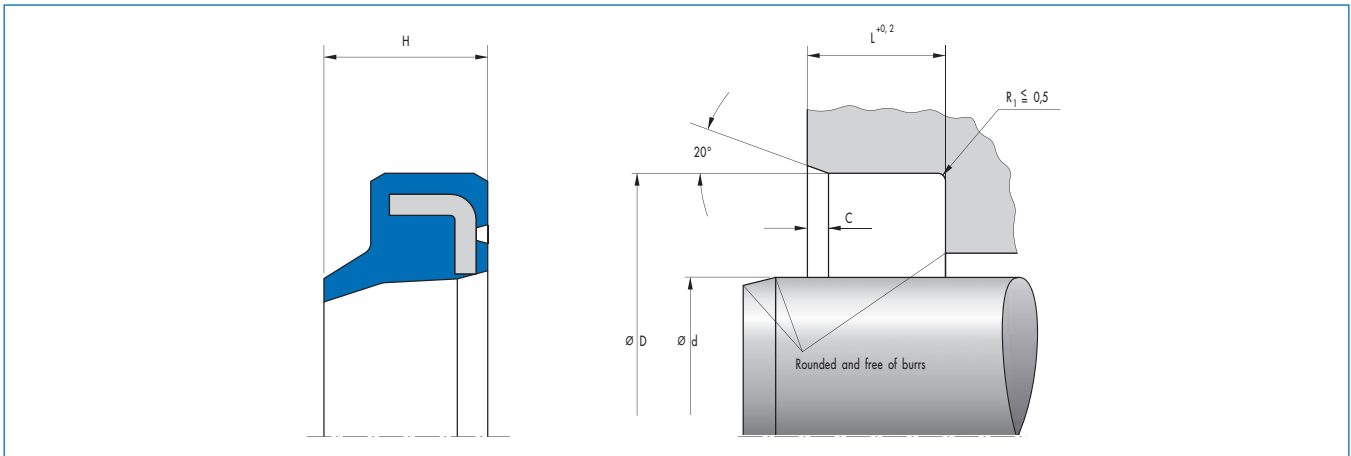
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the Merkel Wiper PU 7. Generally, wipers can be quickly and easily fitted by deforming into a kidney shape. → Technical Manual.

Article list



d	D	L	H	Profile	C	Material	Article No.	
10	20	5	8	5	1	95 AU V149	24245001	○
12	20	4	6	4	0,8	95 AU V149	24234908	●
12	22	5	8	5	1	95 AU V149	24245152	○
14	20	4	5	3	0,8	95 AU V149	24245101	●
14	24	7	10	5	1,2	95 AU V149	24245151	○
15	25	5	8	5	1	95 AU V149	24245103	○
16	22	3,5	5	3	0,8	95 AU V149	24245003	●
18	28	7	10	5	1,2	95 AU V149	24245150	●
20	28	3,5	5	4	0,8	95 AU V149	24245102	●
20	30	7	10	5	1,2	95 AU V149	24245002	●
22	32	5,5	7	5	1	95 AU V149	24244936	●
22	32	7	10	5	1,2	95 AU V149	24244937	○
25	32	5	7	3,5	1	95 AU V149	24237353	●
25	35	7	10	5	1,2	95 AU V149	24182670	●
28	38	7	10	5	1,2	95 AU V149	24182671	●
28	40	7	10	6	1,2	95 AU V149	24187185	●
30	40	5	8	5	1	95 AU V149	24244938	●
30	40	7	10	5	1,2	95 AU V149	24182672	●
32	42	7	10	5	1,2	95 AU V149	24244939	●
35	45	7	10	5	1,2	95 AU V149	24182674	●
36	46	7	10	5	1,2	95 AU V149	24182675	●
40	50	7	10	5	1,2	95 AU V149	24182676	●
42	52	7	10	5	1,2	95 AU V149	24182677	○
45	55	7	10	5	1,2	95 AU V149	24182678	●
50	60	7	10	5	1,2	95 AU V149	24182679	●
55	65	7	10	5	1,2	95 AU V149	24182680	●
56	66	7	10	5	1,2	95 AU V149	24182681	●
60	70	7	10	5	1,2	95 AU V149	24182682	●
63	75	7	10	6	1,2	95 AU V149	24182683	●
65	75	7	10	5	1,2	95 AU V149	24182684	●
70	80	7	10	5	1,2	95 AU V149	24182685	●
75	85	7	10	5	1,2	95 AU V149	24182686	●
80	90	7	10	5	1,2	95 AU V149	24182687	●
85	95	7	10	5	1,2	95 AU V149	24182688	●
90	100	7	10	5	1,2	95 AU V149	24182689	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	L	H	Profile	C	Material	Article No.	
95	105	7	10	5	1,2	95 AU V149	24182690	●
100	110	7	10	5	1,2	95 AU V149	24182691	●
105	115	7	10	5	1,2	95 AU V149	24182692	●
110	120	7	10	5	1,2	95 AU V149	24182693	●
115	125	7	10	5	1,2	95 AU V149	24182694	●
120	130	7	10	5	1,2	95 AU V149	24182695	●
125	140	9	12	7,5	1,5	95 AU V149	24182696	●
140	155	9	12	7,5	1,5	95 AU V149	24182697	●
145	160	9	12	7,5	1,5	95 AU V149	24182698	○
150	165	9	12	7,5	1,5	95 AU V149	24182699	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Double Wiper P 8

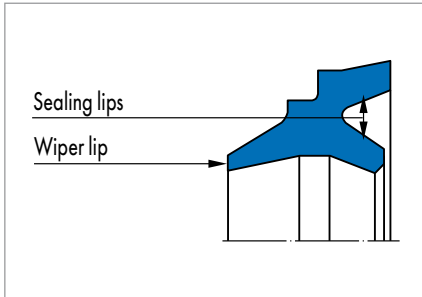


Fig. 1 Merkel Double Wiper PT 8

Product description

Elastomer double wiper.

Product advantages

The Merkel Double Wiper P 8 exerts inwards the wiping function of a U-ring, and a wiping action outwards against soiling

- Strong wiping action against dirt
- Very good sealing effect against residual film of oil on the extending rod
- Wear-resistant.

Application

Industrial vehicles, injection moulding machines, presses.

Merkel Double Wipers P 8 are preferably fitted in combination with our rod sealing systems Merkel Omegat OMS-MR and Merkel Omegat OMS-S. We recommend in any case the provision of a pressure relieving bore in front of the double wiper in order to avoid a pressure build-up between seal and wiper.

Material

D <200 mm

Material	Code	Hardness
Nitrile rubber NBR	90 NBR 109	90 Shore A

D >200 mm

Material	Code	Hardness
Fluoro rubber FKM	85 NBR B247	85 Shore A

Operating conditions

Material	90 NBR B283/85 NBR B247/90 NBR 109
Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +100
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Running speed v in m/s	1

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 µm	≤6,3 µm
Side of groove	≤3,0 µm	≤15,0 µm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal \varnothing d	D	D ₁	D ₂
16 ... 1000	H10	JS11	H10

The tolerance for the \varnothing d is defined by the buffer seal.

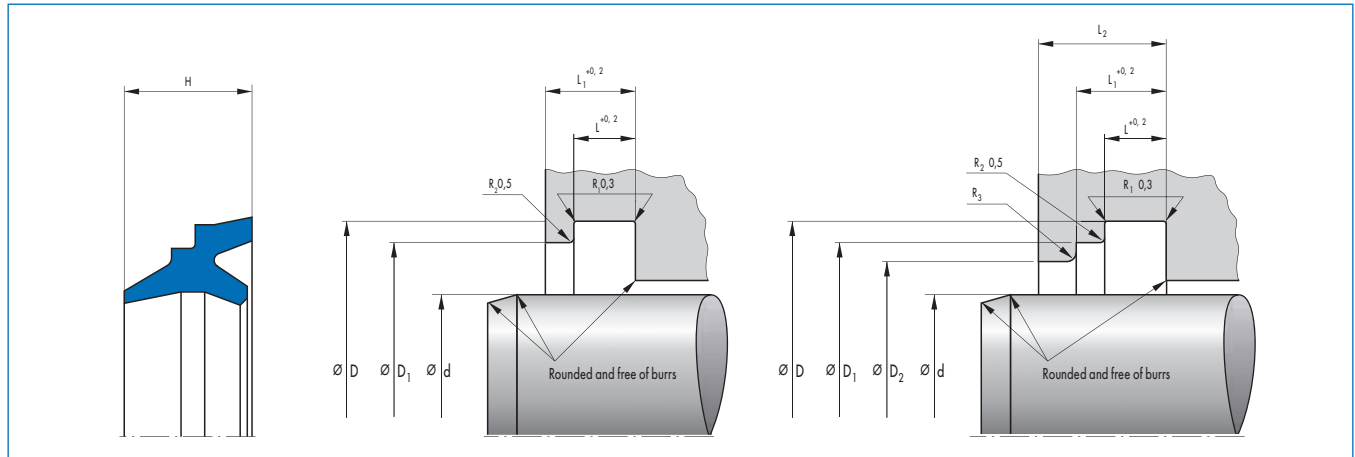
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the Merkel Double Wiper P 8. Generally, wipers can be quickly and easily fitted by deforming into a kidney shape.
→ Technical Manual.

Article list

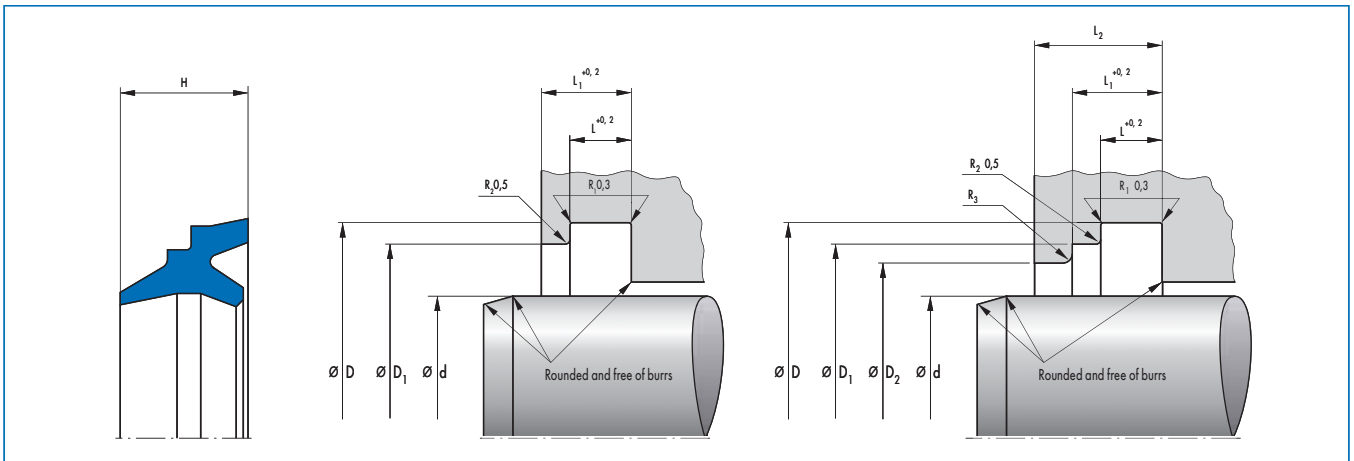


d	D	H	D ₁	D ₂	L	L ₁	L ₂	Profile	R ₃	Material	Article No.	
10	18	8	16	13,5	4	6	8	4	0,5	90 NBR 109	24224393	○
12	20	8	18	15,5	4	6	8	4	0,5	90 NBR 109	24224434	○
14	22	8	20	17,5	4	6	8	4	0,5	90 NBR 109	24224394	○
15	23	8	21	18,5	4	6	8	4	0,5	90 NBR 109	24224433	○
16	24	8	22	19,5	4	6	8	4	0,5	90 NBR 109	24224395	●
18	26	8	24	21,5	4	6	8	4	0,5	90 NBR 109	24224432	●
20	28	8	26	23,5	4	6	8	4	0,5	90 NBR 109	24224396	●
22	30	8	28	25,5	4	6	8	4	0,5	90 NBR 109	24224431	●
25	33	8	31	28,5	4	6	8	4	0,5	90 NBR 109	24224397	●
28	36	8	34	31,5	4	6	8	4	0,5	90 NBR 109	24224430	●
30	38	8	36	33,5	4	6	8	4	0,5	90 NBR 109	24224398	●
32	40	8	38	35,5	4	6	8	4	0,5	90 NBR 109	24224429	●
35	43	8	41	38,5	4	6	8	4	0,5	90 NBR 109	24224399	●
36	44	8	42	39,5	4	6	8	4	0,5	90 NBR 109	24224428	●
40	48	8	46	43,5	4	6	8	4	0,5	90 NBR 109	24224400	●
42	50	8	48	45,5	4	6	8	4	0,5	90 NBR 109	24224427	●
45	53	8	51	48,5	4	6	8	4	0,5	90 NBR 109	24217239	●
50	58	8	56	53,5	4	6	8	4	0,5	90 NBR 109	24197635	●
55	63	8	61	58,5	4	6	8	4	0,5	90 NBR 109	24224402	●
56	64	8	62	59,5	4	6	8	4	0,5	90 NBR 109	24224425	●
60	68	8	66	63,5	4	6	8	4	0,5	90 NBR 109	24224403	●
63	71	8	69	66,5	4	6	8	4	0,5	90 NBR 109	24224424	●
65	73	8	71	68,5	4	6	8	4	0,5	90 NBR 109	24224404	●
70	78	8	76	73,5	4	6	8	4	0,5	90 NBR 109	24224423	●
75	83	8	81	78,5	4	6	8	4	0,5	90 NBR 109	24224405	●
80	88	8	86	83,5	4	6	8	4	0,5	90 NBR 109	24224422	●
85	93	8	91	88,5	4	6	8	4	0,5	90 NBR 109	24224406	●
90	98	8	96	93,5	4	6	8	4	0,5	90 NBR 109	24224032	●
100	108	8	106	103,5	4	6	8	4	0,5	90 NBR 109	24224407	●
105	117	11	114	110	5,5	8,2	11,2	6	1	90 NBR 109	24224420	●
110	122	11	119	115	5,5	8,2	11,2	6	1	90 NBR B283	24224408	●
115	127	11	124	120	5,5	8,2	11,2	6	1	90 NBR B283	24224419	●
120	132	11	129	125	5,5	8,2	11,2	6	1	90 NBR 109	24224409	●
125	137	11	134	130	5,5	8,2	11,2	6	1	90 NBR B283	24224031	●
130	142	11	139	135	5,5	8,2	11,2	6	1	90 NBR 109	24224410	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	D ₁	D ₂	L	L ₁	L ₂	Profile	R ₃	Material	Article No.	
135	147	11	144	140	5,5	8,2	11,2	6	1	90 NBR 109	24224417	○
140	152	11	149	145	5,5	8,2	11,2	6	1	90 NBR 109	24224411	●
150	162	11	159	155	5,5	8,2	11,2	6	1	90 NBR 109	24224416	●
160	172	11	169	165	5,5	8,2	11,2	6	1	90 NBR 109	24224412	●
170	182	11	179	175	5,5	8,2	11,2	6	1	90 NBR 109	24224415	●
180	192	11	189	185	5,5	8,2	11,2	6	1	90 NBR B283	24224413	●
200	212	11	209	205	5,5	8,2	11,2	6	1	90 NBR 109	24224414	●
210	225	13	222	217	6,5	9,5	12,5	7,5	1,5	85 NBR B247	49017591	○
220	235	13	232	227	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354797	●
235	250	13	247	243	6,5	9,5	12,5	7,5	1,5	85 NBR B247	49017612	○
240	255	13	252	247	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354798	●
260	275	13	272	267	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354799	○
260	275	13	272	268	6,5	9,5	12,5	7,5	1,5	90 NBR 109	49036054	○
280	295	13	292	287	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354800	●
295	310	13	307	303	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355389	○
300	315	13	312	307	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354801	○
310	325	13	322	317	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24357280	○
315	330	13	327	323	6,5	9,5	12,5	7,5	1,5	85 NBR B247	527673	○
320	335	13	332	327	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355390	○
335	350	13	347	343	6,5	9,5	12,5	7,5	1,5	85 NBR B247	49017614	○
340	355	13	352	347	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354802	○
350	365	13	362	357	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24367045	○
355	370	13	367	363	6,5	9,5	12,5	7,5	1,5	85 NBR B247	49017597	○
360	375	13	372	367	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354803	●
380	395	13	392	387	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354804	○
390	405	13	402	398	6,5	9,5	12,5	7,5	1,5	85 NBR B247	49035280	○
400	415	13	412	407	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354805	○
420	435	13	432	427	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354806	○
425	440	13	437	433	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355391	○
440	455	13	452	447	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355392	○
445	460	13	457	453	6,5	9,5	12,5	7,5	1,5	85 NBR B247	49017720	○
450	465	13	462	457	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355393	○
460	475	13	472	467	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354807	●
470	485	13	482	477	6,5	9,5	12,5	7,5	1,5	85 NBR B247	49017615	○
480	495	13	492	487	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355394	○
485	500	13	497	493	9,5	9,5	12,5	7,5	1,5	85 NBR B247	530782	○
490	505	13	502	497	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24379846	○
500	515	13	512	507	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354808	○
540	555	13	552	547	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355395	○
550	565	13	562	557	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355396	○
560	575	13	572	567	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354809	○
570	585	13	582	478	6,5	9,5	12,5	7,5	1,5	85 NBR B247	49023111	○
580	595	13	592	587	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24357108	○
590	605	13	602	597	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355397	○
600	615	13	612	607	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354810	○
630	645	13	642	637	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354811	○
650	665	13	662	657	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355398	○
670	685	13	682	677	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24359048	○
680	695	13	692	687	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24354812	○
710	725	13	722	717	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355399	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	D ₁	D ₂	L	L ₁	L ₂	Profile	R ₃	Material	Article No.	
750	765	13	762	757	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355400	○
800	815	13	812	807	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355401	○
824	839	13	836	832	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24373706	○
840	855	13	852	847	6,5	9,5	12,5	7,5	1,5	85 NBR B247	527160	○
900	915	13	912	907	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24355402	○
905	920	13	917	913	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24368328	○
950	965	13	962	957	6,5	9,5	12,5	7,5	1,5	85 NBR B247	527757	○
1000	1015	13	1012	1007	6,5	9,5	12,5	7,5	1,5	85 NBR B247	24357109	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Double Wiper P 9

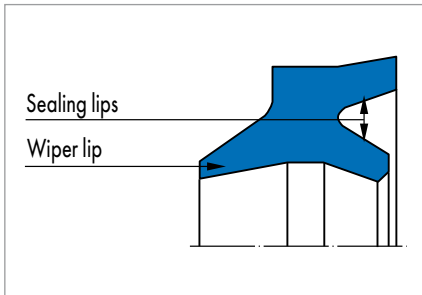


Fig. 1 Merkel Double Wiper PT 9

Product description

Elastomer double wiper especially for large diameters.

Product advantages

The Merkel Double Wiper P 9 exerts inwards the wiping function of a U-ring, and a wiping action outwards against soiling

- Intermediate sizes without mould/tool possible
- Strong wiping action against dirt
- Very good sealing effect against residual film of oil on the extending rod
- Wear-resistant.

Application

Injection moulding machines, presses, large standard cylinders.

The Merkel Double Wiper P 9 is preferably fitted in combination with our rod sealing systems. We recommend in any case the provision of a pressure relieving bore in front of the double wiper in order to avoid a pressure build-up between seal and wiper.

Material

Material	Code	Hardness
Nitrile rubber NBR	85 NBR B247	85 Shore A

Operating conditions

Material	85 NBR B247
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +100
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +100
Running speed v in m/s	1

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 µm	≤6,3 µm
Side of groove	≤3,0 µm	≤15,0 µm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	D	D ₁
16 ... 2000	H10	+0,2

The tolerance for the Ø d is defined by the buffer seal.

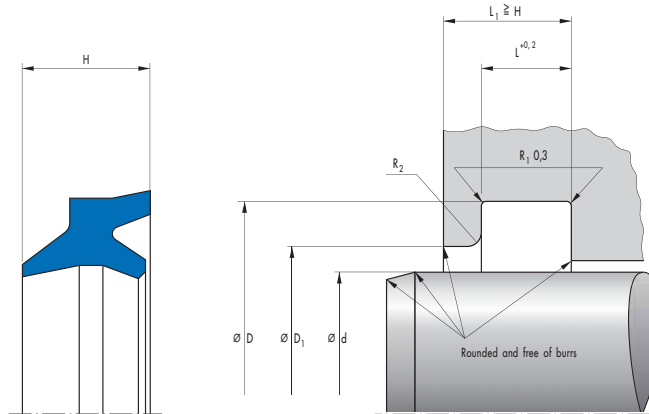
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the Merkel Double Wiper P 9. Generally, wipers can be quickly and easily fitted by deforming into a kidney shape. → Technical Manual.

Article list

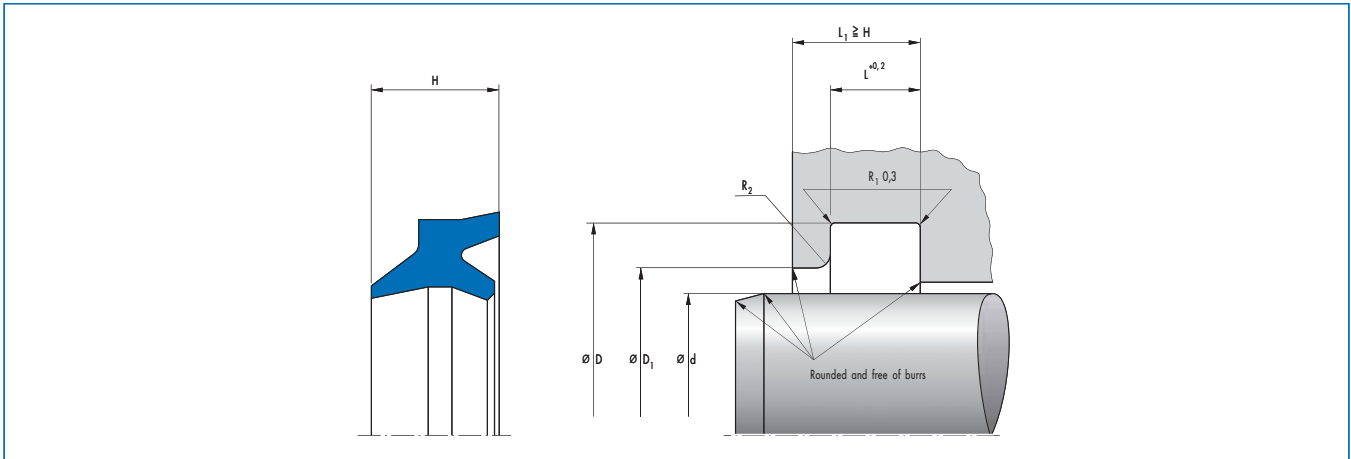


d	D	H	L	D ₁	Profile	R ₂	Material	Article No.	
200	220	18	10,2	210	10	1,5	85 NBR B247	24212749	●
210	230	18	10,2	220	10	1,5	85 NBR B247	24224920	●
220	240	18	10,2	230	10	1,5	85 NBR B247	24224959	●
230	250	18	10,2	240	10	1,5	85 NBR B247	24224931	●
240	260	18	10,2	250	10	1,5	85 NBR B247	24193882	●
250	275	22,5	16	262,6	12,5	2	85 NBR B247	24175461	●
260	285	22,5	16	272,6	12,5	2	85 NBR B247	24224921	●
270	295	22,5	16	282,6	12,5	2	85 NBR B247	24213404	●
280	305	22,5	16	292,6	12,5	2	85 NBR B247	24183892	●
290	315	22,5	16	302,6	12,5	2	85 NBR B247	24224938	○
300	325	22,5	16	312,6	12,5	2	85 NBR B247	24173146	●
310	340	27	18	325	15	3	85 NBR B247	24224922	○
320	350	27	18	335	15	3	85 NBR B247	24224937	●
330	360	27	18	345	15	3	85 NBR B247	24146278	●
340	370	27	18	355	15	3	85 NBR B247	24224930	○
350	380	27	18	365	15	3	85 NBR B247	24147758	●
360	390	27	18	375	15	3	85 NBR B247	24224923	●
370	400	27	18	385	15	3	85 NBR B247	24224929	○
380	410	27	18	395	15	3	85 NBR B247	24149422	●
390	420	27	18	405	15	3	85 NBR B247	24224940	○
400	430	27	18	415	15	3	85 NBR B247	24170712	●
410	440	27	18	425	15	3	85 NBR B247	24224936	○
420	450	27	18	435	15	3	85 NBR B247	24170651	●
430	460	27	18	445	15	3	85 NBR B247	24178040	○
440	470	27	18	455	15	3	85 NBR B247	24224924	●
450	480	27	18	465	15	3	85 NBR B247	24224958	○
460	490	27	18	475	15	3	85 NBR B247	24224942	●
470	500	27	18	485	15	3	85 NBR B247	24224960	○
480	510	27	18	495	15	3	85 NBR B247	24224941	●
490	520	27	18	505	15	3	85 NBR B247	24224957	○
500	530	27	18	515	15	3	85 NBR B247	24224925	●
510	540	27	18	525	15	3	85 NBR B247	24224943	○
520	550	27	18	535	15	3	85 NBR B247	24224956	●
530	560	27	18	545	15	3	85 NBR B247	24224932	○
540	570	27	18	555	15	3	85 NBR B247	24224955	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	D ₁	Profile	R ₂	Material	Article No.	
550	580	27	18	565	15	3	85 NBR B247	24224964	○
560	590	27	18	575	15	3	85 NBR B247	24224954	○
570	600	27	18	585	15	3	85 NBR B247	24224944	○
580	610	27	18	595	15	3	85 NBR B247	24224933	○
590	620	27	18	605	15	3	85 NBR B247	24224945	○
600	630	27	18	615	15	3	85 NBR B247	24224926	○
610	640	27	18	625	15	3	85 NBR B247	24262532	○
620	650	27	18	635	15	3	85 NBR B247	24224953	○
630	660	27	18	645	15	3	85 NBR B247	24222458	●
650	680	27	18	665	15	3	85 NBR B247	24224946	○
660	690	27	18	675	15	3	85 NBR B247	24287716	○
670	700	27	18	685	15	3	85 NBR B247	24224934	○
680	710	27	18	695	15	3	85 NBR B247	24238455	○
690	720	27	18	705	15	3	85 NBR B247	24221251	○
695	725	27	18	610	15	3	85 NBR B247	24296288	○
700	730	27	18	715	15	3	85 NBR B247	24224952	○
710	740	27	18	725	15	3	85 NBR B247	24216448	○
720	750	27	18	735	15	3	85 NBR B247	24224947	○
730	760	27	18	745	15	3	85 NBR B247	49018767	○
740	770	27	18	755	15	3	85 NBR B247	24224951	○
750	780	27	18	765	15	3	85 NBR B247	24233258	○
760	790	27	18	775	15	3	85 NBR B247	24224948	○
770	800	27	18	785	15	3	85 NBR B247	24353518	○
775	805	27	18	790	15	3	85 NBR B247	24295917	○
780	810	27	18	795	15	3	85 NBR B247	24217401	●
790	820	27	18	805	15	3	85 NBR B247	24302433	○
800	830	27	18	815	15	3	85 NBR B247	24215532	●
810	840	27	18	825	15	3	85 NBR B247	24264154	○
820	850	27	18	835	15	3	85 NBR B247	24224935	○
830	860	27	18	845	15	3	85 NBR B247	49003545	○
840	870	27	18	855	15	3	85 NBR B247	24224961	○
850	880	27	18	865	15	3	85 NBR B247	24215590	○
860	890	27	18	875	15	3	85 NBR B247	24224963	○
870	900	27	18	885	15	3	85 NBR B247	24295918	○
880	910	27	18	895	15	3	85 NBR B247	24224962	○
890	920	27	18	905	15	3	85 NBR B247	24297999	○
900	930	27	18	915	15	3	85 NBR B247	24224950	○
920	950	27	18	935	15	3	85 NBR B247	24345992	○
950	980	27	18	965	15	3	85 NBR B247	24233241	○
960	990	27	18	975	15	3	85 NBR B247	24224928	●
970	1000	27	28	985	15	3	85 NBR B247	24361394	○
980	1010	27	18	995	15	3	85 NBR B247	24293775	○
990	1020	27	18	1005	15	3	85 NBR B247	49007878	○
1000	1030	27	18	1015	15	3	85 NBR B247	24215533	●
1020	1050	27	18	1035	15	3	85 NBR B247	24353379	○
1040	1070	27	18	1055	15	3	85 NBR B247	24331194	○
1050	1080	27	18	1065	15	3	85 NBR B247	24306433	○
1060	1090	27	18	1075	15	3	85 NBR B247	24350174	○
1070	1100	27	18	1085	15	3	85 NBR B247	24228839	○
1100	1130	27	18	1115	15	3	85 NBR B247	24250720	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	L	D ₁	Profile	R ₂	Material	Article No.	
1110	1140	27	18	1125	15	3	85 NBR B247	24237246	○
1120	1150	27	18	1135	15	3	85 NBR B247	49017722	○
1130	1160	27	18	1145	15	3	85 NBR B247	24378267	○
1170	1200	27	18	1185	15	3	85 NBR B247	24341374	○
1210	1240	27	18	1225	15	3	85 NBR B247	24362171	○
1220	1250	27	18	1235	15	3	85 NBR B247	24259753	○
1250	1280	27	18	1265	15	3	85 NBR B247	24302041	○
1260	1290	27	18	1275	15	3	85 NBR B247	24342022	○
1300	1330	27	18	1315	15	3	85 NBR B247	24292824	○
1350	1380	27	18	1365	15	3	85 NBR B247	24290793	○
1370	1400	27	18	1385	15	3	85 NBR B247	24332613	○
1380	1410	27	18	1395	15	3	85 NBR B247	24378270	○
1420	1450	27	18	1435	15	3	85 NBR B247	24362130	○
1450	1480	27	18	1465	15	3	85 NBR B247	24302595	○
1560	1590	27	18	1565	15	3	85 NBR B247	532782	○
1580	1610	27	18	1595	15	3	85 NBR B247	24336748	○
1660	1690	27	18	1675	15	3	85 NBR B247	24357172	○
1700	1730	27	18	1715	15	3	85 NBR B247	49019211	○
1750	1780	27	18	1765	15	3	85 NBR B247	24262918	○
1800	1830	27	18	1815	15	3	85 NBR B247	49012005	○
1960	1990	27	18	1975	15	3	85 NBR B247	24259169	○
2000	2030	27	18	2015	15	3	85 NBR B247	24294574	○
2450	2480	27	18	2495	15	3	85 NBR B247	24378197	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Double Wiper PRW 1 with Integrated Pressure Relief

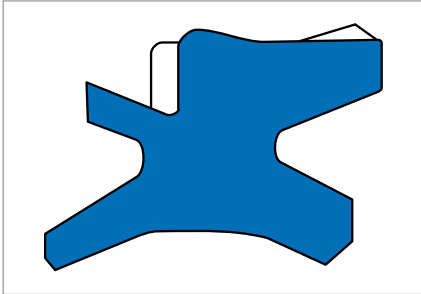


Fig. 1 Merkel Double Wiper PRW 1

Product description

Merkel Double Wiper PRW 1 with integrated pressure-relief function and special sealing and wiping edge geometry.

Product advantages

Double wiper for housings based on ISO 6195 Type A

- No pressure build-up between wiper and rod seal due to integrated pressure relief (patented).
- Improved sealing of overall system due to dynamic sealing lip with punched sealing edge.
- Wiping lip has outstanding wiping action against dirt
- Static sealing lip for additional protection against ingress of dirt and water.

Application

Earth moving equipment, industrial vehicles, loading platforms, agricultural machinery, cranes, support cylinders.

Material

Material	Code	Hardness
Polyurethane	94 AU 925	94 Shore A
Polyurethane	92 AU 21100	92 Shore A

Operating conditions

Material	94 AU 925	92 AU 21100
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +110	-40 ... +100
HFA fluids	+5 ... +50	+5 ... +50
HFB fluids	+5 ... +50	+5 ... +50
HFC fluids	-30 ... +40	-40 ... +40
HFD fluids	-	-
Water	+5 ... +40	+5 ... +40
HETG (rapeseed oil)	-30 ... +60	-40 ... +60
HEES (synthetic esters)	-30 ... +60	-40 ... +80
HEPG (glycol)	-30 ... +40	-40 ... +40
Mineral greases	-30 ... +110	-40 ... +100
Running speed v in m/s	0,6	0,6

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Side of groove	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% up to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The largest gap dimension occurring on the non-pressurised side of the seal in operation is of vital importance for the function of the seal. → Technical Manual.

Profile dimension	Max. permissible gap dimension		
	16 MPa	26 MPa	32 MPa
4,0 ... 5,0	0,50	0,40	0,35
>5,0 ... 7,5	0,55	0,45	0,40

Tolerance recommendation and dimension D2

During the design of D2, the admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into consideration.

→ Technical Manual.

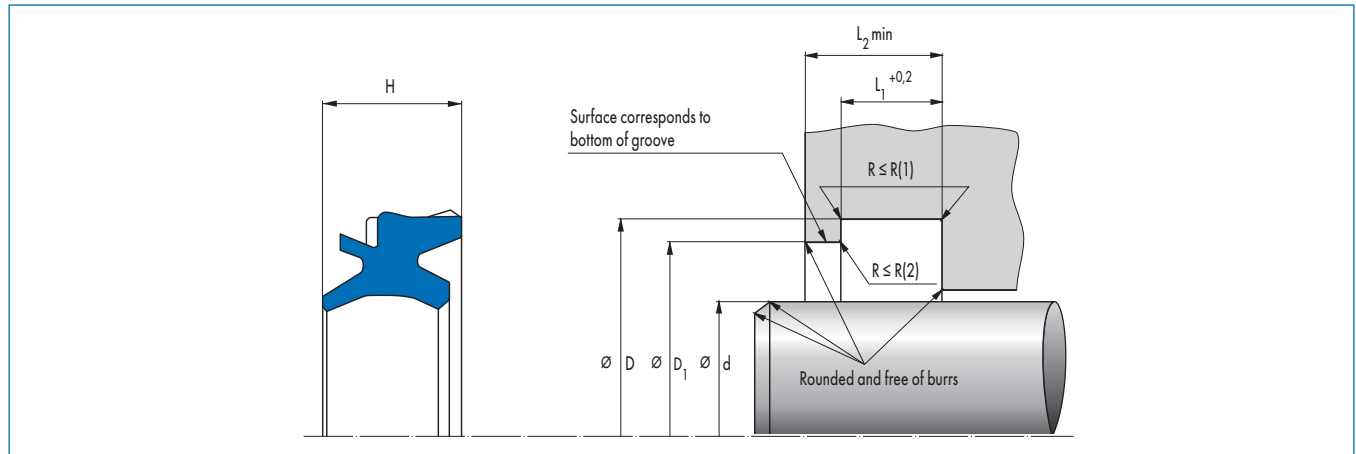
Nominal Ø d	d	D
≤180	f8	H11

Fitting & installation

Careful fitting is a prerequisite for the correct function of the Merkel Double Wiper PRW 1. Generally, wipers can be quickly and easily fitted by deforming into a kidney shape.

→ Technical Manual.

Article list



d	D	D ₁	L ₁	L ₂	R (1)	R (2)	H	Profile	Material	Article No.	
22	30	28	4	6	0,3	0,2	7	4	94 AU 925	49012374	●
25	33	31	4	6	0,3	0,2	7	4	94 AU 925	49012375	●
28	36	34	4	6	0,3	0,2	7	4	94 AU 925	528538	●
30	38	36	4	6	0,3	0,2	7	4	94 AU 925	530000	●
30	38	36	5	6	0,3	0,2	7	5	92 AU 21100	49032529	●
32	40	38	4	6	0,3	0,2	7	4	94 AU 925	531403	●
35	43	41	4	6	0,3	0,2	7	4	94 AU 925	531022	●
36	44	42	4	6	0,3	0,2	7	4	94 AU 925	531411	●
37	45	43	4	6	0,3	0,2	7	4	94 AU 925	49012106	○
38	46	44	4	6	0,3	0,2	7	4	94 AU 925	49005191	●
40	48	46	4	6	0,3	0,2	7	4	94 AU 925	531116	●
45	53	51	4	6	0,3	0,2	7	4	94 AU 925	531412	●
45	53	51	4	7,5	0,3	0,2	7,8	4	94 AU 925	49031586	●
48	58	55	6,3	8,3	0,3	0,3	9	5	94 AU 925	526679	●
50	58	56	4	6	0,3	0,2	7	4	94 AU 925	528607	●
50	60	57	6,3	8,3	0,3	0,3	9	5	94 AU 925	49040950	●
55	63	61	4	6	0,3	0,2	7	4	94 AU 925	528815	●
60	70	67	6,3	8,3	0,3	0,3	9	5	94 AU 925	49024554	●
70	80	77	6,3	8,3	0,3	0,3	9	5	94 AU 925	49022349	●
75	85	82	6,3	8,3	0,3	0,3	9	5	94 AU 925	49040948	○
80	90	87	6,3	8,3	0,3	0,3	9	5	94 AU 925	49005193	○
85	95	92	6,3	8,3	0,3	0,3	9	5	94 AU 925	49005391	●
90	100	97	6,3	8,3	0,3	0,3	9	5	94 AU 925	49040949	○
92	102	99	6,3	8,3	0,3	0,3	9	5	94 AU 925	49005192	●
125	140	135	9,5	12	0,5	0,3	13	7,5	94 AU 925	49042860	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Double Wiper PT 1

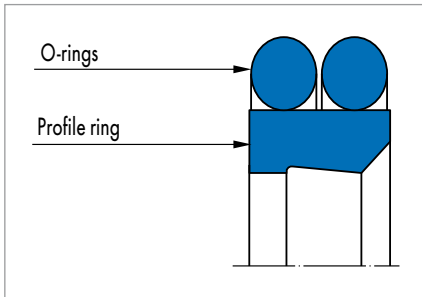


Fig. 1 Merkel Double Wiper PT 1

Product description

Merkel Double Wiper PT 1 consisting of one profile ring made of PTFE with a sealing edge and a wiper edge, as well as two O-rings as sealing and pre-load components.

Product advantages

Double wiper for improvement of total tightness. Merkel Double Wiper PT 1 is preferably fitted in combination with our rod seals Merkel Omegat OMS-MR, Merkel Compact Seal T 20 or Merkel U-Ring LF 300

- Low friction, free of stick-slip
- Excellent regulation and positioning in operation
- Material variants for short stroke and high frequency; available on enquiry
- High reliability, can accept the full operating pressure for short periods.

We recommend a pressure relieving bore. With buffer seals with good deformation value, pressure relief is not necessary. In any case, on the combination of seals without sufficient deformation value, e.g. Merkel Compact Seal NI 300, KI 310 and KI 320, a pressure relieving bore is required.

Application

Industrial vehicles, injection moulding machines, handling equipment, presses, agricultural machinery, mills, control and regulation equipment, large cylinders.

Material

Profile ring

Material	Code
PTFE bronze compound	PTFE B602
PTFE glass/MoS2 compound	PTFE GM201

O-ring

Material	Code	Hardness
Nitrile rubber NBR	NBR	70 Shore A
Fluoro rubber	FKM	70 Shore A

Operating conditions

Material	PTFE B602/ NBR	PTFE B602/ FKM	PTFE GM201/ NBR	PTFE GM201/ FKM
	Temperature range in °C			
Hydraulic oils HL, HLP	-30 ... +100	-10 ... +200	-30 ... +100	-10 ... +150
HFA fluids	-	-	+5 ... +60	+5 ... +60
HFB fluids	-	-	+5 ... +60	+5 ... +60
HFC fluids	-	-	-30 ... +60	-10 ... +40
HFD fluids	-	-10 ... +20	-	-10 ... +150
Water	-	-	+5 ... +100	+5 ... +100
HETG (rapeseed oil)	-30 ... +80	-10 ... +80	-30 ... +80	-10 ... +80
HEES (synthetic esters)	-30 ... +80	-10 ... +100	-30 ... +60	-10 ... +100
HEPG (glycol)	-30 ... +60	-10 ... +80	-30 ... +60	-10 ... +80
Mineral greases	-30 ... +100	-10 ... +200	-30 ... +100	-10 ... +150
Running speed v in m/s	5			

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 µm	≤6,3 µm
Side of groove	≤3,0 µm	≤15,0 µm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal \varnothing d	D	D ₁
20 ... 800	H9	H10

The tolerance for the \varnothing d is defined by the buffer seal.

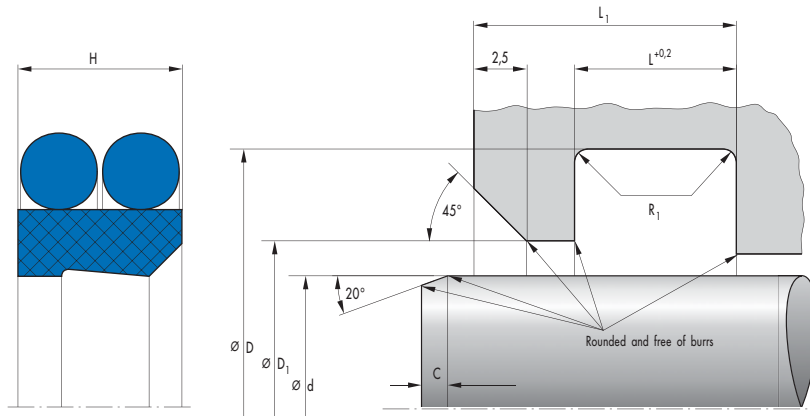
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the Merkel Double Wiper PT 1. Generally, wipers can be quickly and easily fitted by deforming into a kidney shape.
→ Technical Manual.

Article list

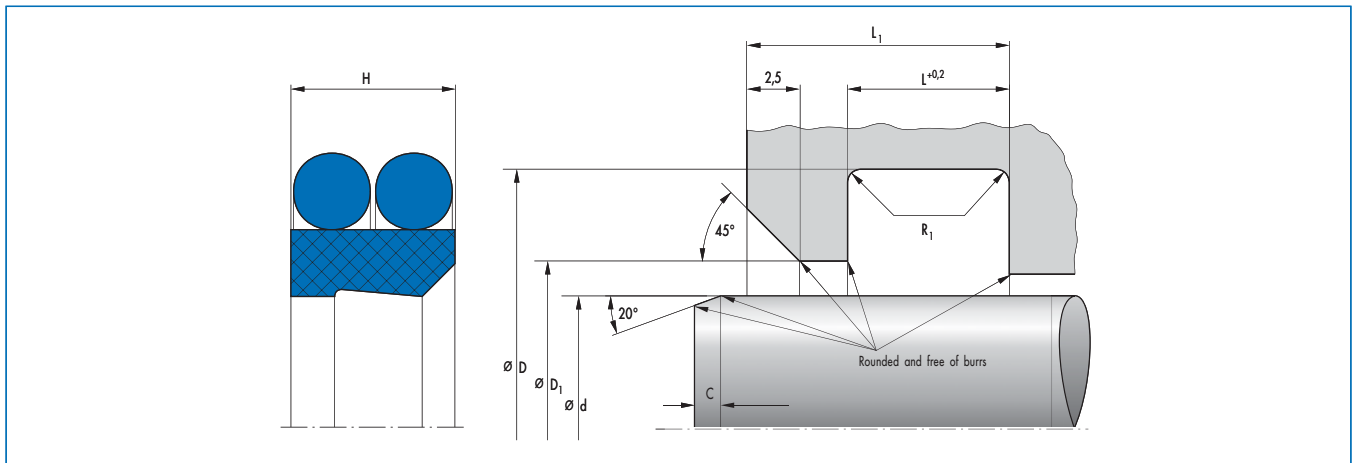


d	D	H	L	L ₁	D ₁	Profile	C	R ₁	Material	Article No.	
20	27,6	4	4,2	8,2	21	3,8	3	0,4	PTFE B602 / NBR	24269429	●
20	27,6	4	4,2	8,2	21	3,8	3	0,4	PTFE GM201 / NBR	24339980	○
25	32,6	4	4,2	8,2	26	3,8	3	0,4	PTFE B602 / NBR	24275331	●
25	32,6	4	4,2	8,2	26	3,8	3	0,4	PTFE B602 / FKM	24275423	●
28	35,6	4	4,2	8,2	29	3,8	3	0,4	PTFE B602 / NBR	24275334	●
28	35,6	4	4,2	8,2	29	3,8	3	0,4	PTFE B602 / FKM	24275426	●
30	37,6	4	4,2	8,2	31	3,8	3	0,4	PTFE B602 / NBR	24275338	●
30	37,6	4	4,2	8,2	31	3,8	3	0,4	PTFE B602 / FKM	24275430	○
32	39,6	4	4,2	8,2	33	3,8	3	0,4	PTFE B602 / NBR	24269656	●
32	39,6	4	4,2	8,2	33	3,8	3	0,4	PTFE B602 / FKM	24275434	○
35	42,6	4	4,2	8,2	36	3,8	3	0,4	PTFE B602 / NBR	24275347	●
35	42,6	4	4,2	8,2	36	3,8	3	0,4	PTFE B602 / FKM	24275439	○
36	43,6	4	4,2	8,2	37	3,8	3	0,4	PTFE B602 / NBR	24275352	●
36	43,6	4	4,2	8,2	37	3,8	3	0,4	PTFE B602 / FKM	24275444	○
40	48,8	6	6,3	10,3	41,5	4,4	3	1,2	PTFE B602 / NBR	24261061	●
40	48,8	6	6,3	10,3	41,5	4,4	3	1,2	PTFE B602 / FKM	24275427	○
42	50,8	6	6,3	10,3	43,5	4,4	3	1,2	PTFE B602 / NBR	24275339	●
42	50,8	6	6,3	10,3	43,5	4,4	3	1,2	PTFE B602 / FKM	24275431	○
45	53,8	6	6,3	10,3	46,5	4,4	3	1,2	PTFE B602 / NBR	24275341	●
45	53,8	6	6,3	10,3	46,5	4,4	3	1,2	PTFE B602 / FKM	24275433	●
50	58,8	6	6,3	10,3	51,5	4,4	3	1,2	PTFE B602 / NBR	24275345	●
50	58,8	6	6,3	10,3	51,5	4,4	3	1,2	PTFE B602 / FKM	24275437	○
50	58,8	6	6,3	10,3	51,5	4,4	3	1,2	PTFE GM201 / FKM	24351716	○
50	58,8	6	6,3	10,3	51,5	4,4	3	1,2	PTFE GM201 / NBR	49004617	○
55	63,8	6	6,3	10,3	56,5	4,4	3	1,2	PTFE B602 / NBR	24300395	●
56	64,8	6	6,3	10,3	57,5	4,4	4	1,2	PTFE B602 / NBR	24275351	●
56	64,8	6	6,3	10,3	57,5	4,4	4	1,2	PTFE B602 / FKM	24275443	○
60	68,8	6	6,3	10,3	61,5	4,4	4	1,2	PTFE GM201 / NBR	531996	○
60	68,8	6	6,3	10,3	61,5	4,4	4	1,2	PTFE B602 / NBR	24269451	●
60	68,8	6	6,3	10,3	61,5	4,4	4	1,2	PTFE B602 / FKM	24275425	●
60	68,8	6	6,3	10,3	61,5	4,4	4	1,2	PTFE GM201 / FKM	24351722	○
63	71,8	6	6,3	10,3	64,5	4,4	4	1,2	PTFE B602 / NBR	24275336	●
63	71,8	6	6,3	10,3	64,5	4,4	4	1,2	PTFE B602 / FKM	24275428	○
65	73,8	6	6,3	10,3	66,5	4,4	4	1,2	PTFE B602 / NBR	24275348	●
65	73,8	6	6,3	10,3	66,5	4,4	4	1,2	PTFE B602 / FKM	24275440	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	L ₁	D ₁	Profile	C	R ₁	Material	Article No.	
65	73,8	6	6,3	10,3	66,5	4,4	4	1,2	PTFE GM201 / NBR	24380154	○
70	82,2	7,7	8,1	12,1	72	6,1	4	2	PTFE B602 / NBR	24275343	●
70	82,2	7,7	8,1	12,1	72	6,1	4	2	PTFE B602 / FKM	24275435	●
70	82,2	7,7	8,1	12,1	72	6,1	4	2	PTFE GM201 / FKM	24351734	○
70	82,2	7,7	8,1	12,1	72	6,1	4	2	PTFE GM201 / NBR	24371776	○
75	87,2	7,7	8,1	12,1	77	6,1	4	2	PTFE B602 / NBR	24275346	●
75	87,2	7,7	8,1	12,1	77	6,1	4	2	PTFE B602 / FKM	24275438	○
80	92,2	7,7	8,1	12,1	82	6,1	4	2	PTFE B602 / NBR	24275350	●
80	92,2	7,7	8,1	12,1	82	6,1	4	2	PTFE B602 / FKM	24275442	●
80	92,2	7,7	8,1	12,1	82	6,1	4	2	PTFE GM201 / FKM	24351705	○
85	97,2	7,7	8,1	12,1	87	6,1	4	2	PTFE B602 / NBR	24275337	●
85	97,2	7,7	8,1	12,1	87	6,1	4	2	PTFE B602 / FKM	24275429	○
85	97,2	7,7	8,1	12,1	87	6,1	4	2	PTFE GM201 / NBR	24380155	○
90	102,2	7,7	8,1	12,1	92	6,1	4	2	PTFE B602 / NBR	24275340	●
90	102,2	7,7	8,1	12,1	92	6,1	4	2	PTFE B602 / FKM	24275432	●
90	102,2	7,7	8,1	12,1	92	6,1	4	2	PTFE GM201 / FKM	24351735	○
100	112,2	7,7	8,1	12,1	102	6,1	4	2	PTFE B602 / NBR	24275349	●
100	112,2	7,7	8,1	12,1	102	6,1	4	2	PTFE B602 / FKM	24275441	●
100	112,2	7,7	8,1	12,1	102	6,1	4	2	PTFE GM201 / FKM	24354911	○
100	112,2	7,7	8,1	12,1	102	6,1	4	2	PTFE GM201 / NBR	24380032	○
105	117,2	7,7	8,1	12,1	107	6,1	6	2	PTFE GM201 / FKM	24350943	○
105	117,2	7,7	8,1	12,1	107	6,1	6	2	PTFE GM201 / NBR	24380095	○
110	122,2	7,7	8,1	12,1	112	6,1	4	2	PTFE B602 / NBR	24275356	●
110	122,2	7,7	8,1	12,1	112	6,1	4	2	PTFE B602 / FKM	24275448	○
110	122,2	7,7	8,1	12,1	112	6,1	4	2	PTFE GM201 / FKM	24351715	○
110	122,2	7,7	8,1	12,1	112	6,1	4	2	PTFE GM201 / NBR	24380092	○
115	127,2	7,7	8,1	12,1	117	6,1	4	2	PTFE B602 / NBR	24275360	●
115	127,2	7,7	8,1	12,1	117	6,1	4	2	PTFE B602 / FKM	24275452	○
115	127,2	7,7	8,1	12,1	117	6,1	4	2	PTFE GM201 / FKM	24359810	○
120	132,2	7,7	8,1	12,1	122	6,1	4	2	PTFE B602 / NBR	24275364	●
120	132,2	7,7	8,1	12,1	122	6,1	4	2	PTFE B602 / FKM	24275456	○
120	132,2	7,7	8,1	12,1	122	6,1	4	2	PTFE GM201 / FKM	24351736	○
125	137,2	7,7	8,1	12,1	127	6,1	6	2	PTFE B602 / NBR	24275365	●
125	137,2	7,7	8,1	12,1	127	6,1	6	2	PTFE B602 / FKM	24275461	○
125	137,2	7,7	8,1	12,1	127	6,1	6	2	PTFE GM201 / FKM	24352301	○
125	137,2	7,7	8,1	12,1	127	6,1	6	2	PTFE GM201 / NBR	24380156	○
130	142,2	7,7	8,1	12,1	132	6,1	6	2	PTFE B602 / NBR	24275374	●
130	142,2	7,7	8,1	12,1	132	6,1	6	2	PTFE B602 / FKM	24275466	○
130	142,2	7,7	8,1	12,1	132	6,1	6	2	PTFE GM201 / FKM	24341216	○
135	147,2	7,7	8,1	12,1	137	6,1	6	2	PTFE GM201 / FKM	24380767	○
140	156	11	11,5	15,5	142	8	6	2	PTFE B602 / NBR	24268086	●
140	156	11	11,5	15,5	142	8	6	2	PTFE B602 / FKM	24275449	○
140	156	11	11,5	15,5	142	8	6	2	PTFE GM201 / FKM	24350944	○
140	156	11	11,5	15,5	142	8	6	2	PTFE GM201 / NBR	49004558	○
145	161	11	11,5	15,5	147	8	6	2	PTFE GM201 / NBR	24380702	○
150	166	11	11,5	15,5	152	8	6	2	PTFE B602 / NBR	24275361	●
150	166	11	11,5	15,5	152	8	6	2	PTFE B602 / FKM	24275453	○
150	166	11	11,5	15,5	152	8	6	2	PTFE GM201 / FKM	24339307	○
150	166	11	11,5	15,5	152	8	6	2	PTFE GM201 / NBR	49005139	○
155	171	11	11,5	15,5	157	8	6	2	PTFE GM201 / NBR	24380703	○

● Available from stock ○ On request: Tool is available, delivery at short notice

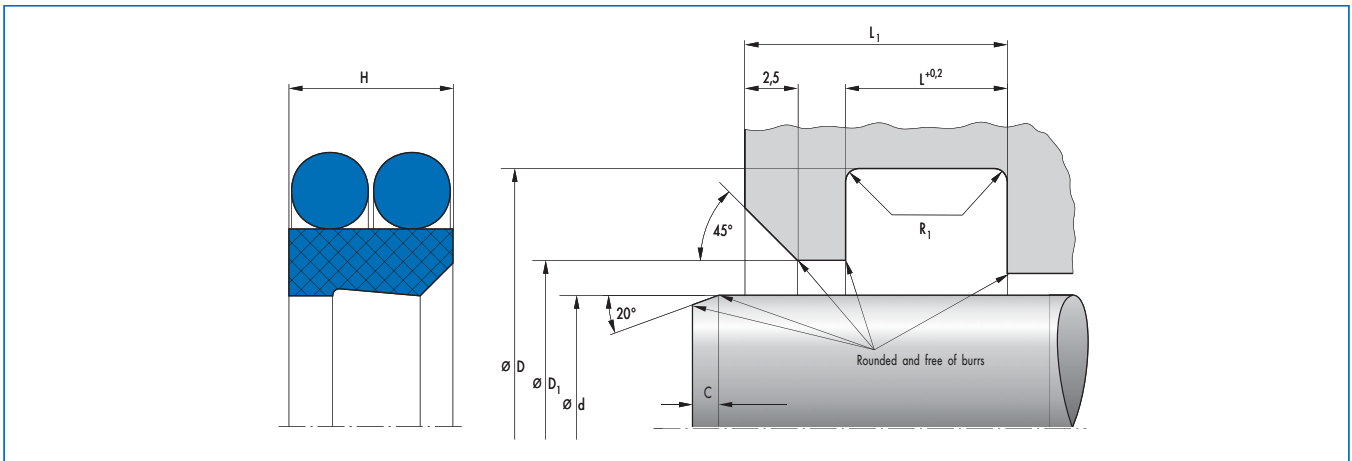


d	D	H	L	L ₁	D ₁	Profile	C	R ₁	Material	Article No.	
160	176	11	11,5	15,5	162	8	6	2	PTFE B602 / FKM	24275455	●
160	176	11	11,5	15,5	162	8	6	2	PTFE GM201 / FKM	24350945	○
160	176	11,5	11,5	15,5	162	8	6	2	PTFE B602 / NBR	24275363	●
170	186	11	11,5	15,5	172	8	6	2	PTFE B602 / NBR	24275367	●
170	186	11	11,5	15,5	172	8	6	2	PTFE B602 / FKM	24275459	○
170	186	11	11,5	15,5	172	8	6	2	PTFE GM201 / FKM	24351743	○
170	186	11	11,5	15,5	172	8	6	2	PTFE GM201 / NBR	24380704	○
180	196	11	11,5	15,5	182	8	6	2	PTFE B602 / NBR	24275373	●
180	196	11	11,5	15,5	182	8	6	2	PTFE GM201 / FKM	24350946	○
180	196	11,5	11,5	15,5	182	8	6	2	PTFE B602 / FKM	24275465	○
190	206	11	11,5	15,5	192	8	6	2	PTFE GM201 / FKM	24352303	○
200	216	11	11,5	15,5	202	8	6	2	PTFE B602 / NBR	24275358	●
200	216	11	11,5	15,5	202	8	6	2	PTFE B602 / FKM	24275450	○
200	216	11	11,5	15,5	202	8	6	2	PTFE GM201 / FKM	24351701	○
210	226	11	11,5	15,5	212	8	6	2	PTFE GM201 / NBR	24380705	○
220	236	11	11,5	15,5	222	8	8	2	PTFE B602 / NBR	24274581	●
220	236	11	11,5	15,5	222	8	8	2	PTFE B602 / FKM	24275457	○
220	236	11	11,5	15,5	222	8	8	2	PTFE GM201 / FKM	24351714	○
220	236	11	11,5	15,5	222	8	8	2	PTFE GM201 / NBR	49002400	○
230	246	11	11,5	15,5	232	8	8	2	PTFE B602 / NBR	24275368	●
230	246	11	11,5	15,5	232	8	8	2	PTFE B602 / FKM	24275460	○
230	246	11	11,5	15,5	232	8	8	2	PTFE GM201 / FKM	24351787	○
230	246	11	11,5	15,5	232	8	8	2	PTFE GM201 / NBR	49004618	○
240	256	11	11,5	15,5	242	8	8	2	PTFE GM201 / NBR	533355	○
240	256	11	11,5	15,5	242	8	8	2	PTFE B602 / NBR	24275372	●
240	256	11	11,5	15,5	242	8	8	2	PTFE B602 / FKM	24275464	○
245	261	11	11,5	15,5	247	8	8	2	PTFE B602 / NBR	24377708	○
250	266	11	11,5	15,5	252	8	8	2	PTFE B602 / NBR	24275359	●
250	266	11	11,5	15,5	252	8	8	2	PTFE B602 / FKM	24275451	○
250	266	11	11,5	15,5	252	8	8	2	PTFE GM201 / NBR	49009052	○
260	276	9	9,5	13,5	262	8	8	2	PTFE GM201 / NBR	24375451	○
260	276	11	11,5	15,5	262	8	8	2	PTFE B602 / NBR	24275362	●
260	276	11	11,5	15,5	262	8	8	2	PTFE B602 / FKM	24275454	○
265	281	11	11,5	15,5	267	8	8	2	PTFE GM201 / FKM	24351788	○
280	296	11	11,5	15,5	282	8	8	2	PTFE B602 / NBR	24275371	●
280	296	11	11,5	15,5	282	8	8	2	PTFE B602 / FKM	24275463	○
280	296	11	11,5	15,5	282	8	8	2	PTFE GM201 / FKM	24351702	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	L ₁	D ₁	Profile	C	R ₁	Material	Article No.	
280	296	11	11,5	15,5	282	8	8	2	PTFE GM201 / NBR	49004005	○
290	306	11	11,5	15,5	292	8	8	2	PTFE B602 / FKM	24275467	○
300	316	11	11,5	15,5	302	8	8	2	PTFE B602 / NBR	24275376	●
300	316	11	11,5	15,5	302	8	8	2	PTFE B602 / FKM	24275468	○
300	316	11	11,5	15,5	302	8	8	2	PTFE GM201 / FKM	24374010	○
310	326	11	11,5	15,5	312	8	8	2	PTFE B602 / FKM	24348310	○
310	326	11	11,5	15,5	312	8	8	2	PTFE GM201 / NBR	49009461	○
320	336	11	11,5	15,5	322	8	8	2	PTFE B602 / NBR	24296543	○
320	336	11	11,5	15,5	322	8	8	2	PTFE B602 / FKM	24342120	○
320	336	11	11,5	15,5	322	8	8	2	PTFE GM201 / FKM	24351378	○
320	336	11	11,5	15,5	322	8	8	2	PTFE GM201 / NBR	49010398	○
330	346	11	11,5	15,5	332	8	8	2	PTFE GM201 / NBR	49004619	○
335	351	11	11,5	15,5	337	8	8	2	PTFE GM201 / NBR	49008975	○
340	356	11	11,5	15,5	342	8	8	2	PTFE B602 / NBR	24338668	●
340	356	11	11,5	15,5	342	8	8	2	PTFE B602 / FKM	24345965	○
340	356	11	11,5	15,5	342	8	8	2	PTFE GM201 / FKM	24351898	○
350	366	11	11,5	15,5	352	8	8	2	PTFE B602 / FKM	24342121	○
350	366	11	11,5	15,5	352	8	8	2	PTFE GM201 / FKM	24351703	○
355	371	11	11,5	15,5	357	8	8	2	PTFE B602 / NBR	24377706	○
360	376	11	11,5	15,5	362	8	8	2	PTFE B602 / NBR	24289854	●
360	376	11	11,5	15,5	362	8	8	2	PTFE GM201 / NBR	49009462	○
370	386	11	11,5	15,5	372	8	8	2	PTFE B602 / NBR	24342976	○
375	391	11	11,5	15,5	377	8	8	2	PTFE B602 / NBR	24346725	○
380	396	11	11,5	15,5	382	8	8	2	PTFE B602 / NBR	24343755	○
390	406	11	11,5	15,5	392	8	8	2	PTFE B602 / NBR	24351468	○
400	416	11	11,5	15,5	402	8	8	2	PTFE B602 / FKM	24338879	○
400	416	11	11,5	15,5	402,5	8	8	2	PTFE GM201 / FKM	24351704	○
400	424	14,8	15,5	19,5	402,5	12	8	2	PTFE B602 / NBR	24345418	○
400	424	14,8	15,5	19,5	402,5	12	8	2	PTFE GM201 / NBR	49012517	○
410	434	14,8	15,5	19,5	412,5	12	8	2	PTFE B602 / NBR	532389	○
420	444	14,8	15,5	19,5	422,5	12	8	2	PTFE B602 / NBR	24353639	○
420	444	14,8	15,5	19,5	422,5	12	8	2	PTFE GM201 / NBR	49008822	○
430	454	14,8	15,5	19,5	432,5	12	8	2	PTFE B602 / NBR	24348077	○
440	464	14,8	15,5	19,5	442,5	12	8	2	PTFE GM201 / FKM	526025	○
440	464	14,8	15,5	19,5	442,5	12	8	2	PTFE B602 / NBR	24378393	○
445	469	14,8	15,5	19,5	447,5	12	8	2	PTFE GM201 / NBR	49004004	○
450	474	14,8	15,5	19,5	452,5	12	8	2	PTFE B602 / NBR	24345800	○
460	484	14,8	15,5	19,5	462,5	12	8	2	PTFE B602 / NBR	24344532	○
465	489	14,8	15,5	19,5	467,5	12	8	2	PTFE GM201 / NBR	49009443	○
470	494	14,8	15,5	19,5	472,5	12	8	2	PTFE B602 / NBR	24370827	○
475	499	14,8	15,5	19,5	477,5	12	8	2	PTFE GM201 / NBR	49012518	○
495	519	14,8	15,5	19,5	497,5	12	8	2	PTFE GM201 / NBR	49010394	○
510	534	14,8	15,5	19,5	512,5	12	8	2	PTFE B602 / NBR	24372882	○
510	534	14,8	15,5	19,5	512,5	12	8	2	PTFE GM201 / FKM	49006826	○
520	544	14,8	15,5	19,5	522,5	12	8	2	PTFE B602 / NBR	24345673	○
520	544	14,8	15,5	19,5	522,5	12	8	2	PTFE GM201 / NBR	49008973	○
525	549	14,8	15,5	19,5	527,5	12	8	2	PTFE GM201 / NBR	49012519	○
530	554	14,8	15,5	19,5	532,5	12	8	2	PTFE B602 / FKM	24370401	○
540	564	14,8	15,5	19,5	542,5	12	8	2	PTFE B602 / NBR	24369294	○
570	594	14,8	15,5	19,5	572,5	12	8	2	PTFE GM201 / NBR	49009444	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	L	L ₁	D ₁	Profile	C	R ₁	Material	Article No.	
585	609	14,8	15,5	19,5	587,5	12	8	2	PTFE GM201 / NBR	49012520	○
590	614	14,8	15,5	19,5	592,5	12	8	2	PTFE B602 / FKM	24328251	○
590	614	14,8	15,5	19,5	592,5	12	8	2	PTFE B602 / NBR	24377862	○
600	624	14,8	15,5	19,5	602,5	12	8	2	PTFE B602 / NBR	24374052	○
620	644	14,8	15,5	19,5	622,5	12	8	2	PTFE B602 / NBR	24370196	○
635	659	14,8	15,5	19,5	637,5	12	8	2	PTFE GM201 / NBR	49012435	○
675	702,3	17,2	18	22	677,5	13,7	11	2	PTFE GM201 / NBR	49012436	○
690	717,3	17,2	18	22	692,5	13,7	11	2	PTFE B602 / NBR	528033	○
745	772,3	17,2	18	22	747,5	13,7	11	2	PTFE GM201 / NBR	49012437	○
800	827,3	17,2	18	22	802,5	13,7	11	2	PTFE B602 / NBR	24348235	○
815	842,3	17,2	18	22	817,5	13,7	11	2	PTFE GM201 / NBR	49012438	○
900	927,3	17,2	18	22	902,5	13,7	11	2	PTFE B602 / NBR	526605	○
910	937,3	17,2	18	22	912,5	13,7	11	2	PTFE GM201 / NBR	49012439	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Double Wiper PT 2

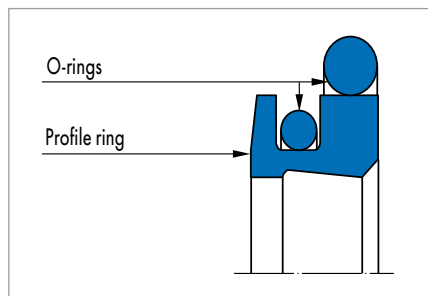


Fig. 1 Merkel Double Wiper PT 2

Product description

Merkel Double Wiper PT 2 consisting of one profile ring made from PTFE with a sealing edge and a wiper edge, as well as two O-rings as sealing and pre-load components.

Product advantages

Double wiper for improvement of total tightness. The Merkel Double Wiper PT 2 is mainly fitted in combination with our rod seals Merkel Omegat OMS-S. A pressure relieving bore is to be provided between seal and wiper

- Excellent regulation and positioning in operation
- Low friction, free of stick-slip
- Material variants for short stroke and high frequency; available on enquiry
- Especially suitable for large diameters.

Application

Injection moulding machines, presses, mills, steel hydraulics engineering.

Material

Profile ring

Material	Code
PTFE bronze compound	PTFE B602

O-ring

Material	Code	Hardness
Nitrile rubber NBR	NBR	70 Shore A
Fluoro rubber	FKM	70 Shore A

Operating conditions

Material	85 NBR B247	85 FKM K664
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-10 ... +200
HFA fluids	-	-
HFB fluids	-	-
HFC fluids	-	-
HFD fluids	-	-10 ... +200
Water	-	-
HETG (rapeseed oil)	-30 ... +80	-10 ... +80
HEES (synthetic esters)	-30 ... +80	-10 ... +100
HEPG (glycol)	-30 ... +60	-10 ... +80
Mineral greases	-30 ... +100	-10 ... +200
Running speed v in m/s	5	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 μm	≤6,3 μm
Side of groove	≤3,0 μm	≤15,0 μm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal \varnothing d	D	D ₁
100 ... 1200	H8	H8

The tolerance for the \varnothing d is defined by the buffer seal.

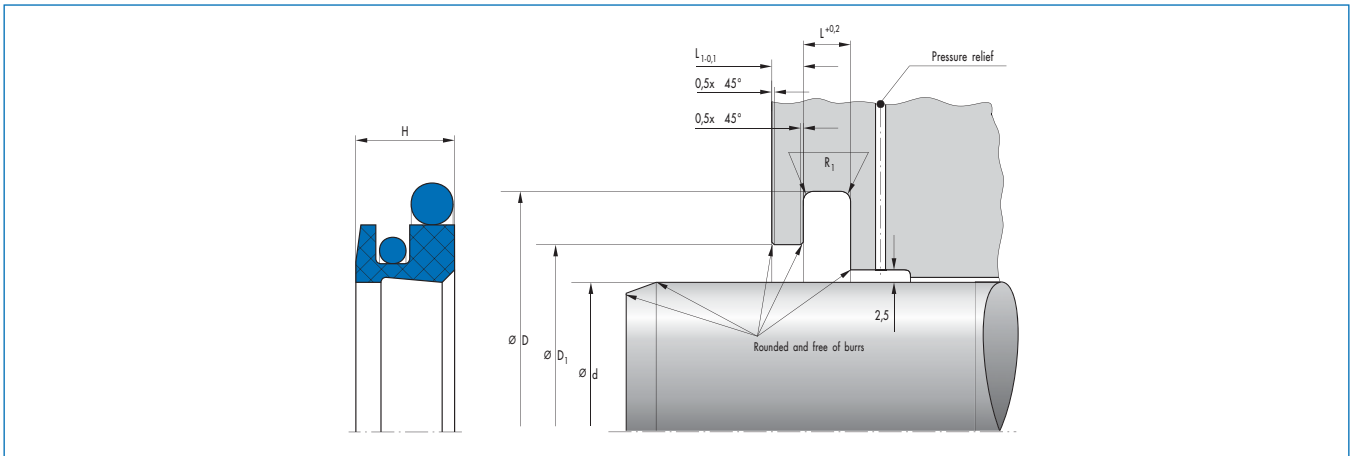
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

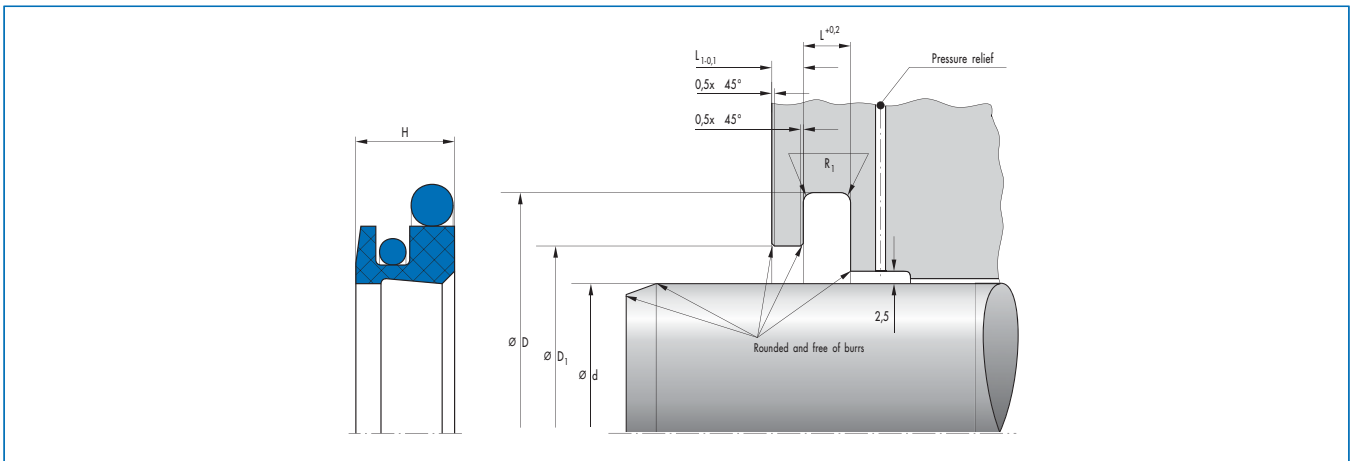
Careful fitting is a prerequisite for the correct function of the Merkel Double Wiper PT 2. Generally, wipers can be quickly and easily fitted by deforming into a kidney shape. → Technical Manual. For diameters from >100 mm to 150 mm, a fitting tool is required. Under 100 mm, no fitting in plunge-cut groove is possible.

Article list



d	D	H	L	L ₁	D ₁	Profile	R ₁	Material	Article No.	
100	122,2	13,5	6,3	4,2	110,7	11,1	1,2	PTFE B602 / NBR	24359838	●
100	122,2	13,5	6,3	4,2	110,7	11,1	1,2	PTFE B602 / FKM	49025565	○
101,6	123,8	13,5	6,3	4,2	112,3	11,1	1,2	PTFE B602 / FKM	24367430	○
110	132,2	13,5	6,3	4,2	120,7	11,1	1,2	PTFE B602 / FKM	24360999	○
110	132,2	13,5	6,3	4,2	120,7	11,1	1,2	PTFE B602 / NBR	24361474	●
120	142,2	13,5	6,3	4,2	130,7	11,1	1,2	PTFE B602 / NBR	24357224	●
125	147,2	13,5	6,3	4,2	135,7	11,1	1,2	PTFE B602 / NBR	24373115	○
125	147,2	13,5	6,3	4,2	135,7	11,1	1,2	PTFE B602 / FKM	49024812	○
130	152,2	13,5	6,3	4,2	140,7	11,1	1,2	PTFE B602 / FKM	24358280	○
130	152,2	13,5	6,3	4,2	140,7	11,1	1,2	PTFE B602 / NBR	24361475	○
139,7	161,9	13,5	6,3	4,2	150,4	11,1	1,2	PTFE B602 / NBR	24361457	○
140	162,2	13,5	6,3	4,2	150,7	11,1	1,2	PTFE B602 / FKM	529583	○
140	162,2	13,5	6,3	4,2	150,7	11,1	1,2	PTFE B602 / NBR	24344542	●
150	172,2	13,5	6,3	4,2	160,7	11,1	1,2	PTFE B602 / FKM	24357793	○
150	172,2	13,5	6,3	4,2	160,7	11,1	1,2	PTFE B602 / NBR	24360778	●
160	182,2	13,5	6,3	4,2	170,7	11,1	1,2	PTFE B602 / NBR	24347042	●
160	182,2	13,5	6,3	4,2	170,7	11,1	1,2	PTFE B602 / FKM	24348020	○
170	192,2	13,5	6,3	4,2	180,7	11,1	1,2	PTFE B602 / NBR	24344540	○
170	192,2	13,5	6,3	4,2	180,7	11,1	1,2	PTFE B602 / FKM	24357223	○
180	202,2	13,5	6,3	4,2	190,7	11,1	1,2	PTFE B602 / NBR	24350643	○
180	202,2	13,5	6,3	4,2	190,7	11,1	1,2	PTFE B602 / FKM	24357393	○
190	212,2	13,5	6,3	4,2	200,7	11,1	1,2	PTFE B602 / NBR	24368087	○
200	222,2	13,5	6,3	4,2	210,7	11,1	1,2	PTFE B602 / NBR	24353154	●
210	232,2	13,5	6,3	4,2	220,7	11,1	1,2	PTFE B602 / NBR	24375895	○
220	242,2	13,5	6,3	4,2	230,7	11,1	1,2	PTFE B602 / NBR	24353169	○
228,6	250,8	13,5	6,3	4,2	239,3	11,1	1,2	PTFE B602 / NBR	24360117	○
230	254,2	13,5	6,3	4,2	240,7	12,1	1,2	PTFE B602 / NBR	24355054	○
240	264,2	13,5	6,3	4,2	250,7	12,1	1,2	PTFE B602 / NBR	24356322	○
250	274,2	13,5	6,3	4,2	260,7	12,1	1,2	PTFE B602 / NBR	24371138	○
260	284,2	13,5	6,3	4,2	270,7	12,1	1,2	PTFE B602 / NBR	24352166	○
275	299,2	13,5	6,3	4,2	285,7	12,1	1,2	PTFE B602 / NBR	24351463	○
280	304,2	13,5	6,3	4,2	290,7	12,1	1,2	PTFE B602 / NBR	24360995	○
290	314,2	13,5	6,3	4,2	300,7	12,1	1,2	PTFE B602 / NBR	49026457	○
295	319,2	13,5	6,3	4,2	305,7	12,1	1,2	PTFE B602 / NBR	24359585	○
300	333	18,4	8,1	6,3	310,7	16,5	1,2	PTFE B602 / NBR	24348115	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	L	L ₁	D ₁	Profile	R ₁	Material	Article No.	
300	333	18,4	8,1	6,3	315,1	16,5	1,2	PTFE B602 / FKM	24356968	○
320	353	18,4	8,1	6,3	335,1	16,5	1,2	PTFE B602 / NBR	524609	○
330,2	363,2	18,4	8,1	6,3	345,3	16,5	1,2	PTFE B602 / NBR	24358312	○
340	373	18,4	8,1	6,3	355,1	16,5	1,2	PTFE B602 / NBR	526102	○
340	373	18,4	8,1	6,3	355,1	16,5	1,2	PTFE B602 / FKM	24358735	○
350	383	18,4	8,1	6,3	365,1	16,5	1,2	PTFE B602 / NBR	24337999	○
350	383	18,4	8,1	6,3	365,1	16,5	1,2	PTFE B602 / FKM	49027323	○
360	393	18,4	8,1	6,3	375,1	16,5	1,2	PTFE B602 / NBR	24331443	●
370	403	18,4	8,1	6,3	385,1	16,5	1,2	PTFE B602 / NBR	24344424	○
380	413	18,4	8,1	6,3	395,1	16,5	1,2	PTFE B602 / NBR	24346896	●
380	413	18,4	8,1	6,3	395,1	16,5	1,2	PTFE B602 / FKM	49035995	○
385	418	18,4	8,1	6,3	400,1	16,5	1,2	PTFE B602 / NBR	24353627	○
400	433	18,4	8,1	6,3	415,1	16,5	1,2	PTFE B602 / NBR	24353007	○
400	433	18,4	8,1	6,3	415,1	16,5	1,2	PTFE B602 / FKM	49016772	○
420	453	18,4	8,1	6,3	435,1	16,5	1,2	PTFE B602 / NBR	24331444	○
430	463	18,4	8,1	6,3	445,1	16,5	1,2	PTFE B602 / NBR	24354755	○
431,8	464,8	18,4	8,1	6,3	446,9	16,5	1,2	PTFE B602 / NBR	24342995	○
440	473	18,4	8,1	6,3	455,1	16,5	1,2	PTFE B602 / NBR	24363240	○
450	483	18,4	8,1	6,3	465,1	16,5	1,2	PTFE B602 / NBR	24358970	○
470	503	18,4	8,1	6,3	485,1	16,5	1,2	PTFE B602 / FKM	24327546	○
470	503	18,4	8,1	6,3	485,1	16,5	1,2	PTFE B602 / NBR	49033427	○
480	513	18,4	8,1	6,3	495,1	16,5	1,2	PTFE B602 / NBR	24338000	●
500	533	18,4	8,1	6,3	515,1	16,5	1,2	PTFE B602 / FKM	24347054	○
500	533	18,4	8,1	6,3	515,1	16,5	1,2	PTFE B602 / NBR	24360955	●
510	543	18,4	8,1	6,3	525,1	16,5	1,2	PTFE B602 / NBR	24372692	○
520	553	18,4	8,1	6,3	535,1	16,5	1,2	PTFE B602 / FKM	24370787	○
530	563	18,4	8,1	6,3	545,1	16,5	1,2	PTFE B602 / NBR	24363241	○
540	573	18,4	8,1	6,3	555,1	16,5	1,2	PTFE B602 / FKM	24371034	○
550	583	18,4	8,1	6,3	555,1	16,5	1,2	PTFE B602 / NBR	24362840	○
550	583	18,4	8,1	6,3	555,1	16,5	1,2	PTFE B602 / FKM	49044471	○
560	593	18,4	8,1	6,3	575,1	16,5	1,2	PTFE B602 / FKM	533488	○
560	593	18,4	8,1	6,3	575,1	16,5	1,2	PTFE B602 / NBR	24339610	○
600	633	18,4	8,1	6,3	615,1	16,5	1,2	PTFE B602 / NBR	24331445	○
620	656,5	19,8	9,5	6,3	635,1	18,25	2	PTFE B602 / NBR	49014759	○
630	666,5	19,8	9,5	6,3	645,1	18,25	2	PTFE B602 / NBR	24349708	○
640	676,5	19,8	9,5	6,3	655,1	18,25	2	PTFE B602 / NBR	24348256	●
640	676,5	19,8	9,5	6,3	655,1	18,25	2	PTFE B602 / FKM	24357491	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	L	L ₁	D ₁	Profile	R ₁	Material	Article No.	
670	706,5	19,8	9,5	6,3	685,1	18,25	2	PTFE B602 / NBR	24346164	●
680	716,5	19,8	9,5	6,3	695,1	18,25	2	PTFE B602 / NBR	24341038	○
700	736,5	19,8	9,5	6,3	715,1	18,25	2	PTFE B602 / NBR	49035756	○
730	766,5	19,8	9,5	6,3	745,1	18,25	2	PTFE B602 / NBR	531292	○
740	776,5	19,8	9,5	6,3	755,1	18,25	2	PTFE B602 / FKM	529324	○
740	776,5	19,8	9,5	6,3	755,1	18,25	2	PTFE B602 / NBR	24344400	○
748	784,5	19,8	9,5	6,3	763,1	18,25	2	PTFE B602 / NBR	49035130	○
749	785,5	19,8	9,5	6,3	764,1	18,25	2	PTFE B602 / NBR	49009337	○
750	786,5	19,8	9,5	6,3	765,1	18,25	2	PTFE B602 / NBR	24367379	○
770	806,5	19,8	9,5	6,3	785,1	18,25	2	PTFE B602 / FKM	24353425	○
790	826,5	19,8	9,5	6,3	805,1	18,25	2	PTFE B602 / NBR	24368078	○
795	831,5	19,8	9,5	6,3	810,1	18,25	2	PTFE B602 / NBR	24344331	○
800	836,5	19,8	9,5	6,3	815,1	18,25	2	PTFE B602 / NBR	24341037	○
800	836,5	19,8	9,5	6,3	815,1	18,25	2	PTFE B602 / FKM	24358811	○
820	856,5	19,8	9,5	6,3	835,1	18,25	2	PTFE B602 / NBR	24349213	○
820	856,5	19,8	9,5	6,3	835,1	18,25	2	PTFE B602 / FKM	24357495	○
830	866,5	19,8	9,5	6,3	845,1	18,25	2	PTFE B602 / NBR	24344384	○
850	886,5	19,8	9,5	6,3	865,1	18,25	2	PTFE B602 / NBR	24314623	●
860	896,5	19,8	9,5	6,3	875,1	18,25	2	PTFE B602 / NBR	24374444	○
900	936,5	19,8	9,5	6,3	915,1	18,25	2	PTFE B602 / NBR	24374392	○
950	986,5	19,8	9,5	6,3	965,1	18,25	2	PTFE B602 / NBR	24356339	○
950	986,5	19,8	9,5	6,3	965,1	18,25	2	PTFE B602 / FKM	24357110	○
970	1006,5	19,8	9,5	6,3	985,1	18,25	2	PTFE B602 / NBR	24359661	○
1130	1166,5	19,8	9,5	6,3	1145,1	18,25	2	PTFE B602 / NBR	530018	○
1160	1196,5	19,8	9,5	6,3	1175,1	18,25	2	PTFE B602 / NBR	24371028	○
1320	1356,5	19,8	9,5	6,3	1335,1	18,25	2	PTFE B602 / NBR	527134	○
1375	1411,5	19,8	9,5	6,3	1390,1	18,25	2	PTFE B604 / NBR	49004721	○
1500	1536,5	19,8	9,5	6,3	1515,1	18,25	2	PTFE B604 / NBR	49006761	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Double Wiper PU 11

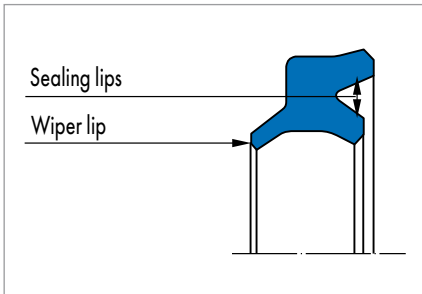


Fig. 1 Merkel Double Wiper PU 11

Product description

U-ring with wiper lip (double-lip wiper); sealing edge of wiper lip lightly rounded.

Product advantages

Double wiper for improvement of total tightness; dimensions also for standardised housing according to ISO 6195 Type C

- Sealing lips pointing inwards fulfil the function of a U-ring
- Wiper lip with lightly rounded sealing edge reliably wipes away dirt and leaves a residual oil film on the retracting rod
- Tightness, service life and friction behaviour of the entire system are improved.

Merkel Double Wiper PU 11 is preferably fitted in combination with our rod seals Merkel Omegat OMS-MR. The double-lip wiper can take pressures up to 1,6 MPa. If higher pressures can build, up we recommend a pressure relieving bore between seal and wiper.

Application

Industrial vehicles, injection moulding machines, standard cylinders.

Material

Material	Code	Hardness
Polyurethane	95 AU V142	95 Shore A

Operating conditions

Material	95 AU V142
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Running speed v in m/s	1

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	*	*
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

* Surface roughness of the sliding surface to suit the sealing component used.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	D	D ₁
12 ... 200	H11	H11

The tolerance for the Ø d is defined by the buffer seal.

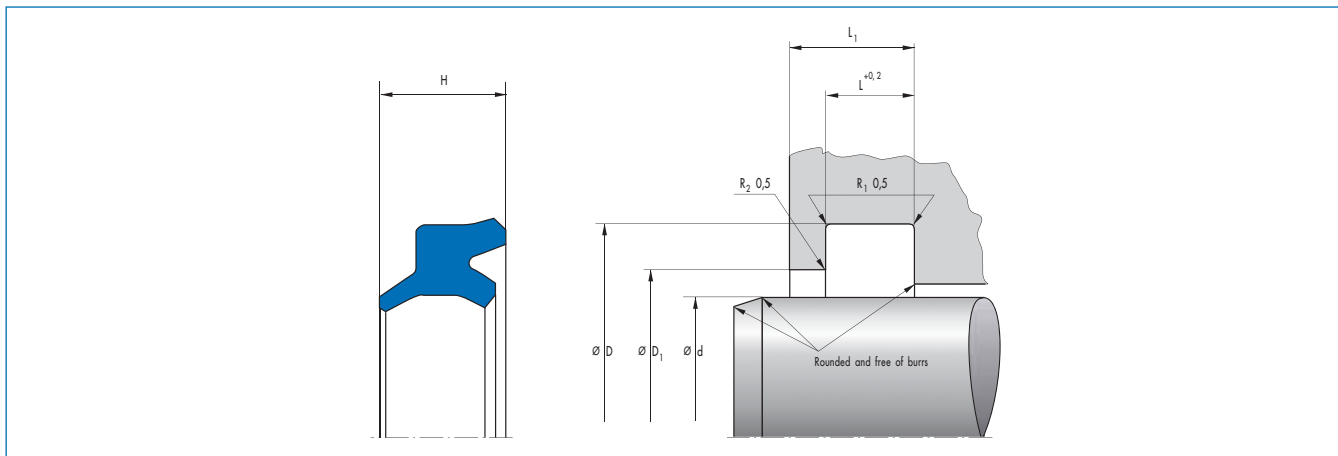
Lead-in chamfers

Length and angle are to be designed to suit the rod seal used.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the Merkel Double Wiper PU 11. Generally, wipers can be quickly and easily fitted by deforming into a kidney shape.
→ Technical Manual.

Article list



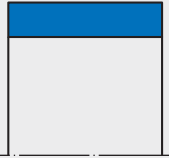
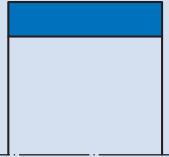
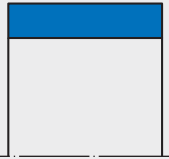

d	D	L	L ₁	H	D ₁	Profile	Material	Article No.	
12	18	4	6	6	14,5	3	95 AU V142	24348683	●
14	20	4	6	6	16,5	3	95 AU V142	24348684	●
16	22	4	6	6	18,5	3	95 AU V142	24338682	○
18	24	4	6	6	20,5	3	95 AU V142	24338683	●
22	28	4	6	6	24,5	3	95 AU V142	24314567	●
25	31	4	6	6	27,5	3	95 AU V142	49003027	○
28	36	5	7	7,5	31	4	95 AU V142	24294432	●
30	38	5	7	7,5	33	4	95 AU V142	49003028	○
36	44	5	7	7,5	39	4	95 AU V142	24311422	●
40	48	5	7	7,5	43	4	95 AU V142	24360973	○
45	53	5	7	7,5	48	4	95 AU V142	24338684	●
50	58	5	7	7,5	53	4	95 AU V142	49003029	○
55	65	6	8	8,5	58	5	95 AU V142	49000803	○
56	66	6	8	8,5	59	5	95 AU V142	24314566	●
60	70	6	8	8,5	63	5	95 AU V142	49003030	○
65	75	6	8	8,5	68	5	95 AU V142	49000804	○
70	80	6	8	8,5	73	5	95 AU V142	24338685	●
75	85	6	8	8,5	78	5	95 AU V142	49000806	○
80	90	6	8	8,5	83	5	95 AU V142	24369056	○
90	100	6	8	8,5	93	5	95 AU V142	24338686	●
110	125	8,5	10,5	12	114	7,5	95 AU V142	24338687	●
140	155	8,5	10,5	12	144	7,5	95 AU V142	24348685	●
150	165	8,5	10,5	12	154	7,5	95 AU V142	529428	○
170	185	8,5	10,5	12	174	7,5	95 AU V142	24349427	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Pre-Selection Hydraulics – Guides


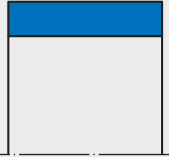
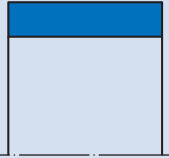
Temperature figures refer to mineral oils. Due to the large choice of media with different and varying additives, which is not always easily comprehensible, the above operating limits are only recommended values. We recommend testing resistance in the specific case.

Individual instances of the operating limits stated may be exceeded taking into account the related operating conditions. With a long duty cycle, stop-start operation or other difficult operating conditions it is recommended that these values are not simultaneously exploited to the full.

Seal		Standard		
Type	Material	DIN/ISO	Examples of use	
Merkel Guide Ring SB 	Hard fabric	10766	High load-bearing capacity, universally applicable.	
Merkel Guide Ring KB 	Hard fabric	10766	High load-bearing capacity, universally applicable.	
Merkel Guide Strip SF 	PTFE bronze	10766	Free of stick-slip, good damping and emergency running characteristics.	
Merkel Guide Strip SF 	PTFE bronze	10766	Free of stick-slip, good damping and emergency running characteristics.	
Merkel Guide Ring Guivex SBK 	Hard fabric	10766	Patented geometry for an even distribution of stress, reduced total friction and wear, space-saving and cost-effective design possible.	

● = very good; ◐ = good; ○ = possible or satisfactory; ⊗ = not suitable

	Function					Operating Limits		
	single-acting	double-acting	Individual seal	Primary seal	Secondary seal	Pressure (MPa)	Speed (m/s)	Temperature (°C)
					<50 N/mm ² at 60 °C		1	-40 ... +120
					<50 N/mm ² at 60 °C		1	-40 ... +120
					<15 N/mm ² at 20 °C		5	-40 ... +200
					<15 N/mm ² at 20 °C		5	-40 ... +200
					<60 N/mm ² at 120 °C		1	-40 ... +120

Seal		Standard		
Type	Material	DIN/ISO	Examples of use	
Merkel Guide Ring Guivex KBK 	Hard fabric	10766	Patented geometry for an even distribution of stress, reduced total friction and wear, space-saving and cost-effective design possible.	
Merkel Guide Ring FRI 	Polyamide	10766	For loads up to 40 N/mm².	
Merkel Guide Ring FRA 	Polyamide	10766	For loads up to 40 N/mm².	

● = very good; ◐ = good; ○ = possible or satisfactory; ⊗ = not suitable

	Function					Operating Limits		
	single-acting	double-acting	Individual seal	Primary seal	Secondary seal	Pressure (MPa)	Speed (m/s)	Temperature (°C)
					<60 N/mm ² at 120 °C		1	-40 ... +120
					<40 N/mm ² at 20 °C		1	-30 ... +100
					<40 N/mm ² at 20 °C		1	-30 ... +100

Merkel Guide Ring EKF

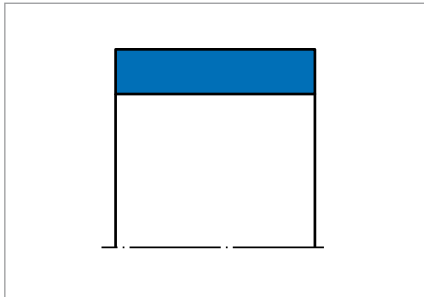


Fig. 1 Merkel Guide Ring EKF

Product description

Slit, non-metallic Merkel Guide Ring EKF.

Product advantages

Non-metallic guide element for pistons.

Application

Standard cylinders, mobile hydraulics, injection moulding machines.

Material

Material	Code
Polyamide	PA 4201

Operating conditions

Material	PA 4201
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +50
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +100
Running speed v in m/s	1
Loading (permitted specific surface pressure*)	≤25 N/mm ² at 20 °C ≤15 N/mm ² at 100 °C

* For the simple determination of the loading, a constant surface pressure is calculated using the projected area (D x H). The actual surface pressure is clearly greater in the centre of the surface than the calculated surface pressure. This is taken into account in the value for the permissible specific surface pressure.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤2 µm	≤10,0 µm
Groove flanks	≤3 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

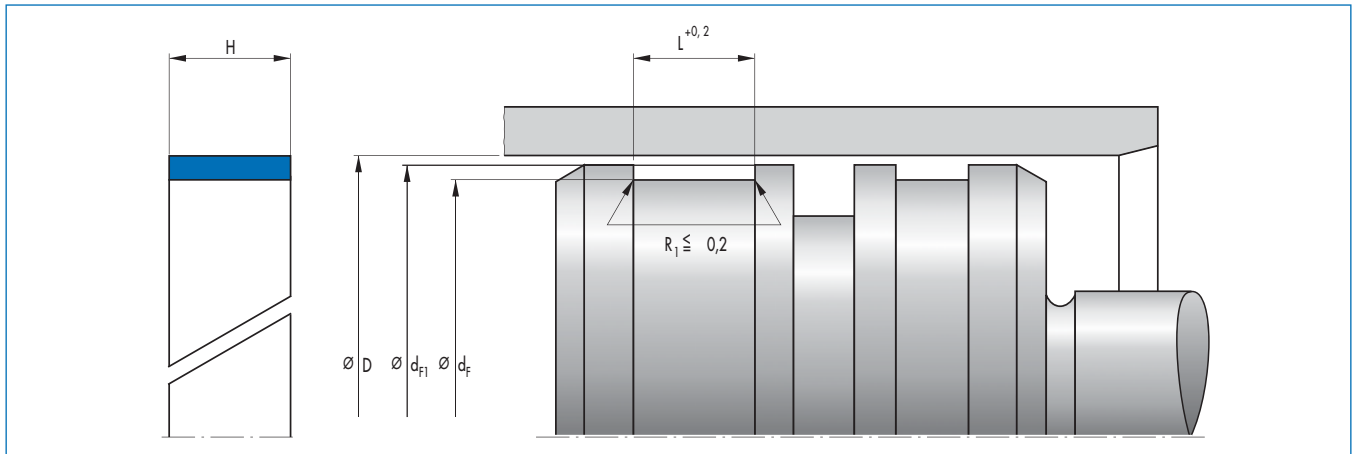
D_1	d_F	d_{F1}
H8	h8	h9

The tolerances given are recommended values. The usage of the guide and tolerance definition are to be considered in connection with the seal employed. The diameter d_{F1} given in the table of dimensions is to be considered exclusively in relation to the guide ring. The corresponding diameter for the adjacent seal housing is to be matched to the sealing component. → Technical Manual.

Fitting & installation

Merkel Guide Ring EKF can be easily snapped into the housing groove. Careful fitting is a prerequisite for correct function. → Technical Manual.

Article list



D	d _F	L	H	d _{F1}	Material	Article No.	
20	16	8,2	8	19,4	PA 4201	94215	●
25	21	8,2	8	24,4	PA 4201	99664	●
30	26	8,2	8	29,4	PA 4201	99665	●
32	28	8,2	8	31,4	PA 4201	94044	●
35	31	8,2	8	34,4	PA 4201	1264	●
40	36	8,2	8	39,4	PA 4201	99422	●
45	41	10,2	10	44,4	PA 4201	94191	●
50	46	10,2	10	49,4	PA 4201	99423	●
55	51	10,2	10	54,4	PA 4201	99424	●
58	54	10,2	10	57,4	PA 4201	95290	○
60	56	10,2	10	59,4	PA 4201	99375	●
63	59	10,2	10	62,4	PA 4201	99861	●
65	61	10,2	10	64,4	PA 4201	99368	●
70	66	10,2	10	69,4	PA 4201	99739	●
75	71	15,2	15	74,4	PA 4201	94192	●
80	76	15,2	15	79,4	PA 4201	34024	●
85	81	15,2	15	84,4	PA 4201	99331	○
90	86	15,2	15	89,4	PA 4201	99426	●
95	91	15,2	15	94,4	PA 4201	94193	○
100	96	15,2	15	99,4	PA 4201	99376	●
105	101	20,3	20	104,4	PA 4201	27257	○
110	106	20,3	20	109,4	PA 4201	99864	●
115	111	20,3	20	114,4	PA 4201	94194	○
120	116	20,3	20	119,4	PA 4201	99740	●
125	121	20,3	20	124,4	PA 4201	99172	●
130	126	20,3	20	129,4	PA 4201	99863	●
135	131	20,3	20	134,4	PA 4201	34301	○
140	136	20,3	20	139,4	PA 4201	99425	●
150	146	25,4	25	149,4	PA 4201	94201	●
160	156	25,4	25	159,4	PA 4201	99862	●
180	176	25,4	25	179,4	PA 4201	94204	●
200	196	25,4	25	199,4	PA 4201	99963	●
220	216	30,5	30	219,4	PA 4201	95594	○
250	246	30,5	30	249,4	PA 4201	94323	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Guide Ring FRA

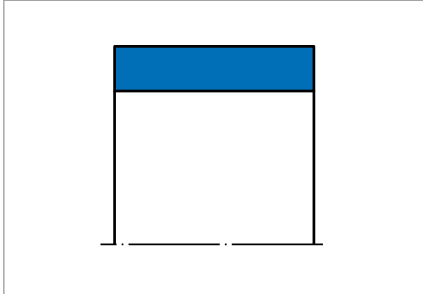


Fig. 1 Merkel Guide Ring FRA

Product description

Slit, non-metallic Merkel Guide Ring FRA.

Product advantages

As a non-metallic guide element for pistons, for standardised housings, amongst others, according to ISO 10766

- No seizure due to metal/plastic materials combination
- Medium load-bearing capacity
- Chamfered profile edges prevent pressing of edge into the corner radii of the housing groove
- Simple snap-in fitting.

Application

Earth moving equipment, industrial vehicles, agricultural machinery, cranes.

Material

Material	Code
Filled polyamide	PA 4112

Operating conditions

Material	PA 4112 (filled polyamide)
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +50
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +100
Running speed in m/s	1
Load (permitted specific surface pressure*)	≤40 N/mm ² at 20 °C ≤30 N/mm ² at 100 °C

* For the simple determination of the load, a constant surface pressure is calculated using the projected area (D x H). The actual surface pressure is clearly greater in the centre of the surface than the calculated surface pressure. This is taken into account in the value for the permissible specific surface pressure.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤2 µm	≤10,0 µm
Groove flanks	≤3 µm	≤15,0 µm

Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

D	d_F	d_{F1}
H8	h8	h9

The tolerances given are recommended values. The usage of the guide and tolerance definition are to be considered in relation to the seal employed. The diameter d_{F1} given in the table of dimensions is to be considered exclusively in connection with the guide ring. The corresponding diameter for the adjacent seal housing is to be matched to the sealing component.

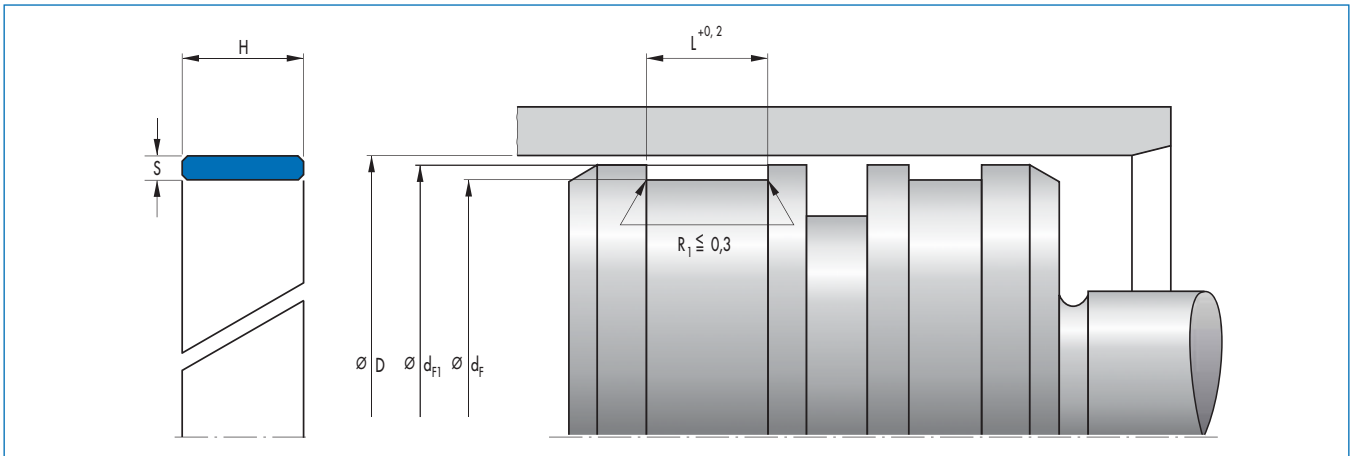
Manufacturing tolerance

D	Production tolerance profile thickness S
≤120	-0,1
>120	-0,15

Fitting & installation

Merkel Guide Ring FRA can be easily snapped into the housing groove. Careful fitting is a prerequisite for correct function. → Technical Manual.

Article list



D	d _F	L	H	d _{F1}	Material	Article No.	
20	16,9	4	3,9	19,4	PAGF Q04112	434212	●
25	21,9	4	3,9	24,4	PAGF Q04112	434213	●
30	26,9	4	3,9	29,4	PAGF Q04112	434214	○
32	28,9	4	3,9	31,4	PAGF Q04112	434215	●
35	31,9	4	3,9	34,4	PAGF Q04112	434217	●
40	35	5,6	5,4	39,4	PAGF Q04112	424740	●
45	40	5,6	5,4	44,4	PAGF Q04112	428783	●
50	45	5,6	5,4	49,4	PAGF Q04112	423806	●
55	50	9,7	9,5	54,4	PAGF Q04112	428789	●
60	55	9,7	9,5	59,4	PAGF Q04112	428800	●
63	58	9,7	9,5	62,4	PAGF Q04112	424703	●
65	60	9,7	9,5	64,4	PAGF Q04112	428802	●
70	65	9,7	9,5	69,4	PAGF Q04112	434199	●
75	70	9,7	9,5	74,4	PAGF Q04112	428814	●
80	75	9,7	9,5	79,4	PAGF Q04112	424702	●
90	85	9,7	9,5	89,4	PAGF Q04112	428815	●
100	95	9,7	9,5	99,4	PAGF Q04112	426223	●
110	105	9,7	9,5	109,4	PAGF Q04112	428819	●
120	115	9,7	9,5	119,4	PAGF Q04112	428820	●
125	120	9,7	9,5	124,4	PAGF Q04112	426238	●
140	135	15	14,8	139,4	PAGF Q04112	428858	●
160	155	15	14,8	159,4	PAGF Q04112	428860	●
180	175	15	14,8	179,4	PAGF Q04112	428863	●
200	195	15	14,8	199,4	PAGF Q04112	428866	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Guide Ring KB

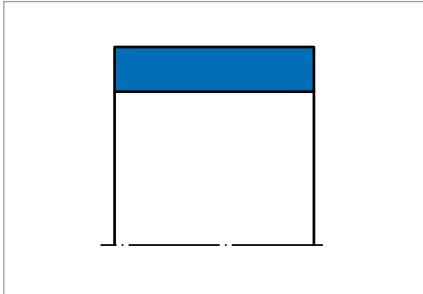


Fig. 1 Merkel Guide Ring KB

Product description

Non-metallic Merkel Guide Ring KB.

Product advantages

Non-metallic guide element for pistons, also for standardised housings according to ISO 10766

- Metal/fabric-base laminate materials combination prevents “seizing”
- High load-bearing capacity, elastic (not plastic) behaviour up to break point
- Chamfered profile edges prevent pressing of edge into the corner radii of the housing groove
- Simple snap-in fitting ($d \leq 300$).

Application

Earth moving equipment, agricultural machinery, injection moulding machines, loading platforms, support cylinders, industrial vehicles, cranes, presses, steel hydraulics engineering.

Material

Slotted Ring ≤ 300

Material	Code
Fabric-base laminate	HGW HG517

Ready to fit strip cut to size >300

Material	Code
Fabric-base laminate	HGW HG600

Operating conditions

Material	HGW HG517/HGW HG600
	Temperature range in °C
Hydraulic oils HL, HLP	-40 ... +120
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-40 ... +60
HFD fluids	-40 ... +120
Water	+5 ... +60
HETG (rapeseed oil)	-40 ... +80
HEES (synthetic ester)	-40 ... +100
HEPG (glycol)	-40 ... +80
Mineral greases	-40 ... +120

Surface quality

Surface roughness	R_a	R_{max}
Sliding surface	0,05 ... 0,3 μm	$\leq 2,5 \mu\text{m}$
Groove base	$\leq 2 \mu\text{m}$	$\leq 10,0 \mu\text{m}$
Groove flanks	$\leq 3 \mu\text{m}$	$\leq 15,0 \mu\text{m}$

Percentage contact area $M_v > 50\%$ up to max. 90% at cutting depth $c = Rz/2$ and reference line $C_{ref} = 0\%$.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

d_1
H8

The tolerance definition for the dimensions D and d_1 must be viewed in relation to the seal used. The diameter D_1 specified in the table of dimensions is to be viewed exclusively in connection with the guide ring. The corresponding diameter of an adjacent seal housing should match the sealing component.

Manufacturing tolerance

Profile thickness S
-0,02 ... -0,08

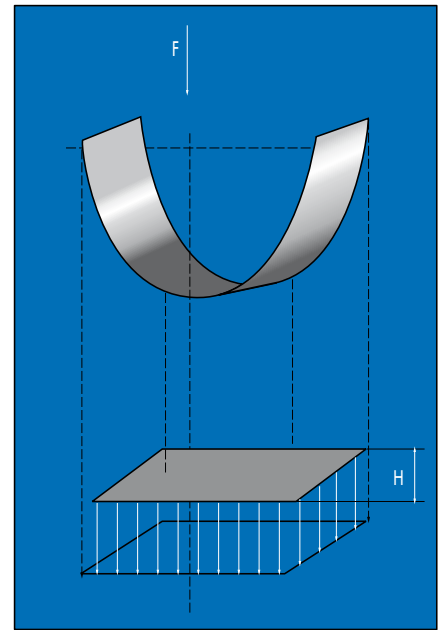
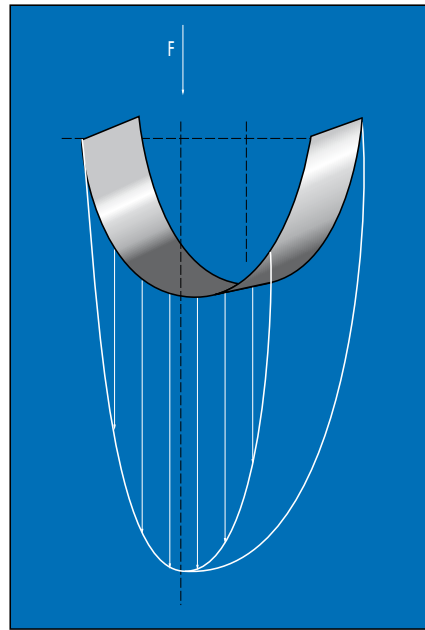
Surface load

Profile thickness S
p < 50 N/mm ² up to 60 °C
p < 25 N/mm ² up to 100 °C

For running speed, see sealing system.

Surface force

The pressure distribution on the guide rings is non-linear. The non-linear pressure curve over the contact range was taken into account when calculating the permissible specific surface pressure. The permissible load on the guide strip is calculated by multiplying the projected area with the permissible specific surface pressure. However, the figure for the permissible specific surface pressure takes into account the possible angular offset of the piston when using the recommended guide elements.



$$F = P \times A$$

$$H = F / (d \times P)$$

H = guide strip width [mm]

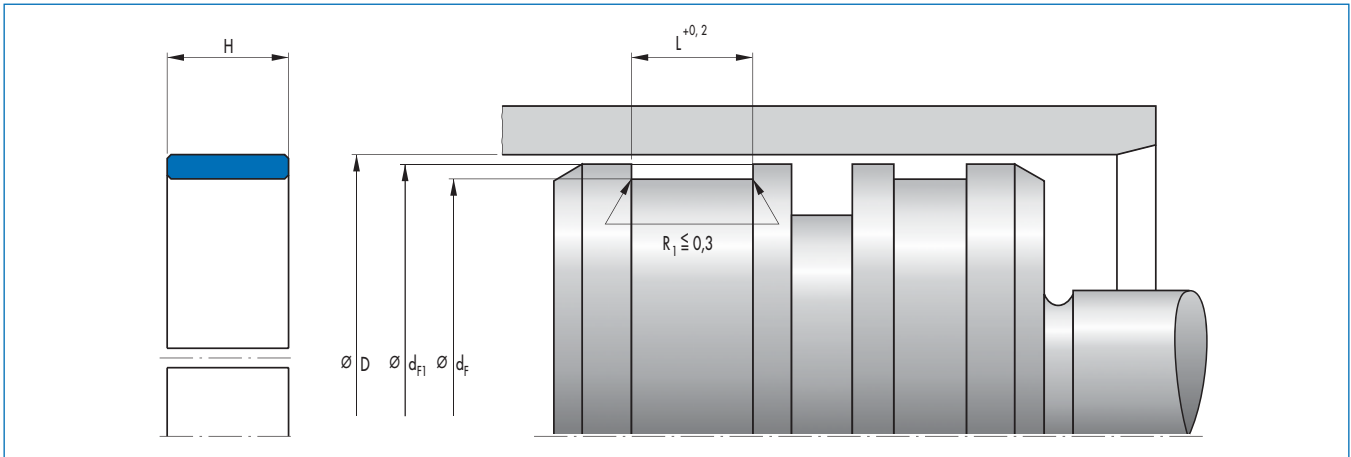
F = radial load [N]

A = projected area [mm²]

P = perm. compression per unit area [N/mm²]

d = rod diameter
with rod guidance;
piston diameter with
piston guidance [mm].

Article list

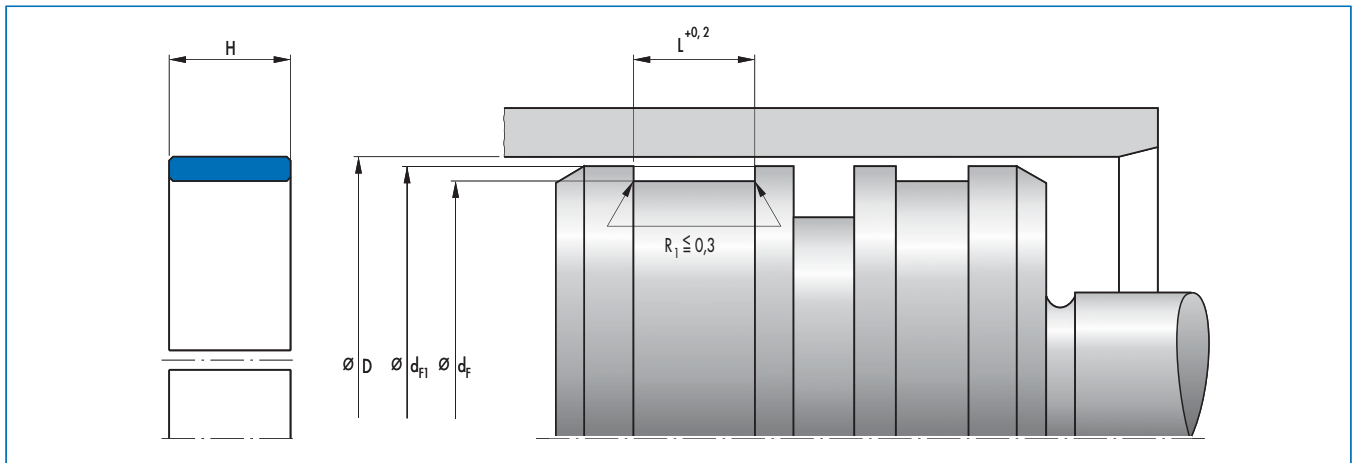


D	d _F	d ₁	L	H	Profile	Material	Article No.	
30	27	29	5,6	5,5	1,5	HGW HG517	24300231	●
32	29	31	5,6	5,5	1,5	HGW HG517	24300232	○
36	33	35	5,6	5,5	1,5	HGW HG517	24300234	○
40	35	38,4	5,6	5,5	2,5	HGW HG517	24130923	○
40	37	39	5,6	5,5	1,5	HGW HG517	24300235	○
42	37	40,4	5,6	5,5	2,5	HGW HG517	24130926	○
45	40	43,4	5,6	5,5	2,5	HGW HG517	24130929	○
50	45	48,4	5,6	5,5	2,5	HGW HG517	24130932	○
50	45	48,4	9,7	9,6	2,5	HGW HG517	24130933	●
55	50	53,4	5,6	5,5	2,5	HGW HG517	24130935	●
56	51	54,4	5,6	5,5	2,5	HGW HG517	24130938	○
60	55	58,4	5,6	5,5	2,5	HGW HG517	24130941	○
60	55	58,4	9,7	9,6	2,5	HGW HG517	24130942	○
60	55	58,4	10	9,9	2,5	HGW HG517	24375278	●
63	58	61,4	5,6	5,5	2,5	HGW HG517	24130944	●
63	58	61,4	9,7	9,6	2,5	HGW HG517	24130945	○
65	60	63,4	9,7	9,6	2,5	HGW HG517	24133632	●
70	62	67,5	25	24,5	4	HGW HG517	24298678	○
70	65	68,4	9,7	9,6	2,5	HGW HG517	24130948	○
70	65	68,4	15	14,8	2,5	HGW HG517	24345783	○
75	70	73,4	9,7	9,6	2,5	HGW HG517	24220353	●
80	75	78,4	9,7	9,6	2,5	HGW HG517	24130950	●
80	75	78,4	15	14,8	2,5	HGW HG517	24128202	●
85	80	83,4	9,7	9,6	2,5	HGW HG517	24135787	●
85	80	83,4	15	14,8	2,5	HGW HG517	24351574	○
90	85	88,4	9,7	9,6	2,5	HGW HG517	24130952	●
90	85	88,4	15	14,8	2,5	HGW HG517	24269687	○
95	90	93,4	9,7	9,6	2,5	HGW HG517	24300241	●
95	90	93,4	15	14,8	2,5	HGW HG517	24337625	○
100	95	98,4	9,7	9,6	2,5	HGW HG517	24130954	●
100	95	98,4	15	14,8	2,5	HGW HG517	24132237	●
105	100	103,4	9,7	9,6	2,5	HGW HG517	24209853	○
110	102	107,5	25	24,5	4	HGW HG517	24146909	○
110	105	108,4	9,7	9,6	2,5	HGW HG517	24130956	●
110	105	108,4	15	14,8	2,5	HGW HG517	24245043	●
115	110	113,4	15	14,8	2,5	HGW HG517	24245178	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d _F	d ₁	L	H	Profile	Material	Article No.	
120	112	117,5	25	24,5	4	HGW HG517	24302126	○
120	115	118,4	9,7	9,6	2,5	HGW HG517	24300246	○
120	115	118,4	15	14,8	2,5	HGW HG517	24144161	○
125	117	122,5	25	24,5	4	HGW HG517	24137311	○
125	120	123,4	9,7	9,6	2,5	HGW HG517	24130960	○
125	120	123,4	15	14,8	2,5	HGW HG517	24130961	○
125	120	123,4	25	24,5	2,5	HGW HG517	24174689	○
133,4	128,4	131,8	10	9,9	2,5	HGW HG517	24375988	○
140	132	137,5	20	19,8	4	HGW HG517	24335709	○
140	132	137,5	25	24,5	4	HGW HG517	24137312	●
140	135	138,4	9,7	9,6	2,5	HGW HG517	24130963	○
140	135	138,4	15	14,8	2,5	HGW HG517	24130964	●
140	135	138,4	20	19,8	2,5	HGW HG517	24349281	○
150	142	147,5	20	19,8	4	HGW HG517	24335710	○
150	142	147,5	25	24,5	4	HGW HG517	24146908	○
150	145	148,4	9,7	9,6	2,5	HGW HG517	24130966	○
150	145	148,4	15	14,8	2,5	HGW HG517	24130967	○
150	145	148,4	20	19,8	2,5	HGW HG517	24342275	●
150	145	148,4	25	24,5	2,5	HGW HG517	24245817	○
160	152	157,5	25	24,5	4	HGW HG517	24176821	○
160	155	158,4	9,7	9,6	2,5	HGW HG517	24130969	○
160	155	158,4	15	14,8	2,5	HGW HG517	24130970	●
160	155	158,4	20	19,8	2,5	HGW HG517	24351443	○
160	155	158,4	25	24,5	2,5	HGW HG517	24263520	○
170	165	168,4	15	14,8	2,5	HGW HG517	24130973	○
180	172	177,5	20	19,8	4	HGW HG517	24140088	○
180	172	177,5	25	24,5	4	HGW HG517	24290191	○
180	175	178,4	9,7	9,6	2,5	HGW HG517	24130975	○
180	175	178,4	15	14,8	2,5	HGW HG517	24130976	●
200	192	197,5	25	24,5	4	HGW HG517	24290195	○
200	195	198,4	9,7	9,6	2,5	HGW HG517	24130981	●
200	195	198,4	15	14,8	2,5	HGW HG517	24130982	●
200	195	198,4	20	19,8	2,5	HGW HG517	24350641	●
200	195	198,4	25	24,5	2,5	HGW HG517	24344891	○
210	205	208,4	15	14,8	2,5	HGW HG517	24334874	○
220	215	218,4	15	14,8	2,5	HGW HG517	24300249	●
220	215	218,4	25	24,5	2,5	HGW HG517	24143328	○
225	217	222,5	15	14,8	4	HGW HG517	24339297	○
225	217	222,5	25	24,5	4	HGW HG517	24330488	○
225	220	223,4	15	14,8	2,5	HGW HG517	24212963	○
225	220	223,4	25	24,5	2,5	HGW HG517	24142350	○
230	222	227,5	15	14,8	4	HGW HG517	24349607	○
230	225	228,4	15	14,8	2,5	HGW HG517	24334044	○
240	235	238,4	15	14,8	2,5	HGW HG517	24147696	○
240	235	238,4	20	19,8	2,5	HGW HG517	24342277	○
240	235	238,4	25	24,5	2,5	HGW HG517	24349511	○
250	242	247,5	25	24,5	4	HGW HG517	24299851	○
250	245	248,4	15	14,8	2,5	HGW HG517	24130988	○
250	245	248,4	25	24,5	2,5	HGW HG517	24144514	○
260	252	257,5	25	24,5	4	HGW HG517	24299314	○

● Available from stock ○ On request: Tool is available, delivery at short notice

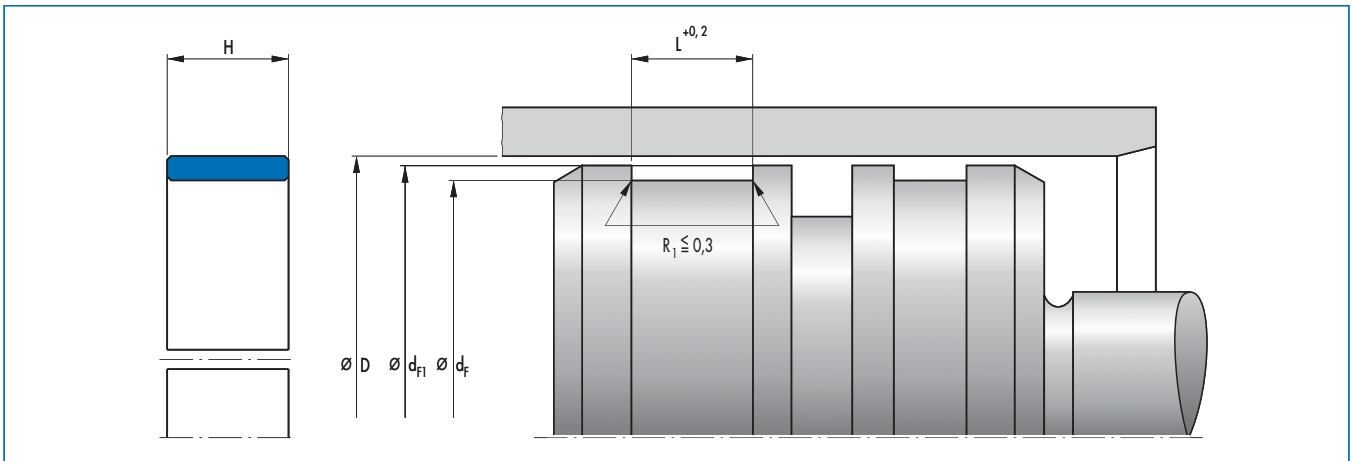


D	d _F	d ₁	L	H	Profile	Material	Article No.	
260	255	258,4	15	14,8	2,5	HGW HG517	24131488	○
280	275	278,4	15	14,8	2,5	HGW HG517	24130991	●
280	275	278,4	25	24,5	2,5	HGW HG517	24350273	○
300	295	298,4	15	14,8	2,5	HGW HG517	24137782	●
305	300	303,4	15	14,8	2,5	HGW HG600	24142162	○
310	305	308,4	25	24,5	2,5	HGW HG600	24353021	○
315	310	313,4	15	14,8	2,5	HGW HG600	24351270	○
320	315	318,4	15	14,8	2,5	HGW HG600	24130993	○
320	315	318,4	25	24,5	2,5	HGW HG600	24130994	○
330	325	328,4	15	14,5	2,5	HGW HG600	24311172	○
330	325	328,4	25	24,5	2,5	HGW HG600	24260227	○
340	335	338,4	15	14,8	2,5	HGW HG600	24300250	○
340	335	338,4	25	24,5	2,5	HGW HG600	24300251	○
350	342	347,5	25	24,5	4	HGW HG600	24300936	○
350	345	348,4	15	14,8	2,5	HGW HG600	24338667	○
350	345	348,4	25	24,5	2,5	HGW HG600	24330500	○
355	350	353,4	25	24,5	2,5	HGW HG600	24215447	○
360	352	357,5	25	24,5	4	HGW HG600	24331493	○
360	355	358,4	15	14,8	2,5	HGW HG600	24130996	○
360	355	358,4	25	24,5	2,5	HGW HG600	24130997	○
380	372	377,5	25	24,5	4	HGW HG600	24294294	○
380	375	378,4	15	14,8	2,5	HGW HG600	24333136	○
380	375	378,4	25	24,5	2,5	HGW HG600	24352259	○
390	382	387,5	25	24,5	4	HGW HG600	24344183	○
390	385	388,4	15	14,8	2,5	HGW HG600	24338260	○
390	385	388,4	25	24,5	2,5	HGW HG600	24256744	○
400	392	397,5	25	24,5	4	HGW HG600	24307328	○
400	395	398,4	15	14,8	2,5	HGW HG600	24300252	○
400	395	398,4	25	24,5	2,5	HGW HG600	24300253	○
410	402	407,5	25	24,5	4	HGW HG600	24263733	○
410	405	408,4	15	14,8	2,5	HGW HG600	24375939	○
420	415	418,4	15	14,8	2,5	HGW HG600	24259239	○
420	415	418,4	25	24,5	2,5	HGW HG600	24261300	○
430	425	428,4	15	14,8	2,5	HGW HG600	24296973	○
430	425	428,4	25	24,5	2,5	HGW HG600	24339689	○
440	432	437,5	25	24,5	4	HGW HG600	24289887	○
440	435	438,4	15	14,8	2,5	HGW HG600	24338261	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d _F	d ₁	L	H	Profile	Material	Article No.	
440	435	438,4	25	24,5	2,5	HGW HG600	24368282	○
450	442	447,5	25	24,5	4	HGW HG600	24259181	○
450	445	448,4	15	14,5	2,5	HGW HG600	24345674	○
450	445	448,4	25	24,5	2,5	HGW HG600	24250199	○
460	455	458,4	15	14,8	2,5	HGW HG600	24341856	○
460	455	458,4	20	19,5	2,5	HGW HG600	24341855	○
460	455	458,4	25	24,5	2,5	HGW HG600	24339270	○
470	465	468,4	25	24,5	2,5	HGW HG600	24294215	○
480	472	477,5	25	24,5	4	HGW HG600	24331494	○
480	475	478,4	25	24,5	2,5	HGW HG600	24250198	○
490	482	487,5	25	24,5	4	HGW HG600	24262693	○
500	492	497,5	25	24,5	4	HGW HG600	24294986	○
500	495	498,4	25	24,5	2,5	HGW HG600	24302073	○
508	500	505,5	25	24,5	4	HGW HG600	24360120	○
510	505	508,4	25	24,5	2,5	HGW HG600	24359433	○
520	515	518,4	15	14,8	2,5	HGW HG600	24274934	○
530	522	527,5	25	24,5	4	HGW HG600	24290173	○
530	525	528,4	15	14,8	2,5	HGW HG600	24294259	○
540	532	537,5	25	24,5	4	HGW HG600	24299558	○
540	535	538,4	15	14,8	2,5	HGW HG600	24359735	○
540	535	538,4	25	24,5	2,5	HGW HG600	24359576	○
550	545	548,4	25	24,5	2,5	HGW HG600	24302134	○
560	552	557,5	25	24,5	4	HGW HG600	24332680	○
560	555	558,4	15	14,8	2,5	HGW HG600	24185838	○
560	555	558,4	25	24,5	2,5	HGW HG600	24336491	○
570	565	568,4	25	24,5	2,5	HGW HG600	24351059	○
575	570	573,4	25	24,5	2,5	HGW HG600	24289831	○
580	572	577,5	25	24,5	4	HGW HG600	24298400	○
580	575	578,4	25	24,5	2,5	HGW HG600	24345487	○
600	592	597,5	25	24,5	4	HGW HG600	24275141	○
600	595	598,4	15	14,8	2,5	HGW HG600	24274937	○
600	595	598,4	25	24,5	2,5	HGW HG600	24362837	○
610	602	607,5	25	24,5	4	HGW HG600	24344890	○
620	612	617,5	25	24,5	4	HGW HG600	24291804	○
620	615	618,4	25	24,5	2,5	HGW HG600	24309946	○
625	620	623,4	9,7	9,6	2,5	HGW HG600	24351384	○
630	622	627,5	25	24,5	4	HGW HG600	24340041	○
640	632	637,5	25	24,5	4	HGW HG600	24275165	○
650	642	647,5	25	24,5	4	HGW HG600	24358966	○
660	652	657,5	25	24,5	4	HGW HG600	24315102	○
680	672	677,5	25	24,5	4	HGW HG600	24298436	○
680	675	678,5	25	24,5	2,5	HGW HG600	24344258	○
700	692	697,5	25	24,5	4	HGW HG600	24314495	○
700	695	698,4	15	14,8	2,5	HGW HG600	24275184	○
710	702	707,5	25	24,5	4	HGW HG600	24340042	○
710	705	708,4	15	14,8	2,5	HGW HG600	24287808	○
720	715	718,4	15	14,8	2,5	HGW HG600	24302590	○
720	715	718,4	25	24,5	2,5	HGW HG600	24250197	○
730	722	727,5	25	24,5	4	HGW HG600	24269481	○
740	732	737,5	25	24,5	4	HGW HG600	24263271	○

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d _F	d ₁	L	H	Profile	Material	Article No.	
750	742	747,5	25	24,5	4	HGW HG600	24293965	○
770	765	768,4	25	24,5	2,5	HGW HG600	24344259	○
780	775	778,4	15	14,8	2,5	HGW HG600	24358669	○
800	792	797,5	25	24,5	4	HGW HG600	24243178	○
800	795	798,4	15	14,8	2,5	HGW HG600	24257374	○
813,3	805,3	810,8	25	24,5	4	HGW HG600	24346654	○
820	812	817,5	25	24,5	4	HGW HG600	24341040	○
830	822	827,5	25	24,5	4	HGW HG600	24295835	○
850	842	847,5	25	24,5	4	HGW HG600	24293544	○
870	862	867,5	25	24,5	4	HGW HG600	24359019	○
878	870	875,5	25	24,5	4	HGW HG600	24358857	○
880	872	877,5	25	24,5	4	HGW HG600	24339269	○
900	892	897,5	25	24,5	4	HGW HG600	24344382	○
914,4	906,4	911,9	25	24,5	4	HGW HG600	24358613	○
965	957	962,5	25	24,5	4	HGW HG600	24263886	○
965,2	957,2	962,7	25	24,5	4	HGW HG600	24331519	○
1050	1042	1047,5	25	24,4	4	HGW HG600	24257239	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Guide Ring Guivex KBK

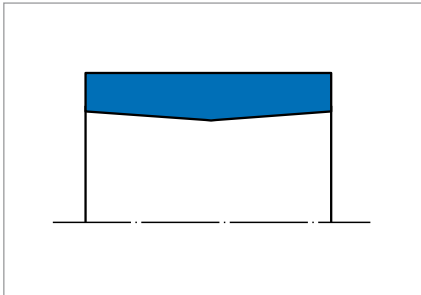


Fig. 1 Merkel Guide Ring Guivex KBK

Product description

Profiled Merkel Guide Ring Guivex KBK made from fabric-base laminate. Patented product design (patent-no.: PCT/EP95/03874).

Product advantages

Merkel KBK guide rings offer clear advantages over conventional guide strips/rings, designed for standardised housings according to ISO 10766 amongst others

- Interchangeable to existing operating environments of the types SB and SF
- High radial load
- Very good utilisation of the guide length through even distribution of stress
- Improved drawing-in of lubricating medium through optimised distribution of stress in the contact zone between guide bush and counter-acting surface
- Reduced stick-slip tendency
- Outstanding running behaviour with short guide distances (no clamping).

Application

Long stroke cylinders (piston rod bowing under load), short guide distances (lateral buckling of the piston rod), short stroke (inadequate lubrication) friction-optimised sealing systems, additional item for metal guides, mobile hydraulics, heavy-duty hydraulics.

Material

Ø range ≤300

Material	Code	Colour
Fabric-base laminate	HGW HG517	Dark grey
Fabric-base laminate	HGW HG650	Red

Ø range >300

Material	Code	Colour
Fabric-base laminate	HGW HG650	Red

Operating conditions

Material	HGW HG517/HGW HG650
Temperature range in °C	
Hydraulic oils HL, HLP	-40 ... +120
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-40 ... +60
HFD fluids	-40 ... +120
Water	+5 ... +60
HETG (rapeseed oil)	-40 ... +80
HEES (synthetic esters)	-40 ... +100
HEPG (glycol)	-40 ... +80
Mineral greases	-40 ... +120

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

The long-term behaviour of the sealing component as well as the security against early failures are primarily determined by the quality of the counter-acting surface. This means that the surface must be precisely described and evaluated. Based on current knowledge we recommend supplementing the above definition of the surface quality of the

sliding surface with the quantities in the following table. The previous general description of the material component is significantly improved with the new quantities from the material component, particularly with reference to the abrasiveness of the surface.

→ Technical Manual.

Design notes

The diameter D_1 given in the table of dimensions is to be considered exclusively in relation to the guide ring. The corresponding diameter for the adjacent seal housing is to be matched to the sealing component.

Sliding surfaces

Characteristic value	Limit position
R_a	>0,05 mm ... 0,30 mm
R_{max}	<2,50 mm
R_{pkx}	<0,50 mm
R_{pk}	<0,50 mm
R_k	>0,25 mm ... 0,70 mm
R_{vk}	>0,20 mm ... 0,65 mm
R_{vkk}	>0,20 mm ... 2,00 mm

The limit values listed in the table are not currently applicable for ceramic or partial ceramic counter-surfaces.

Tolerance

Production tolerance profile thickness S
-0,01 ... -0,06

Surface load

The value for the specific compression per unit area is dependent on the operating temperature and the size of the elastic deformation (deflection) of the guide element. The maximum possible deflection is limited in a sealing system by the smallest gap dimension behind the primary seal. → Technical Manual.

Deflection

- $e1 = 0,10$ for $s = 2,5$
- $e1 = 0,15$ for $s = 4,0$
- $e2 = 0,15$ for $s = 2,5$
- $e2 = 0,20$ for $s = 4,0$

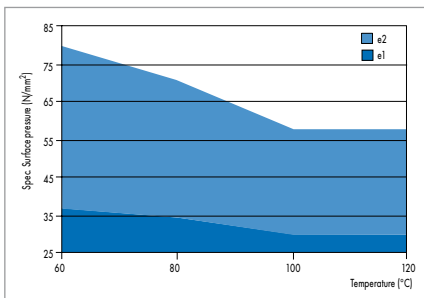
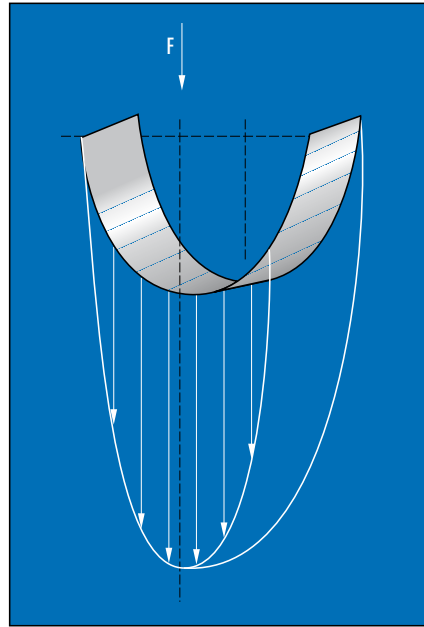


Fig. 2 Special surface pressure for parallel load

Radial load

The pressure distribution on the guide rings is non-linear. The non-linear pressure curve over the contact range was taken into account when calculating the permissible specific surface pressure. The required guide width can be calculated

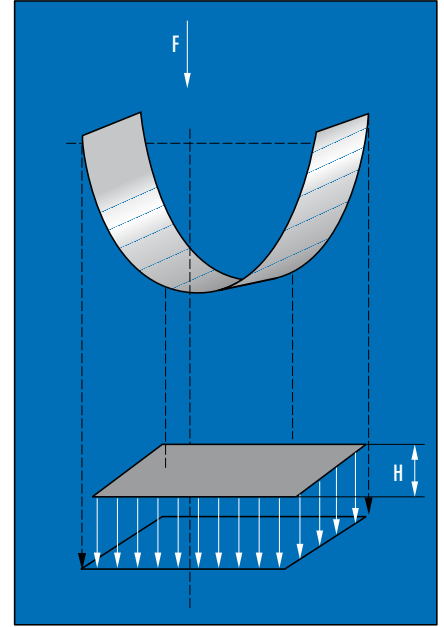


$$F = P \times A$$

$$H = F / (d \times P)$$

H = guide strip width [mm]
 F = radial load [N]
 A = projected area [mm²]

using the following formulas. Taking the increased service life into consideration, a reduction of the load by selection of a wide guide can make sense in individual cases.



P = perm. compression per unit area [N/mm²]
 d = rod diameter with rod guidance; piston diameter with piston guidance [mm].

Mode of operation

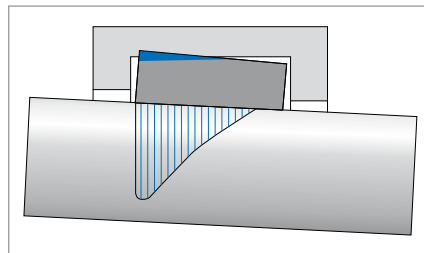


Fig. 3 Rectangular guide ring: stress peaks in the edge area

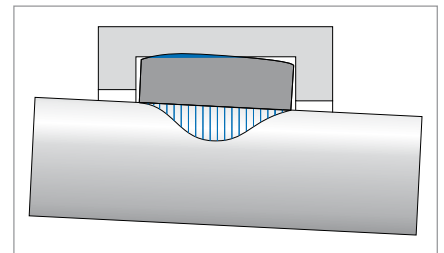
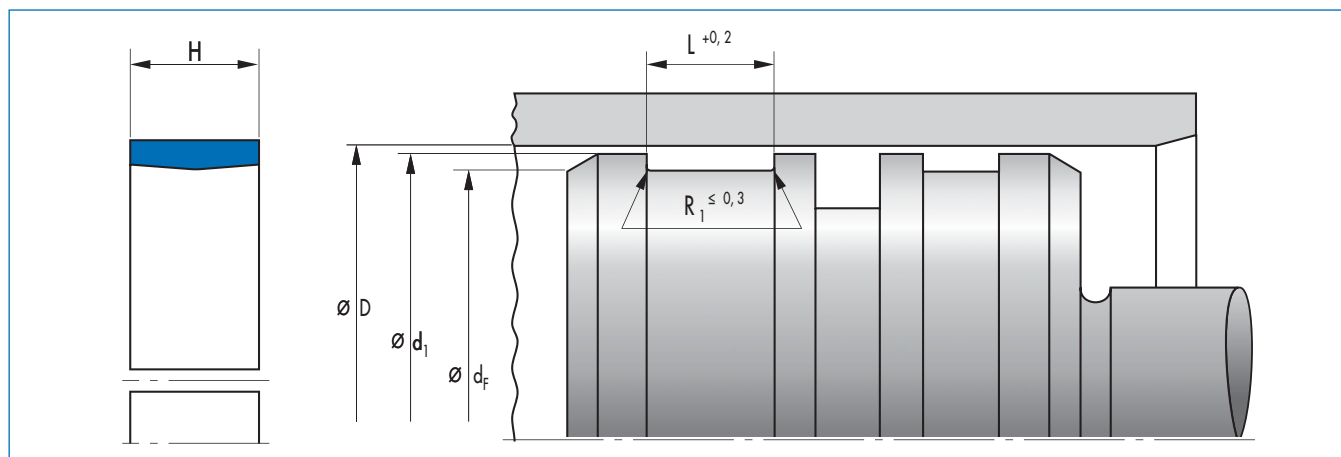


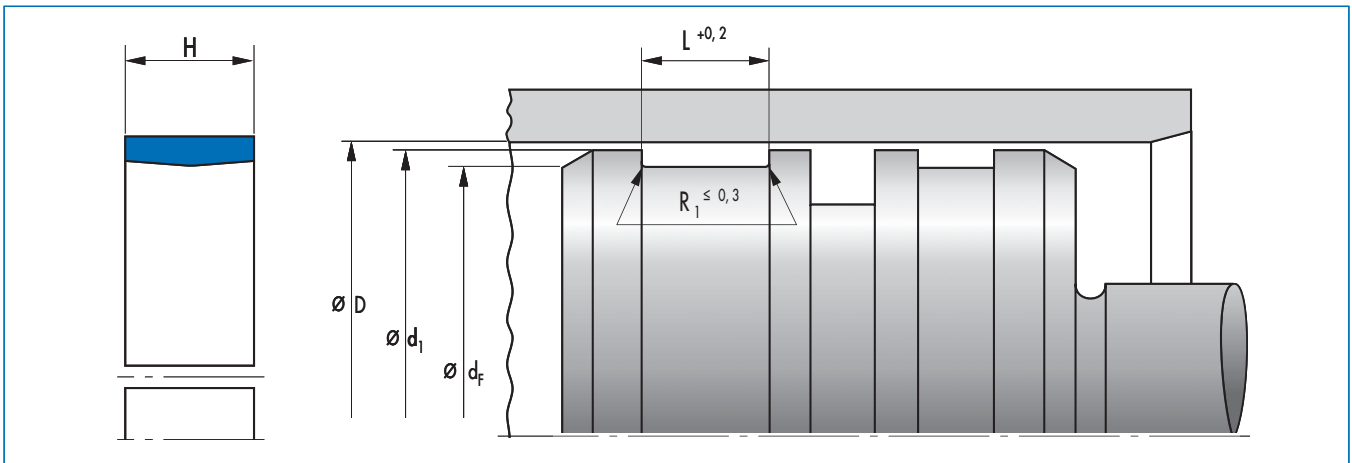
Fig. 4 Merkel Guide Ring Guivex KBK: even distribution of stress

Article list



D	d _F	d ₁	L	H	Profile	Material	Article No.	
40	35	38,4	25	14,8	2,5	HGW HG517	24373629	○
50	45	48,4	9,7	9,5	2,5	HGW HG517	24376320	●
60	55	58,4	9,7	9,5	2,5	HGW HG517	24381008	○
63	58	61,4	9,7	9,5	2,5	HGW HG517	24377609	●
65	60	63,4	9,7	9,5	2,5	HGW HG517	24379281	○
70	65	68,4	9,7	9,5	2,5	HGW HG517	24378390	○
75	67	72,5	15	14,8	4	HGW HG517	49005284	○
75	70	73,4	9,7	9,5	2,5	HGW HG517	24379280	○
80	75	78,4	9,7	9,5	2,5	HGW HG517	24378388	●
85	80	83,4	9,7	9,5	2,5	HGW HG517	24380508	○
90	85	88,4	9,7	9,5	2,5	HGW HG517	49000753	○
95	90	93,4	9,7	9,5	2,5	HGW HG517	24378389	○
95	90	93,4	15	14,8	2,5	HGW HG517	24380164	○
98	93	96,4	9,7	9,5	2,5	HGW HG517	528477	○
100	92	97,5	20	19,8	4	HGW HG517	49005017	○
100	95	98,4	9,7	9,5	2,5	HGW HG517	49002078	○
100	95	98,4	15	14,8	2,5	HGW HG517	24375947	●
100	95	98,4	20	19,8	2,5	HGW HG517	24373283	○
105	100	103,4	9,7	9,5	2,5	HGW HG517	24367544	○
110	102	107,5	20	19,8	4	HGW HG517	24359047	○
110	102	107,5	25	24,5	4	HGW HG517	49004871	○
110	105	108,4	20	19,8	2,5	HGW HG517	24380278	○
115	110	113,4	15	14,8	2,5	HGW HG517	24378948	○
120	112	117,5	25	24,5	4	HGW HG517	49004872	○
120	115	118,4	15	14,8	2,5	HGW HG517	49000752	○
120	115	118,4	20	19,8	2,5	HGW HG517	24380279	○
125	120	123,4	9,7	9,5	2,5	HGW HG517	49000675	○
125	120	123,4	15	14,8	2,5	HGW HG517	24375948	●
130	122	127,5	25	24,5	4	HGW HG517	24358243	○
130	124	128	20	19,8	3	HGW HG517	49002431	○
130	125	128,4	9,7	9,5	2,5	HGW HG517	49002077	○
130	125	128,4	20	19,8	2,5	HGW HG517	531549	○
130	125	128,4	25	24,5	2,5	HGW HG517	528114	○
140	135	138,4	15	14,8	2,5	HGW HG517	24380185	●
140	135	138,4	20	19,8	2,5	HGW HG517	24380281	○
140	135	138,4	25	24,5	2,5	HGW HG517	528117	○

● Available from stock ○ On request: Tool is available, delivery at short notice

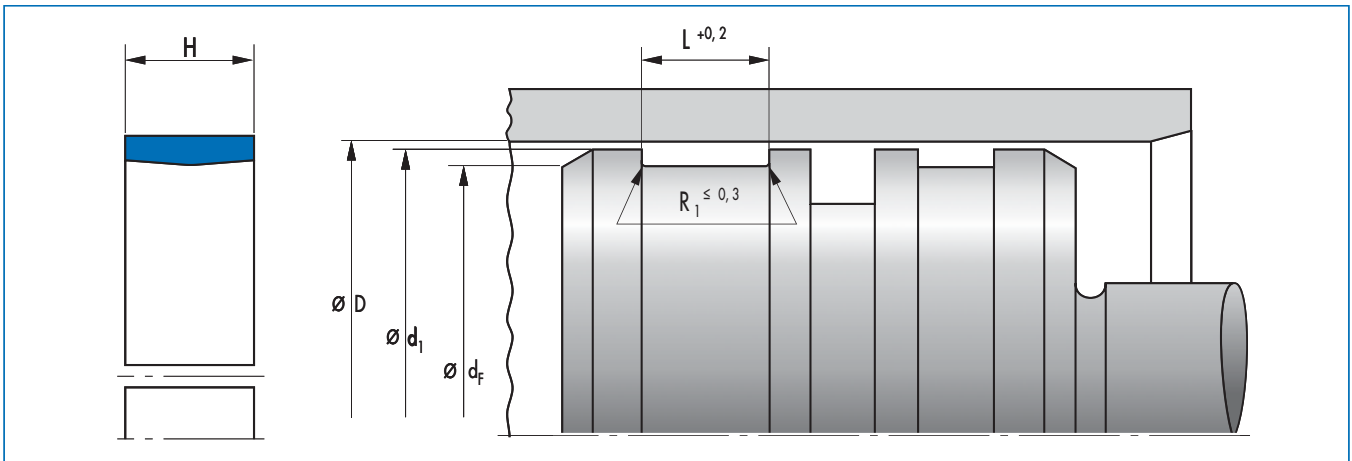


D	d _F	d ₁	L	H	Profile	Material	Article No.	
149	144	147,4	15	14,8	2,5	HGW HG517	24380165	○
150	145	148,4	9,7	9,5	2,5	HGW HG517	49001347	○
150	145	148,4	25	24,5	2,5	HGW HG517	529384	○
160	155	158,4	15	14,8	2,5	HGW HG517	24378946	●
160	155	158,4	20	19,8	2,5	HGW HG517	526097	○
160	155	158,4	25	24,5	2,5	HGW HG517	24380280	○
160	155	158,4	35	34,5	2,5	HGW HG517	24379367	○
170	162	167,5	25	24,5	4	HGW HG517	49003985	○
170	165	168,4	25	24,5	2,5	HGW HG517	526071	○
180	172	177,5	25	24,5	4	HGW HG517	24380555	○
180	175	178,4	9,7	9,5	2,5	HGW HG517	49001427	○
180	175	178,4	15	14,8	2,5	HGW HG517	24378947	●
180	175	178,4	35	34,5	2,5	HGW HG517	24377817	○
190	185	188,4	15	14,8	2,5	HGW HG517	49003727	○
190	185	188,4	25	24,5	2,5	HGW HG517	24379077	○
200	192	197,5	35	34,5	4	HGW HG517	24380583	○
200	195	198,4	15	14,8	2,5	HGW HG517	49003728	○
200	195	198,4	20	19,8	2,5	HGW HG517	24380282	○
200	195	198,4	30	29,5	2,5	HGW HG517	24380416	○
200	195	198,4	35	34,5	2,5	HGW HG517	24380417	○
210	205	208,4	15	14,8	2,5	HGW HG517	49002879	○
210	205	208,4	35	34,5	2,5	HGW HG517	49001642	○
215	210	213,4	15	14,8	2,5	HGW HG517	24380699	●
220	215	218,4	15	14,8	2,5	HGW HG517	49018312	○
220	215	218,4	25	24,5	2,5	HGW HG517	49001458	○
220	215	218,4	25	34,5	2,5	HGW HG517	24379368	○
223,5	215,5	220,5	40	39,5	4	HGW HG517	49046270	○
225	217	222,5	40	39,5	4	HGW HG517	530604	○
225	220	223,4	25	24,5	2,5	HGW HG517	24380539	○
230	225	228,4	9,7	9,5	2,5	HGW HG517	24380706	○
230	225	228,4	15	14,8	2,5	HGW HG517	24372436	●
230	225	228,4	20	19,8	2,5	HGW HG517	24378298	○
230	225	228,4	35	34,5	2,5	HGW HG517	24378002	○
240	235	238,4	15	14,8	2,5	HGW HG517	24380340	○
240	235	238,4	25	24,5	2,5	HGW HG517	24379078	○
250	242	247,5	40	39,5	4	HGW HG517	24378050	○
250	245	248,4	15	14,8	2,5	HGW HG517	24378945	●

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d _F	d ₁	L	H	Profile	Material	Article No.	
250	245	248,4	25	24,5	2,5	HGW HG517	49002401	○
260	252	257,5	40	39,5	4	HGW HG517	24378051	○
260	255	258,4	25	24,5	2,5	HGW HG517	49002880	○
260	255	258,4	35	34,5	2,5	HGW HG517	529482	○
268	263	266,4	15	14,8	2,5	HGW HG517	24380700	●
270	265	268,4	25	24,5	2,5	HGW HG517	24379079	○
270	265	268,4	35	34,5	2,5	HGW HG517	49000025	○
280	272	277,5	40	39,5	4	HGW HG517	24378052	○
280	275	278,4	25	24,5	2,5	HGW HG517	527111	○
290	282	287,5	40	39,5	4	HGW HG517	528969	○
300	295	298,4	25	24,5	2,5	HGW HG600	24378787	●
300	295	298,4	35	34,5	2,5	HGW HG517	529484	○
310	302	307,5	40	39,6	4	HGW HG600	24378053	○
310	305	308,4	15	14,8	2,5	HGW HG600	24380701	●
320	312	317,5	25	24,5	4	HGW HG600	24379044	●
320	312	317,5	40	39,6	4	HGW HG600	24378054	○
330	322	327,5	30	29,5	4	HGW HG600	49004578	○
330	325	328,4	25	24,5	2,5	HGW HG600	24379256	●
340	332	337,5	25	24,5	4	HGW HG600	24379045	○
340	332	337,5	30	29,5	4	HGW HG600	528485	○
350	342	347,5	25	24,5	4	HGW HG600	530277	○
350	342	347,5	40	39,5	4	HGW HG600	533359	○
360	352	357,5	25	24,5	4	HGW HG600	531639	○
360	352	357,5	30	29,5	4	HGW HG600	24379154	●
360	352	357,5	40	39,5	4	HGW HG600	24378056	●
375	367	372,5	25	24,5	4	HGW HG600	24379080	○
375	370	373,4	25	24,5	2,5	HGW HG600	24378788	●
380	372	377,5	40	39,5	4	HGW HG600	24378057	○
400	392	397,5	40	39,5	4	HGW HG600	24378058	○
410	402	407,5	40	39,5	4	HGW HG600	531871	○
420	412	417,5	25	24,5	4	HGW HG600	24379046	○
420	412	417,5	40	39,5	4	HGW HG600	24378059	○
430	422	427,5	40	39,5	4	HGW HG600	49003308	○
440	432	437,5	25	24,5	4	HGW HG600	49002762	○
441	433	438,5	40	39,5	4	HGW HG600	532899	○
460	452	457,5	25	24,5	4	HGW HG600	24379348	●
460	452	457,5	40	39,5	4	HGW HG600	24379244	●
480	472	477,5	25	24,5	4	HGW HG600	24379081	○
480	472	477,5	40	39,5	4	HGW HG600	24378060	○
480	475	478,4	25	24,5	2,5	HGW HG600	24378805	●
500	492	497,5	25	24,5	4	HGW HG600	49002908	○
500	492	497,5	40	39,5	4	HGW HG600	531874	○
530	522	527,5	25	24,5	4	HGW HG600	530276	○
540	532	537,5	25	24,5	4	HGW HG600	24379047	○
540	535	538,4	25	24,5	2,5	HGW HG600	24378806	○
560	552	557,5	25	24,5	4	HGW HG600	24377622	○
580	572	577,5	25	24,5	4	HGW HG600	24379048	○
600	592	597,5	25	24,5	4	HGW HG600	24377999	○
600	592	597,5	40	39,5	4	HGW HG600	24379323	○
600	595	598,4	25	24,5	2,5	HGW HG600	24378808	○

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d _F	d ₁	L	H	Profile	Material	Article No.	
620	612	617,5	25	24,5	4	HGW HG600	49004662	○
630	622	627,5	25	24,5	4	HGW HG600	24379049	○
630	622	627,5	40	39,5	4	HGW HG600	49002675	○
640	632	637,5	25	24,5	4	HGW HG600	531869	○
680	672	677,5	25	24,5	4	HGW HG600	527133	○
680	672	677,5	40	39,5	4	HGW HG600	49004923	○
680	675	678,4	25	24,5	2,5	HGW HG600	526191	●
700	692	697,5	25	24,5	4	HGW HG600	24376187	○
700	692	697,5	35	34,5	4	HGW HG600	49003965	○
710	702	707,5	40	39,5	4	HGW HG600	49002676	○
740	732	737,5	35	34,5	4	HGW HG600	24378498	○
760	752	757,5	40	39,5	4	HGW HG600	24379321	○
800	792	797,5	20	19,8	4	HGW HG600	49000238	○
800	792	797,5	25	24,5	4	HGW HG600	24378000	○
850	842	847,5	25	24,5	4	HGW HG600	531637	○
865	857	862,5	20	19,8	4	HGW HG600	531678	○
865	857	862,5	40	39,5	4	HGW HG600	49003031	○
950	942	947,5	25	24,5	4	HGW HG600	24379050	●
952	942	948,5	25	24,5	5	HGW HG600	532858	○
965	957	962,5	25	24,5	4	HGW HG600	49003044	○
1050	1042	1047,5	25	24,5	4	HGW HG600	24376188	○
1160	1152	1157,5	40	39,5	4	HGW HG600	49002142	○
1200	1192	1197,5	25	24,5	4	HGW HG600	533290	○
1250	1242	1247,5	25	24,5	4	HGW HG600	530020	●
1450	1442	1447,5	40	39,5	4	HGW HG600	531903	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Guide Strip KF

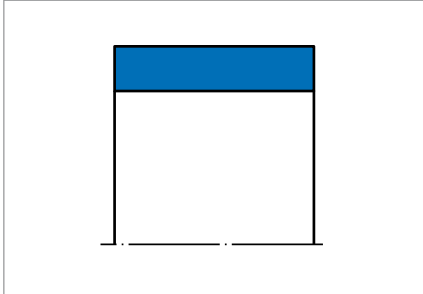


Fig. 1 Merkel Guide Strip KF

Product description

Non-metallic Merkel Guide Strip KF, available ready to fit cut to size or by the metre.

Product advantages

Non-metallic guide element for pistons, also for standardised housings as per ISO 10766

- Low friction, free of stick-slip.

Application

Injection moulding machines, control and regulation equipment, handling equipment.

Material

Material	Code
PTFE bronze compound	PTFE B500

Operating conditions

Material	PTFE B500
	Temperature range in °C
Hydraulic oils HL, HLP	-40 ... +200
HFA fluids	-
HFB fluids	-
HFC fluids	-
HFD fluids	-40 ... +200
Water	-
HETG (rapeseed oil)	-40 ... +80
HEES (synthetic esters)	-40 ... +100
HEPG (glycol)	-40 ... +80
Mineral greases	-40 ... +200

Surface quality

Surface roughness	R_a	R_{max}
Sliding surface	0,05 ... 0,3 μm	$\leq 2,5 \mu\text{m}$
Groove base	$\leq 2 \mu\text{m}$	$\leq 10,0 \mu\text{m}$
Groove flanks	$\leq 3 \mu\text{m}$	$\leq 15,0 \mu\text{m}$

Percentage contact area $M_v > 50\%$ to max. 90% at cutting depth $c = R_z/2$ and reference line $C_{ref} = 0\%$.

Design notes

Please observe our general design notes in → Technical Manual.

Calculating straight length L2

L2	Production tolerances
>20 ... 80	... 0,5
>80 ... 250	... 1,0
>250 ... 500	... 1,5
>500 ... 1000	... 2,0
>1000 ... 2000	... 3,0
>2000 ... 4000	... 4,0

Tolerance recommendation

d₁
h8

The tolerance definition for the dimensions D and d_F must be viewed in connection with the seal used. The diameter D₁ specified in the table of dimensions is to be viewed exclusively in relation to the guide ring. The corresponding diameter of an adjoining seal housing should be tailored to the sealing component.

Manufacturing tolerance

Production tolerance profile thickness S
-0,05

Surface load

p < 15 N/mm ² up to 20 °C
p < 7,5 N/mm ² up to 80 °C
p < 5 N/mm ² up to 120 °C

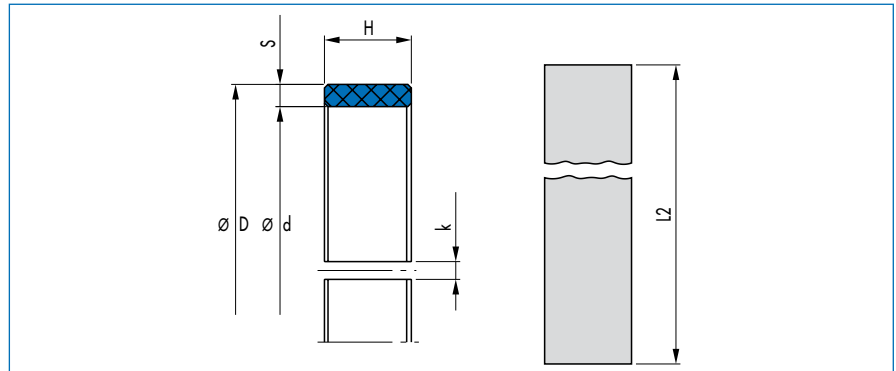
For running speed, see sealing system.

Cutting rolls to size

The following dimensions are available from stock by the metre. The straight length L₂ of blanks is to be determined using the formula. The gap k produced after fitting is necessary due to thermal expansion. We recommend a straight cut on the strips. On impact at an angle the tips may be damaged and break-off. Our cutter (Article No. 507228) facilitates time-saving and accurate cutting to size.

Calculating stretched length L₂ for rods:

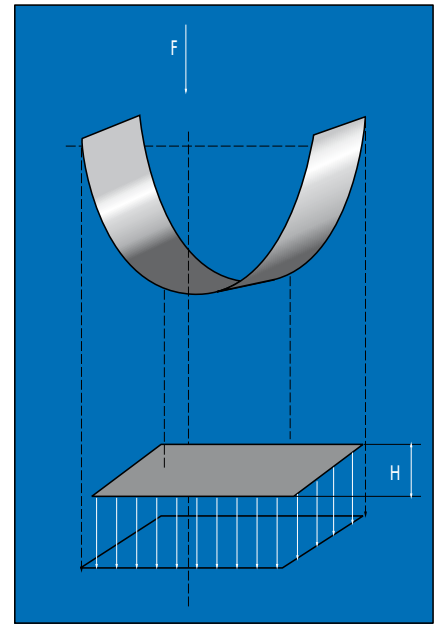
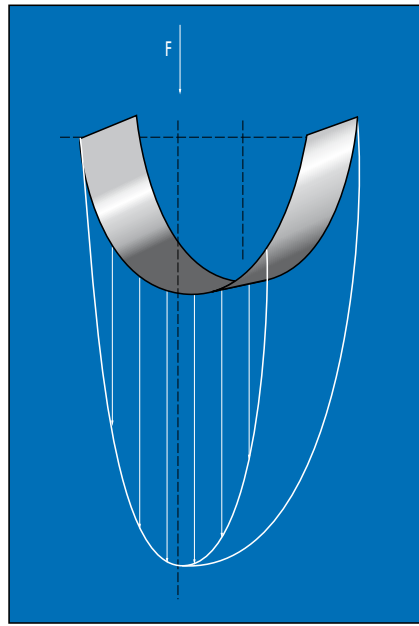
$$L_2 = (D - S) \times 3,11 - 0,5$$



Groove length L	Profile thickness S	Article No.
8	2,5	24226174
9,7	2,5	24102775
10	2,5	24102563
12	2,5	24099191
15	2,5	24102564
20	2,5	24076217
25	2,5	24107955
15	4,0	24160019
20	4,0	24238052
25	4,0	24148093

Surface force

The pressure distribution on the guide rings is non-linear. The non-linear pressure curve over the contact range was taken into account when calculating the permissible specific surface pressure. The permissible load on the guide strip is calculated by multiplying the projected area with the permissible specific surface pressure. However, the figure for the permissible specific surface pressure takes into account the possible angular offset of the piston when the recommended guide elements are used.



$$F = P \times A$$

$$H = F / (d \times P)$$

H = guide strip width [mm]

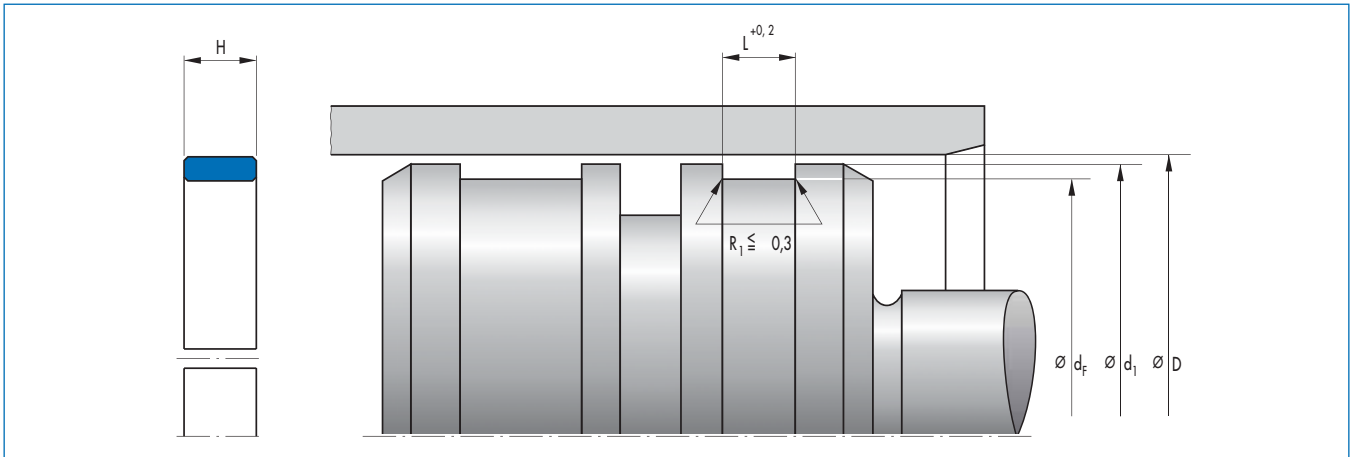
F = radial loading [N]

A = projected area [mm²]

P = perm. compression per unit area [N/mm²]

d = rod diameter with rod guidance;
piston diameter with
piston guidance [mm].

Article list

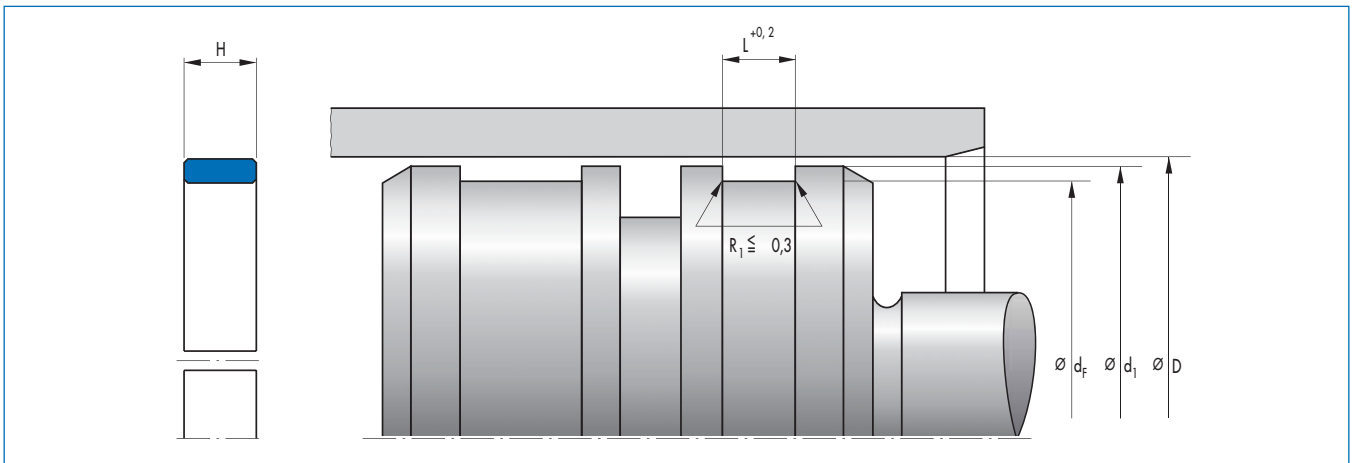


D	d _F	d ₁	L	H	Profile	Material	Article No.	
20	17	19,2	5,6	5,5	1,5	PTFE B500	24300179	○
22	19	21,2	5,6	5,5	1,5	PTFE B500	24300180	○
25	22	24,2	5,6	5,5	1,5	PTFE B500	24300182	○
28	25	27,2	5,6	5,5	1,5	PTFE B500	24300183	○
30	27	29,2	5,6	5,5	1,5	PTFE B500	24300184	○
32	29	31,2	5,6	5,5	1,5	PTFE B500	24300185	○
35	32	34,2	5,6	5,5	1,5	PTFE B500	24300186	○
36	33	35,2	5,6	5,5	1,5	PTFE B500	24300187	○
40	35	38,8	5,6	5,5	2,5	PTFE B500	24168850	○
40	37	39,2	5,6	5,5	1,5	PTFE B500	24300188	○
42	37	40,8	5,6	5,5	2,5	PTFE B500	24300189	○
45	40	43,8	5,6	5,5	2,5	PTFE B500	24108647	●
45	42	44,2	5,6	5,5	1,5	PTFE B500	24312965	○
50	45	48,8	5,6	5,5	2,5	PTFE B500	24162171	●
50	45	48,8	9,7	9,6	2,5	PTFE B500	24340072	○
55	50	53,8	5,6	5,5	2,5	PTFE B500	24300190	●
56	51	54,8	5,6	5,5	2,5	PTFE B500	24260615	○
60	55	58,8	5,6	5,5	2,5	PTFE B500	24210205	○
60	55	58,8	9,7	9,6	2,5	PTFE B500	24163238	○
63	58	61,8	9,7	9,6	2,5	PTFE B500	24169847	●
65	60	63,8	9,7	9,6	2,5	PTFE B500	24300192	○
70	65	68,8	9,7	9,6	2,5	PTFE B500	24165146	○
70	65	68,8	15	14,8	2,5	PTFE B500	24338058	○
75	70	73,8	9,7	9,6	2,5	PTFE B500	24300193	○
76	71	74,8	9,7	9,6	2,5	PTFE B500	24264453	○
80	75	78,8	9,7	9,6	2,5	PTFE B500	24217207	●
85	80	83,8	9,7	9,6	2,5	PTFE B500	24169641	○
85	80	83,8	15	14,8	2,5	PTFE B500	24258738	○
90	85	88,8	9,7	9,6	2,5	PTFE B500	24165145	●
90	85	88,8	15	14,8	2,5	PTFE B500	24164295	○
90	85	88,8	20	19,5	2,5	PTFE B500	24229424	○
95	90	93,8	9,7	9,6	2,5	PTFE B500	24300197	○
95	90	93,8	15	14,8	2,5	PTFE B500	24343224	○
100	95	98,8	9,7	9,6	2,5	PTFE B500	24153611	●
100	95	98,8	15	14,8	2,5	PTFE B500	24165294	○
100	95	98,8	25	24,5	2,5	PTFE B500	24311931	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d _F	d ₁	L	H	Profile	Material	Article No.	
105	100	103,8	9,7	9,6	2,5	PTFE B500	24216699	●
105	100	103,8	25	24,5	2,5	PTFE B500	24333282	○
110	105	108,8	9,7	9,6	2,5	PTFE B500	24165147	○
110	105	108,8	15	14,8	2,5	PTFE B500	24291125	○
110	105	108,8	20	19,5	2,5	PTFE B500	24243431	○
115	110	113,8	9,7	9,6	2,5	PTFE B500	24153613	○
120	115	118,4	15	14,8	2,5	PTFE B500	24300203	○
120	115	118,8	9,7	9,6	2,5	PTFE B500	24166736	●
125	120	123,4	9,7	9,6	2,5	PTFE B500	24204056	●
125	120	123,8	15	14,8	2,5	PTFE B500	24165043	○
130	125	128,4	15	14,8	2,5	PTFE B500	24300206	○
130	125	128,8	9,7	9,6	2,5	PTFE B500	24153612	●
130	125	128,8	20	19,5	2,5	PTFE B500	24166634	○
135	130	133,8	9,7	9,6	2,5	PTFE B500	24203611	○
135	130	133,8	15	14,8	2,5	PTFE B500	24340099	○
140	135	138,8	9,7	9,6	2,5	PTFE B500	24102436	●
140	135	138,8	15	14,8	2,5	PTFE B500	24236467	○
140	135	138,8	20	19,5	2,5	PTFE B500	24339882	○
140	135	138,8	25	24,5	2,5	PTFE B500	24338745	○
150	145	148,8	9,7	9,6	2,5	PTFE B500	24300208	●
150	145	148,8	15	14,8	2,5	PTFE B500	24169689	○
150	145	148,8	20	19,5	2,5	PTFE B500	24336312	○
150	145	148,8	25	24,5	2,5	PTFE B500	24243485	○
155	150	153,8	9,7	9,6	2,5	PTFE B500	24169405	○
160	155	158,8	9,7	9,6	2,5	PTFE B500	24168887	●
160	155	158,8	15	14,8	2,5	PTFE B500	24300209	●
160	155	158,8	20	19,5	2,5	PTFE B500	24217554	○
170	165	168,4	15	14,8	2,5	PTFE B500	24300211	○
170	165	168,8	9,7	9,6	2,5	PTFE B500	24300210	○
170	165	168,8	20	19,5	2,5	PTFE B500	24336310	○
180	175	178,4	15	14,8	2,5	PTFE B500	24219351	●
180	175	178,8	9,7	9,6	2,5	PTFE B500	24203474	●
180	175	178,8	25	24,5	2,5	PTFE B500	24258396	○
190	185	188,4	15	14,8	2,5	PTFE B500	24300213	●
190	185	188,8	9,7	9,6	2,5	PTFE B500	24300212	○
200	195	198,4	9,7	9,6	2,5	PTFE B500	24300214	○
200	195	198,8	15	14,8	2,5	PTFE B500	24300215	●
200	195	198,8	20	19,5	2,5	PTFE B500	24227497	○
200	195	198,8	25	24,5	2,5	PTFE B500	24306765	○
210	205	208,4	15	14,8	2,5	PTFE B500	24236228	○
210	205	208,8	9,7	9,6	2,5	PTFE B500	24301068	○
220	215	218,4	15	14,8	2,5	PTFE B500	24203911	●
220	215	218,4	20	19,5	2,5	PTFE B500	24340941	○
220	215	218,4	25	24,5	2,5	PTFE B500	24290417	○
220	215	218,8	9,7	9,6	2,5	PTFE B500	24300216	○
225	220	223,4	9,7	9,6	2,5	PTFE B500	24259939	○
225	220	223,4	15	14,8	2,5	PTFE B500	24169846	○
225	220	223,4	20	19,5	2,5	PTFE B500	24260604	○
225	220	223,4	25	24,5	2,5	PTFE B500	24298509	○
230	225	228,4	15	14,8	2,5	PTFE B500	24338432	○

● Available from stock ○ On request: Tool is available, delivery at short notice

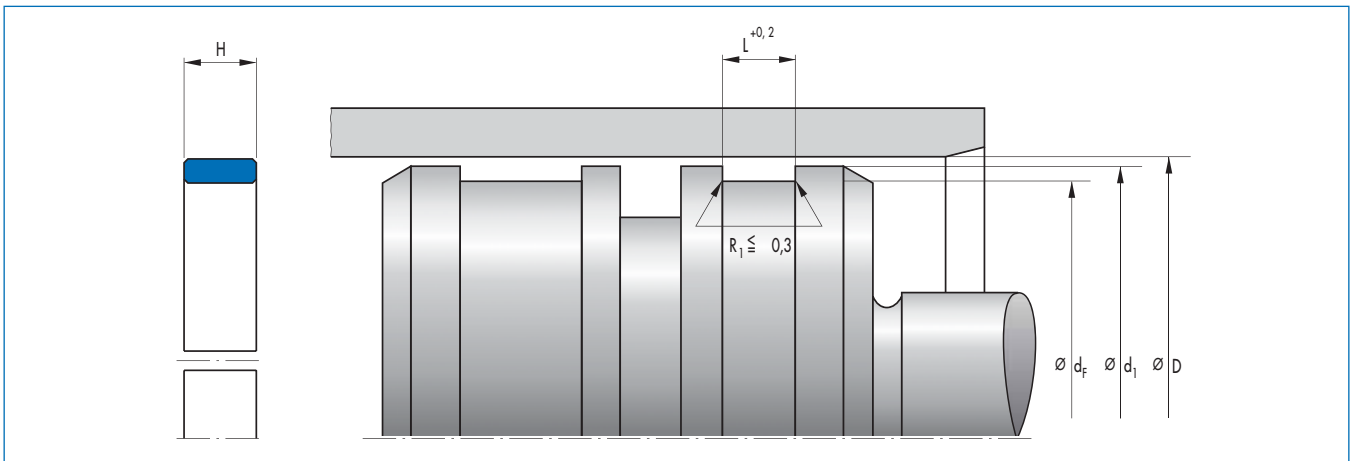


D	d _F	d ₁	L	H	Profile	Material	Article No.	
230	225	228,4	20	19,5	2,5	PTFE B500	24233567	○
240	235	238,4	15	14,8	2,5	PTFE B500	24167876	○
250	245	248,4	9,7	9,6	2,5	PTFE B500	24344263	○
250	245	248,4	15	14,8	2,5	PTFE B500	24300217	●
250	245	248,4	20	19,5	2,5	PTFE B500	24338719	○
260	255	258,4	15	14,8	2,5	PTFE B500	24300218	○
260	255	258,4	25	24,5	2,5	PTFE B500	24293567	○
270	265	268,4	15	14,8	2,5	PTFE B500	24238840	○
270	265	268,4	25	24,5	2,5	PTFE B500	24332002	○
280	275	278,4	15	14,8	2,5	PTFE B500	24300219	●
280	275	278,4	20	19,5	2,5	PTFE B500	24153362	○
280	275	278,4	25	24,5	2,5	PTFE B500	24203990	○
300	295	298,4	15	14,8	2,5	PTFE B500	24137238	○
300	295	298,4	25	24,5	2,5	PTFE B500	24134951	○
305	300	303,4	15	14,8	2,5	PTFE B500	24350592	○
310	305	308,4	25	24,5	2,5	PTFE B500	24237194	○
320	312	317,5	20	19,5	4	PTFE B500	24245663	○
320	315	318,4	15	14,8	2,5	PTFE B500	24300220	○
320	315	318,4	20	19,5	2,5	PTFE B500	24231223	○
320	315	318,4	25	24,5	2,5	PTFE B500	24300221	○
330	325	328,4	15	14,8	2,5	PTFE B500	24296714	○
330	325	328,4	25	24,5	2,5	PTFE B500	24314011	○
340	335	338,4	15	14,8	2,5	PTFE B500	24300222	○
340	335	338,4	25	24,5	2,5	PTFE B500	24300223	○
350	345	348,4	9,7	9,6	2,5	PTFE B500	24316713	○
350	345	348,4	15	14,8	2,5	PTFE B500	24234725	○
355	350	353,4	25	24,5	2,5	PTFE B500	24336608	○
360	352	357,5	15	14,8	4	PTFE B500	24266168	○
360	352	357,5	25	24,5	4	PTFE B500	24298511	○
360	355	358,4	15	14,8	2,5	PTFE B500	24300224	○
360	355	358,4	25	24,5	2,5	PTFE B500	24164558	○
380	375	378,4	20	19,5	2,5	PTFE B500	24257157	○
380	375	378,4	25	24,5	2,5	PTFE B500	24299555	○
390	382	387,5	25	24,5	4	PTFE B500	24344184	○
390	385	388,4	20	19,5	2,5	PTFE B500	24248042	○
390	385	388,4	25	24,5	2,5	PTFE B500	24215936	○
400	392	397,5	25	24,5	4	PTFE B500	24353170	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d _F	d ₁	L	H	Profile	Material	Article No.	
400	395	398,4	15	14,8	2,5	PTFE B500	24300225	○
400	395	398,4	20	19,5	2,5	PTFE B500	24241924	○
400	395	398,4	25	24,5	2,5	PTFE B500	24237477	○
410	405	408,4	25	24,5	2,5	PTFE B500	24292267	○
420	415	418,4	20	19,5	2,5	PTFE B500	24246829	○
420	415	418,4	25	24,5	2,5	PTFE B500	24298563	○
430	425	428,4	15	14,8	2,5	PTFE B500	24274579	○
430	425	428,4	25	24,5	2,5	PTFE B500	24356343	○
440	435	438,4	15	14,8	2,5	PTFE B500	24362293	○
440	435	438,4	25	24,5	2,5	PTFE B500	24238056	○
445	440	443,4	25	24,5	2,5	PTFE B500	24169312	○
450	442	447,5	25	24,5	4	PTFE B500	24336064	○
450	445	448,4	15	14,8	2,5	PTFE B500	24295904	○
450	445	448,4	20	19,5	2,5	PTFE B500	24218386	○
450	445	448,4	25	24,5	2,5	PTFE B500	24339916	○
457,2	449,2	454,7	25	24,5	4	PTFE B500	24361018	○
460	455	458,4	15	14,8	2,5	PTFE B500	24237495	○
460	455	458,4	20	19,5	2,5	PTFE B500	24216297	○
460	455	458,4	25	24,5	2,5	PTFE B500	24258000	○
480	472	477,5	25	24,5	4	PTFE B500	24298510	○
480	475	478,4	25	24,5	2,5	PTFE B500	24250182	○
500	492	497,5	15	14,8	4	PTFE B500	24344266	○
500	492	497,5	25	24,5	4	PTFE B500	24261230	○
500	495	498,4	15	14,8	2,5	PTFE B500	24274580	○
500	495	498,4	25	24,5	2,5	PTFE B500	24263977	○
510	505	508,4	15	14,8	2,5	PTFE B500	24291161	○
510	505	508,4	25	24,5	2,5	PTFE B500	24360396	○
510,2	502,2	507,7	25	24,5	4	PTFE B500	24355928	○
520	515	518,4	20	19,5	2,5	PTFE B500	24230163	○
520,7	515,7	519,1	15	14,8	2,5	PTFE B500	24224011	○
530	525	528,4	15	14,8	2,5	PTFE B500	24258834	○
540	535	538,4	25	24,5	2,5	PTFE B500	24339008	○
545	540	543,4	25	24,5	2,5	PTFE B500	24250579	○
550	545	548,4	25	24,5	2,5	PTFE B500	24257339	○
560	552	557,5	25	24,5	4	PTFE B500	24359710	○
560	555	558,4	15	14,8	2,5	PTFE B500	24351466	○
560	555	558,4	25	24,5	2,5	PTFE B500	24269185	○
570	562	567,5	15	14,8	4	PTFE B500	24352095	○
570	562	567,5	25	24,5	4	PTFE B500	24351060	○
580	572	577,5	15	14,8	4	PTFE B500	24344267	○
580	575	578,4	25	24,5	2,5	PTFE B500	24339500	○
584,2	576,2	581,7	25	24,5	4	PTFE B500	24362368	○
600	592	597,5	25	24,5	4	PTFE B500	24275000	○
600	595	598,4	15	14,8	2,5	PTFE B500	24234910	○
600	595	598,4	20	19,5	2,5	PTFE B500	24329803	○
600	595	598,4	25	24,5	2,5	PTFE B500	24234912	○
625	620	623,4	15	14,8	2,5	PTFE B500	24352637	○
630	625	628,4	15	14,8	2,5	PTFE B500	24161640	○
630	625	628,4	25	24,5	2,5	PTFE B500	24263466	○
640	632	637,5	25	24,5	4	PTFE B500	24275167	○

● Available from stock ○ On request: Tool is available, delivery at short notice



D	d _F	d ₁	L	H	Profile	Material	Article No.	
650	642	647,5	25	24,5	4	PTFE B500	24358984	○
650	645	648,4	25	24,5	2,5	PTFE B500	24239182	○
655	650	653,4	25	24,5	2,5	PTFE B500	24231930	○
660,4	652,4	657,9	25	24,5	4	PTFE B500	24361508	○
665	660	663,4	25	24,5	2,5	PTFE B500	24336379	○
680	672	677,5	15	14,8	4	PTFE B500	24344269	○
680	672	677,5	25	24,5	4	PTFE B500	24298430	○
680	675	678,4	25	24,5	2,5	PTFE B500	24357190	○
690	682	687,5	25	24,5	4	PTFE B500	24361405	○
700	692	697,5	25	24,5	4	PTFE B500	24349705	○
700	695	698,4	15	14,8	2,5	PTFE B500	24275183	○
700	695	698,4	25	24,5	2,5	PTFE B500	24338859	○
710	705	708,4	20	19,5	2,5	PTFE B500	24162128	○
720	712	717,5	20	19,5	4	PTFE B500	24226253	○
720	712	717,5	25	24,5	4	PTFE B500	24355876	○
720	715	718,4	15	14,8	2,5	PTFE B500	24348252	○
720	715	718,4	20	19,5	2,5	PTFE B500	24291417	○
720	715	718,4	25	24,5	2,5	PTFE B500	24240256	○
725	720	723,4	25	24,5	2,5	PTFE B500	24340198	○
750	742	747,5	25	24,5	4	PTFE B500	24293964	○
760	752	757,5	15	14,8	4	PTFE B500	24216171	○
760	752	757,5	20	19,5	4	PTFE B500	24216170	○
760	755	758,4	25	24,5	2,5	PTFE B500	24162992	○
770	762	767,5	15	14,8	4	PTFE B500	24344270	○
775	770	773,4	25	24,5	2,5	PTFE B500	24245794	○
780	775	778,4	15	14,8	2,5	PTFE B500	24358668	○
800	792	797,5	15	14,8	4	PTFE B500	24348279	○
800	792	797,5	25	24,5	4	PTFE B500	24243176	○
812,8	804,8	810,3	25	24,5	4	PTFE B500	24249318	○
820	812	817,5	25	24,5	4	PTFE B500	24341042	○
830	822	827,5	25	24,5	4	PTFE B500	24354856	○
830	825	828,4	25	24,5	2,5	PTFE B500	24353637	○
850	842	847,5	25	24,5	4	PTFE B500	24300402	○
850	845	848,4	20	19,5	2,5	PTFE B500	24265124	○
850	845	848,4	25	24,5	2,5	PTFE B500	24163721	○
900	892	897,5	20	19,5	4	PTFE B500	24238053	○
900	892	897,5	25	24,5	4	PTFE B500	24344380	○

● Available from stock ○ On request: Tool is available, delivery at short notice

D	d _F	d ₁	L	H	Profile	Material	Article No.	
900	895	898,4	25	24,5	2,5	PTFE B500	24162990	○
914,5	906,5	912	25	24,5	4	PTFE B500	24354414	○
920	915	918,4	25	24,5	2,5	PTFE B500	24258318	○
940	932	937,5	25	24,5	4	PTFE B500	24352164	○
940	935	938,4	25	24,5	2,5	PTFE B500	24163720	○
965	957	962,5	15	14,8	4	PTFE B500	24263608	○
965	957	962,5	25	24,5	4	PTFE B500	24295215	○
965,2	957,2	962,7	25	24,5	4	PTFE B500	24331520	○
1000	995	998,4	25	24,5	2,5	PTFE B500	24162989	○
1050	1042	1047,5	25	24,5	4	PTFE B500	24257242	○
1050	1045	1048,4	25	24,5	2,5	PTFE B500	24227975	○
1100	1092	1097,5	25	24,5	4	PTFE B500	24269869	○
1140	1132	1137,5	20	19,5	4	PTFE B500	24167297	○
1180	1172	1177,5	25	24,5	4	PTFE B500	24361406	○
1200	1192	1197,5	15	14,8	4	PTFE B500	24359446	○
1300	1292	1297,5	25	24,5	4	PTFE B500	24357283	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Guide Ring FRI

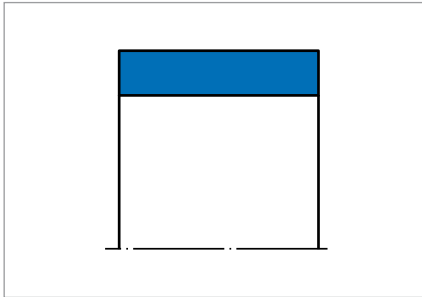


Fig. 1 Merkel Guide Ring FRI

Product description

Slit, non-metallic Merkel Guide Ring FRI.

Product advantages

Non-metallic guide element for rods; for standardised housings amongst others, according to ISO 10766

- No seizure due to metal/plastic materials combination
- Medium load-bearing capacity
- Chamfered profile edges prevent pressing of edge into the corner radii of the housing groove
- Simple snap-in fitting.

Application

Earth moving equipment, industrial vehicles, agricultural machinery, cranes.

Material

Material	Code
Filled polyamide	PA 4112

Operating conditions

Material	PA 4112 (filled polyamide)
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +100
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +50
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +100
Running speed in m/s	1
Load (permitted specific surface pressure*)	≤40 N/mm ² at 20 °C ≤30 N/mm ² at 100 °C

* For the simple determination of the load, a constant surface pressure is calculated using the projected area (d x H). The actual surface pressure is clearly greater in the centre of the surface than the calculated surface pressure. This is taken into account in the value for the permissible specific surface pressure.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤2 µm	≤10,0 µm
Groove flanks	≤3 µm	≤15,0 µm

Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

d	D _F	D _{F1}
f8	H8	H9

The tolerances given are recommended values. The usage of the guide and tolerance definition are to be considered in connection with the seal employed. The diameter D_{F1} given in the table of dimensions is to be considered exclusively in relation to the guide ring. The corresponding diameter for the adjacent seal housing is to be matched to the sealing component.

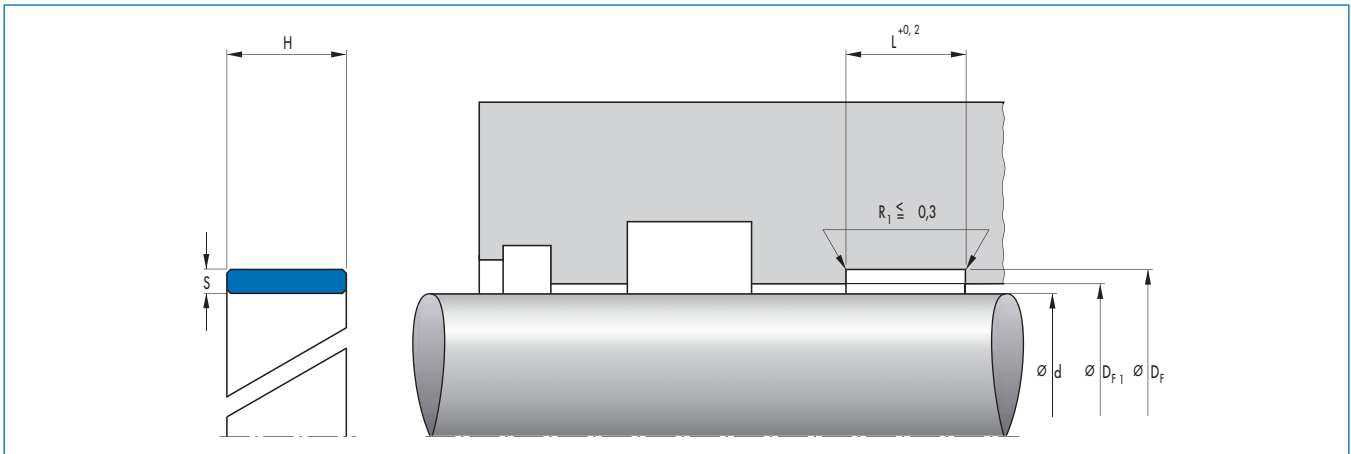
Manufacturing tolerance

Production tolerance profile thickness S
-0,1

Fitting & installation

Merkel Guide Ring FRI can be easily snapped into the housing groove. Careful fitting is a prerequisite for correct function. → Technical Manual.

Article list



d	D _F	L	H	D _{F1}	Profile	Material	Article No.	
20	23,1	4	3,9	20,4	1,55	PAGF Q04112	434219	●
25	28,1	4	3,9	25,4	1,55	PAGF Q04112	434220	●
30	33,1	4	3,9	30,4	1,55	PAGF Q04112	434221	●
32	35,1	4	3,9	32,4	1,55	PAGF Q04112	434222	●
36	41	5,6	5,4	36,4	2,5	PAGF Q04112	426463	●
40	45	5,6	5,4	40,4	2,5	PAGF Q04112	426464	●
45	50	5,6	5,4	45,4	2,5	PAGF Q04112	426465	●
50	55	9,7	9,5	50,4	2,5	PAGF Q04112	428805	●
56	61	9,7	9,5	56,4	2,5	PAGF Q04112	429273	●
60	65	9,7	9,5	60,5	2,5	PAGF Q04112	429318	●
63	68	9,7	9,5	63,5	2,5	PAGF Q04112	432260	●
65	70	9,7	9,5	65,5	2,5	PAGF Q04112	432261	○
70	75	9,7	9,5	70,5	2,5	PAGF Q04112	432262	●
80	85	9,7	9,5	80,5	2,5	PAGF Q04112	432264	●
90	95	9,7	9,5	90,6	2,5	PAGF Q04112	432266	●
100	105	9,7	9,5	100,6	2,5	PAGF Q04112	432267	●

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Guide Ring Guivex SBK

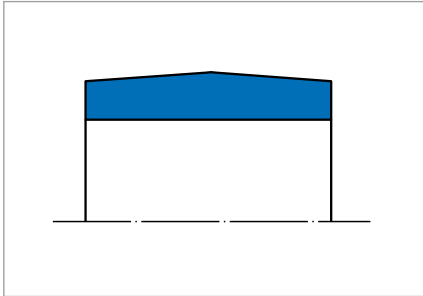


Fig. 1 Merkel Guide Ring Guivex SBK

Product description

Profiled Merkel Guide Ring Guivex SBK made from fabric-base laminate. Patented product design (patent-no.: PCT/EP95/03874).

Product advantages

Merkel SBK guide rings offer clear advantages over conventional guide strips/rings, designed for standardised housings according to ISO 10766 amongst others

- Interchangeable to existing operating environments of the types SB and SF
- High radial load
- Very good utilisation of the guide length through even distribution of stress
- Improved drawing-in of lubricating medium through optimised distribution of stress in the contact zone between guide ring and counter-acting surface
- Reduced stick-slip tendency
- Outstanding running behaviour with short guide distances (no clamping).

Application

Long stroke cylinders (piston rod bowing under load), short guide distances (lateral buckling of the piston rod), short stroke (inadequate lubrication) friction-optimised sealing systems, additional item for metal guides, mobile hydraulics, heavy-duty hydraulics.

Material

Ø range ≤300

Material	Code	Colour
Fabric-base laminate	HGW HG517	Dark grey
Fabric-base laminate	HGW HG650	Red

Ø range >300

Material	Code	Colour
Fabric-base laminate	HGW HG650	Red

Operating conditions

Material	HGW HG517/HGW HG650
Temperature range in °C	
Hydraulic oils HL, HLP	-40 ... +120
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-40 ... +60
HFD fluids	-40 ... +120
Water	+5 ... +60
HETG (rapeseed oil)	-40 ... +80
HEES (synthetic ester)	-40 ... +100
HEPG (glycol)	-40 ... +80
Mineral greases	-40 ... +120

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

The long-term behaviour of the sealing component as well as the security against early failures are primarily determined by the quality of the counter-acting surface. This means that the surface must be precisely described and evaluated. Based on current knowledge we recommend supplementing the above definition of the surface quality of the

sliding surface with the quantities in the following table. The previous general description of the material component is significantly improved with the new quantities from the material component, particularly with reference to the abrasiveness of the surface.

→ Technical Manual.

Design notes

The diameter D1 given in the table of dimensions is to be considered exclusively in relation to the guide bush. The corresponding diameter for the adjacent seal housing is to be matched to the sealing component.

Sliding surfaces

Characteristic value	Limit position
R_a	>0,05 mm ... 0,30 mm
R_{max}	<2,50 mm
R_{pkx}	<0,50 mm
R_{pk}	<0,50 mm
R_k	>0,25 mm ... 0,70 mm
R_{vk}	>0,20 mm ... 0,65 mm
R_{vkk}	>0,20 mm ... 2,00 mm

The limit values listed in the table are not currently applicable for ceramic or partial ceramic counter-surfaces.

Tolerance

Production tolerance profile thickness S
-0,01 ... -0,06

Surface load

The value for the specific compression per unit area is dependent on the operating temperature and the size of the elastic deformation (deflection) of the guide element. The maximum possible deflection is limited in a sealing system by the smallest gap dimension behind the primary seal. → Technical Manual.

Deflection

- e1 = 0,10 for s = 2,5
- e1 = 0,15 for s = 4,0
- e2 = 0,15 for s = 2,5
- e2 = 0,20 for s = 4,0

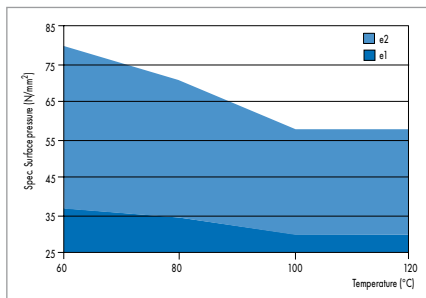
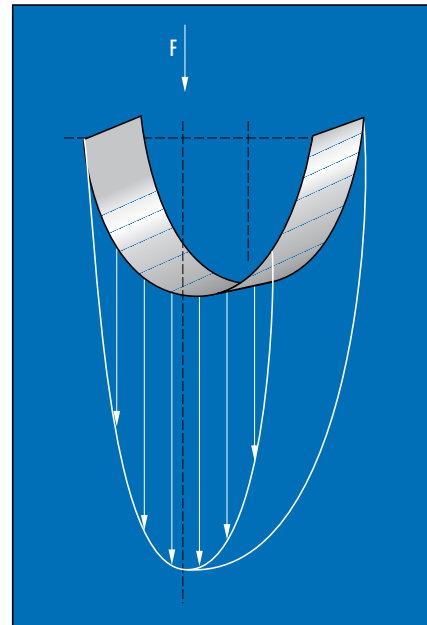


Fig. 2 Special surface pressure for parallel load

Radial load

The pressure distribution on the guide rings is non-linear. The non-linear pressure curve over the contact range was taken into account when calculating the permissible specific surface pressure. The required guide width can be calculated

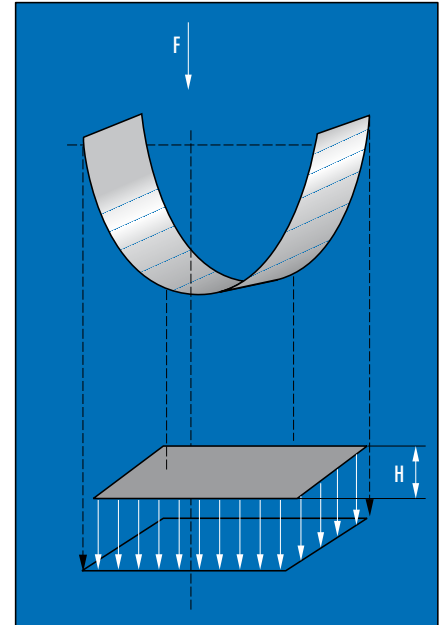


$$F = P \times A$$

$$H = F / (d \times P)$$

H = guide strip width [mm]
 F = radial load [N]
 A = projected area [mm²]

using the following formulas. Taking the increased service life into consideration, a reduction of the load by selection of a wide guide can make sense in individual cases.



P = perm. compression per unit area [N/mm²]
 d = rod diameter with rod guidance; piston diameter with piston guidance [mm].

Mode of operation

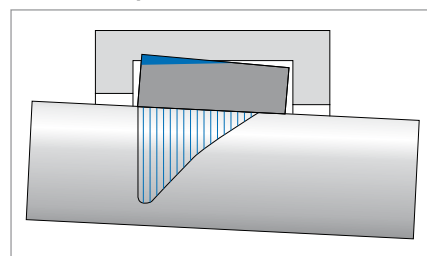


Fig. 3 Rectangular guide ring: stress peaks in the edge area

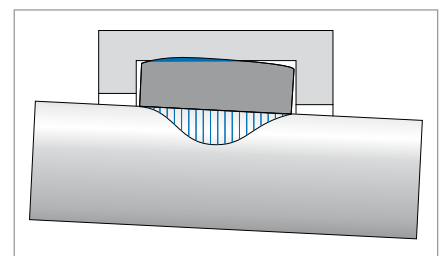
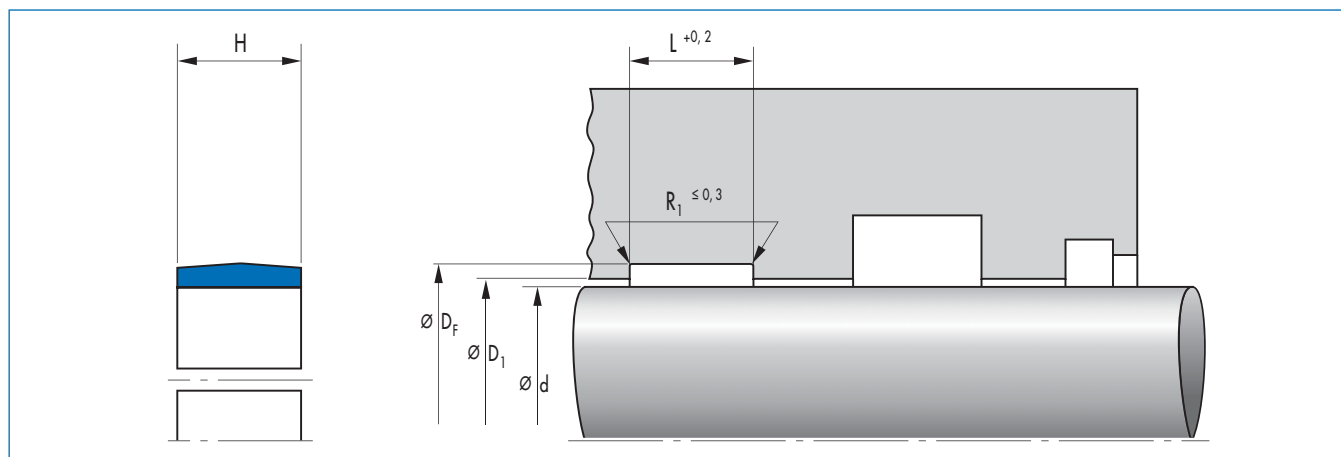


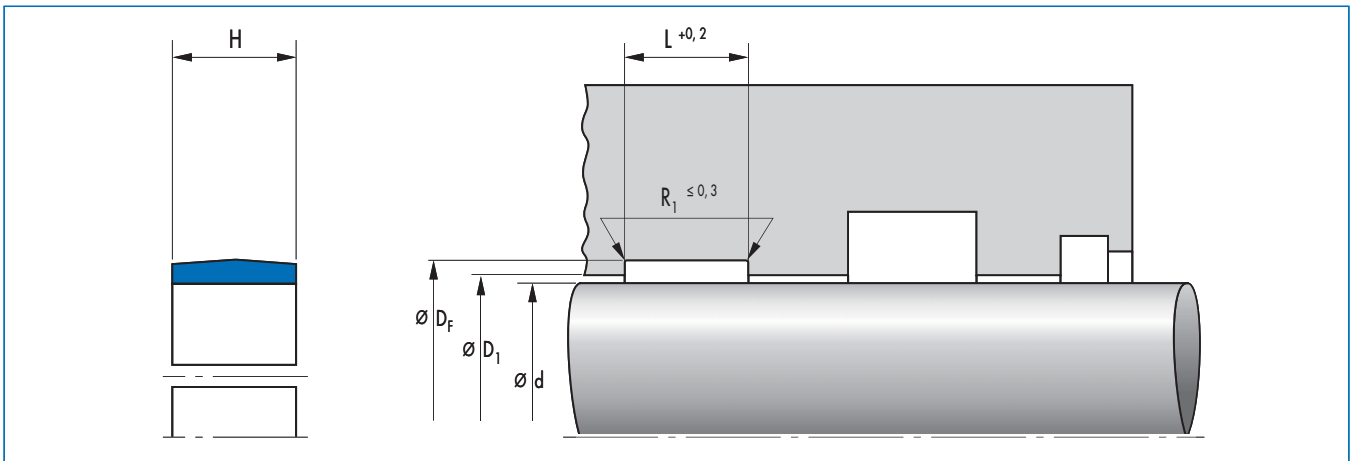
Fig. 4 Merkel Guide Ring Guivex SBK: even distribution of stress

Article list



d	D _F	D ₁	H	L	Profile	Material	Article No.	
25	30	30	9,5	9,7	2,5	HGW HG517	533551	○
28	31	29	5,5	5,6	1,5	HGW HG517	24375389	○
40	45	41,6	9,6	9,7	2,5	HGW HG517	24370469	●
45	50	46,6	9,6	9,7	2,5	HGW HG517	24375662	●
45	50	46,6	14,8	15	2,5	HGW HG517	24380507	○
50	55	51,6	9,6	9,7	2,5	HGW HG517	24367539	●
55	60	56,6	9,6	9,7	2,5	HGW HG517	524832	●
55	60	56,6	14,8	15	2,5	HGW HG517	24380889	○
60	65	61,6	14,8	15	2,5	HGW HG517	24375946	●
63	68	68	9,5	9,7	2,5	HGW HG517	49000672	○
65	70	66,6	9,5	9,7	2,5	HGW HG517	24367540	○
65	70	66,6	14,8	15	2,5	HGW HG517	24380160	○
70	75	71,6	9,6	9,7	2,5	HGW HG517	24367541	●
75	80	76,6	9,5	9,7	2,5	HGW HG517	528479	○
75	80	76,6	14,8	15	2,5	HGW HG517	529802	○
75	83	83	14,8	15	4	HGW HG517	49004925	○
78	83	83	19,8	20	2,5	HGW HG517	49002107	○
80	85	81,6	9,5	9,7	2,5	HGW HG517	24380101	●
80	85	81,6	14,8	15	2,5	HGW HG517	24370470	●
80	85	81,6	24,5	25	2,5	HGW HG517	24373284	●
80	88	88	14,8	15	4	HGW HG517	49004810	○
85	90	86,6	14,8	15	2,5	HGW HG517	24380161	○
90	95	91,6	14,8	15	2,5	HGW HG517	24379371	●
90	95	91,6	24,5	25	2,5	HGW HG517	528119	○
90	95	91,6	34,5	35	2,5	HGW HG517	24380556	○
90	98	92,5	19,8	20	4	HGW HG517	24359046	○
93	98	98	19,8	20	2,5	HGW HG517	49002108	○
95	100	96,6	14,8	15	2,5	HGW HG517	24379355	○
100	105	101,6	14,8	15	2,5	HGW HG517	24380162	●
100	105	101,6	19,8	20	2,5	HGW HG517	24379370	●
100	108	108	24,5	25	4	HGW HG517	49005018	○
110	113,2	111,6	14,5	15	1,6	HGW HG517	24358241	●
110	115	111,6	19,8	20	2,5	HGW HG517	24379369	○
110	115	111,6	24,5	25	2,5	HGW HG517	24377187	●
110	118	112,5	14,8	15	4	HGW HG517	24358242	○
112	117	117	19,8	20	2,5	HGW HG517	49000534	○

● Available from stock ○ On request: Tool is available, delivery at short notice

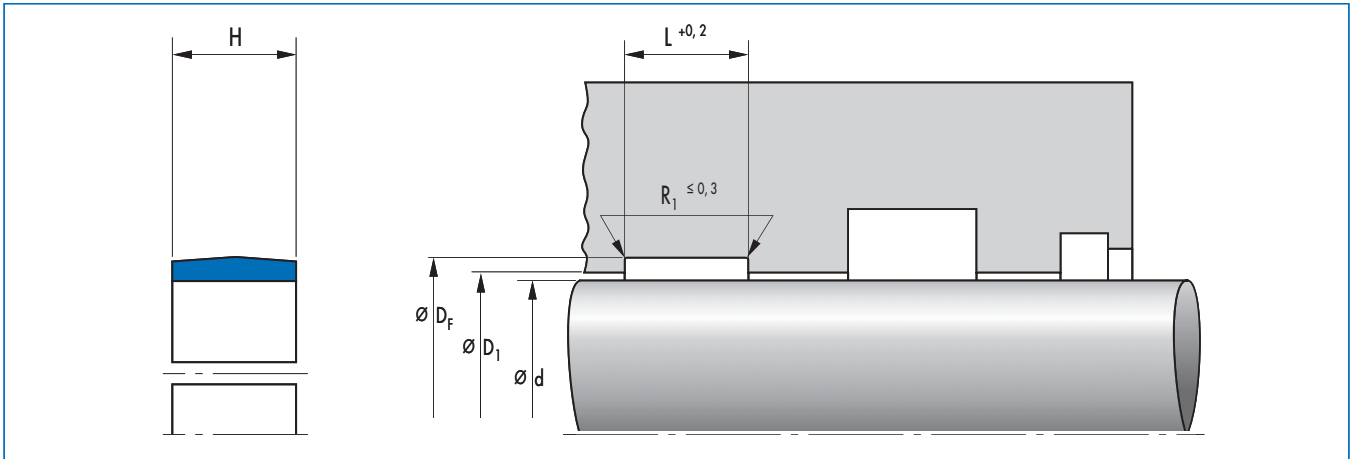


d	DF	D1	H	L	Profile	Material	Article No.	
120	125	121,6	14,8	15	2,5	HGW HG517	525470	○
120	125	121,6	19,8	20	2,5	HGW HG517	529483	○
120	125	121,6	34,5	35	2,5	HGW HG517	24380557	○
125	130	126,6	14,8	15	2,5	HGW HG517	24380163	○
125	130	126,6	24,5	25	2,5	HGW HG517	24379074	○
140	145	141,6	24,5	25	2,5	HGW HG517	528820	●
140	148	142,5	39,5	40	4	HGW HG517	528995	○
145	150	146,6	14,8	15	2,5	HGW HG517	24380690	●
155	160	156,6	14,8	15	2,5	HGW HG517	24380691	●
160	165	161,6	14,8	15	2,5	HGW HG517	24380782	○
160	165	161,6	24,5	25	2,5	HGW HG517	24375641	●
160	168	162,5	39,5	40	4	HGW HG517	24370365	●
170	175	171,6	14,8	15	2,5	HGW HG517	24380692	●
170	175	171,6	24,5	25	2,5	HGW HG517	524993	○
170	178	172,5	24,5	25	4	HGW HG517	530870	○
170	178	172,5	39,5	40	4	HGW HG517	24378034	○
180	185	181,6	14,8	15	2,5	HGW HG517	24380693	●
180	185	181,6	24,5	25	2,5	HGW HG517	24379035	○
180	185	181,6	29,5	30	2,5	HGW HG517	526594	○
180	185	181,6	39,5	40	2,5	HGW HG517	530602	○
180	188	182,5	39,5	40	4	HGW HG517	24378035	○
190	195	191,6	14,8	15	2,5	HGW HG517	24380270	○
190	198	198	34,5	35	4	HGW HG517	49002019	○
200	205	201,6	14,8	15	2,5	HGW HG517	24380775	○
200	205	201,6	24,5	25	2,5	HGW HG517	24379075	○
200	205	201,6	34,5	35	2,5	HGW HG517	24378003	○
200	208	202,5	39,5	40	4	HGW HG517	24378036	○
210	215	211,6	14,8	15	2,5	HGW HG517	24380694	●
210	218	212,5	24,5	25	4	HGW HG517	530265	○
220	225	221,6	14,8	15	2,5	HGW HG517	24372435	○
220	225	221,6	24,5	25	2,5	HGW HG517	24379036	○
220	228	222,5	39,5	40	4	HGW HG517	24378037	○
230	235	231,6	14,8	15	2,5	HGW HG517	24380269	○
230	235	231,6	24,5	25	2,5	HGW HG517	24379253	○
240	245	241,6	14,8	15	2,5	HGW HG517	24380255	○
240	245	241,6	24,5	25	2,5	HGW HG517	530267	○
240	248	242,5	39,5	40	4	HGW HG517	24378038	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D _F	D ₁	H	L	Profile	Material	Article No.	
250	255	251,6	14,8	15	2,5	HGW HG517	24380273	○
250	255	251,6	24,5	25	2,5	HGW HG517	24379037	○
250	256	251,6	24,5	25	3	HGW HG517	49002878	○
255	260	260	24,5	25	2,5	HGW HG517	49002907	○
260	268	262,5	39,5	40	4	HGW HG517	24378039	○
260	268	268	24,5	25	4	HGW HG517	49003297	○
270	275	271,6	24,5	25	2,5	HGW HG517	24380271	●
280	285	281,6	14,8	15	2,5	HGW HG517	24380777	○
280	285	281,6	24,5	25	2,5	HGW HG517	24379038	●
280	288	282,5	34,5	35	4	HGW HG517	24379347	○
280	288	282,5	39,5	40	4	HGW HG517	24378040	○
280	288	288	14,8	15	4	HGW HG517	24379158	○
290	298	292,5	24,5	25	4	HGW HG517	24379491	○
292	297	293,6	24,5	25	2,5	HGW HG517	528857	○
300	308	302,5	24,5	25	4	HGW HG600	24380482	●
300	308	302,5	39,5	40	4	HGW HG600	24379155	●
320	325	321,6	14,8	15	2,5	HGW HG600	24380778	○
320	325	321,6	24,5	25	2,5	HGW HG600	24380272	●
320	328	322,5	24,5	25	4	HGW HG600	24379076	○
320	328	322,5	29,5	30	4	HGW HG600	528486	○
320	328	328	39,5	40	4	HGW HG600	532132	○
330	338	332,5	24,5	25	4	HGW HG600	24379040	○
350	355	351,6	14,8	15	2,5	HGW HG600	24380779	○
350	358	352,5	24,5	25	4	HGW HG600	24379041	○
360	365	361,6	24,5	25	2,5	HGW HG600	24380275	○
360	368	362,5	24,5	25	4	HGW HG600	24375318	●
360	368	368	39,5	40	4	HGW HG600	531873	○
370	378	372,5	24,5	25	4	HGW HG600	24379042	○
370	378	378	34,5	35	4	HGW HG600	49000975	○
380	385	385	24,5	25	2,5	HGW HG600	531516	○
380	388	382,5	24,5	25	4	HGW HG600	24379138	○
380	388	382,5	39,5	40	4	HGW HG600	24379245	●
390	395	391,6	24,5	25	2,5	HGW HG600	24380276	○
400	405	401,6	14,8	15	2,5	HGW HG600	24380781	○
400	405	405	24,5	25	2,5	HGW HG600	49012525	○
400	408	402,5	24,5	25	4	HGW HG600	24375319	●
400	408	402,5	39,5	40	4	HGW HG600	526027	○
420	425	421,5	24,5	25	2,5	HGW HG600	527921	●
420	428	422,5	39,5	40	4	HGW HG600	24379322	○
440	448	442,5	19,8	20	4	HGW HG600	24378391	○
440	448	442,5	24,5	25	4	HGW HG600	24375320	●
440	448	442,5	39,5	40	4	HGW HG600	526028	●
445	453	453	39,5	40	4	HGW HG600	49004008	○
450	458	452,5	24,5	25	4	HGW HG600	24380453	○
460	465	465	24,5	25	2,5	HGW HG600	49001818	○
460	468	462,5	24,5	25	4	HGW HG600	24375321	●
500	508	502,5	19,8	20	4	HGW HG600	24378392	○
500	508	502,5	24,5	25	4	HGW HG600	24375322	●
500	508	502,5	39,5	40	4	HGW HG600	24379324	○
510	518	512,5	24,5	25	4	HGW HG600	530266	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D _F	D ₁	H	L	Profile	Material	Article No.	
530	538	532,5	24,5	25	4	HGW HG600	24375323	●
530	538	538	39,5	40	4	HGW HG600	49004922	○
540	548	548	39,5	40	4	HGW HG600	49018518	○
550	558	558	24,5	25	4	HGW HG600	49016779	○
550	558	558	39,5	40	4	HGW HG600	49005155	○
560	568	562,5	24,5	25	4	HGW HG600	24375324	●
600	605	601,5	24,5	25	2,5	HGW HG600	528326	●
600	608	602,5	24,5	25	4	HGW HG600	24375325	●
600	608	608	39,5	40	4	HGW HG600	49003964	○
630	638	632,5	24,5	15	4	HGW HG600	524927	●
650	658	652,5	34,5	35	4	HGW HG600	24378494	○
700	708	702,5	39,5	40	4	HGW HG600	529519	●
710	718	718	24,5	25	4	HGW HG600	49017422	○
710	718	718	39,5	40	4	HGW HG600	49012632	○
730	738	738	39,5	40	4	HGW HG600	49015646	○
740	748	748	24,5	25	4	HGW HG600	49000239	○
760	768	762,5	24,5	25	4	HGW HG600	24380545	○
790	798	798	19,8	20	4	HGW HG600	531677	○
790	798	798	34,5	35	4	HGW HG600	49003032	○
790	798	798	39,5	40	4	HGW HG600	49015647	○
800	808	802,5	24,5	25	4	HGW HG600	526190	●
820	828	822,5	24,5	25	4	HGW HG600	528715	●
820	828	822,5	39,5	40	4	HGW HG600	528716	●
890	898	898	19,8	20	4	HGW HG600	49003043	○
890	898	898	34,5	35	4	HGW HG600	49020525	○
970	978	972,5	24,5	25	4	HGW HG600	24376186	○
990	996,3	991,6	29,5	30	3,15	HGW HG600	49004975	○
1000	1008	1008	24,5	25	4	HGW HG600	49017423	○
1100	1108	1108	24,5	25	4	HGW HG600	49017424	○
1100	1108	1108	34,5	35	4	HGW HG600	533289	○
1130	1138	1132,5	24,5	25	4	HGW HG600	530019	●
1145	1153	1153	39,5	40	4	HGW HG600	49002141	○
1340	1348	1342,5	39,5	40	4	HGW HG600	531144	○
1350	1358	1358	39,5	40	4	HGW HG600	531904	○
1625,6	1633,6	1628,1	39,5	40	4	HGW HG600	528780	○
1626	1634	1628,5	39,5	40	4	HGW HG600	527116	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Guide Ring SB

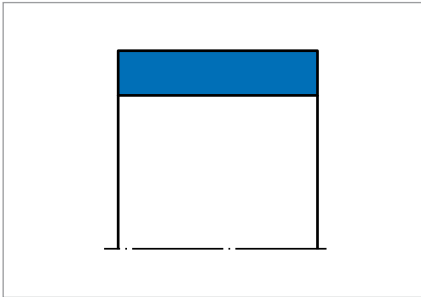


Fig. 1 Merkel Guide Ring SB

Product description

Non-metallic Merkel Rod Guide Ring SB.

Product advantages

As a non-metallic guide element for rods, also for standardised housings according to ISO 10766

- Metal/fabric-base laminate materials combination prevents “seizing”
- High load-bearing capacity, elastic (not plastic) behaviour up to break point
- Chamfered profile edges prevent pressing of edge into the corner radii of the housing groove
- Simple snap-in fitting ($d \leq 300$).

Application

Earth moving equipment, industrial vehicles, agricultural machinery, cranes, injection moulding machines, loading platforms, steel hydraulics engineering, presses, support cylinders.

Material

Slotted Ring ≤ 300

Material	Code
Fabric-base laminate	HGW HG517
Fabric-base laminate	HGW HG650

Ready to fit strip cut to size >300

Material	Code
Fabric-base laminate	HGW HG600

Operating conditions

Material	HGW HG517/HGW HG600
	Temperature range in °C
Hydraulic oils HL, HLP	-40 ... +120
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-40 ... +60
HFD fluids	-40 ... +120
Water	+5 ... +60
HETG (rapeseed oil)	-40 ... +80
HEES (synthetic esters)	-40 ... +100
HEPG (glycol)	-40 ... +80
Mineral greases	-40 ... +120

Surface quality

Surface roughness	R_a	R_{max}
Sliding surface	0,05 ... 0,3 μm	$\leq 2,5 \mu\text{m}$
Groove base	$\leq 2 \mu\text{m}$	$\leq 10,0 \mu\text{m}$
Groove flanks	$\leq 3 \mu\text{m}$	$\leq 15,0 \mu\text{m}$

Percentage contact area $M_v > 50\%$ to max. 90% at cutting depth $c = R_z/2$ and reference line $C_{ref} = 0\%$.

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

D_f
H8

The tolerance definition for the dimensions D and d must be viewed in relation to the seal used. The diameter D_1 specified in the table of dimensions is to be viewed exclusively in connection with the guide ring. The corresponding diameter of an adjacent seal housing should be tailored to the sealing component.

Manufacturing tolerance

Profile thickness S
-0,02 ... -0,08

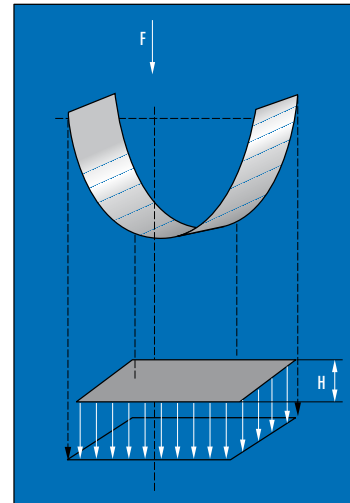
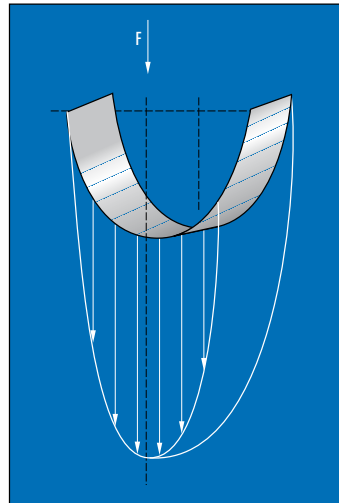
Surface load

Profile thickness S
p < 50 N/mm ² up to 60 °C
p < 25 N/mm ² up to 100 °C

For running speed, see sealing system.

Surface force

The pressure distribution on the guide rings is non-linear. The non-linear pressure curve over the contact range was taken into account when calculating the permissible specific surface pressure. The permissible load on the guide strip is calculated by multiplying the projected area with the permissible specific surface pressure. However, the figure for the permissible specific surface pressure takes into account the possible angular offset of the rods when using the recommended guide elements.

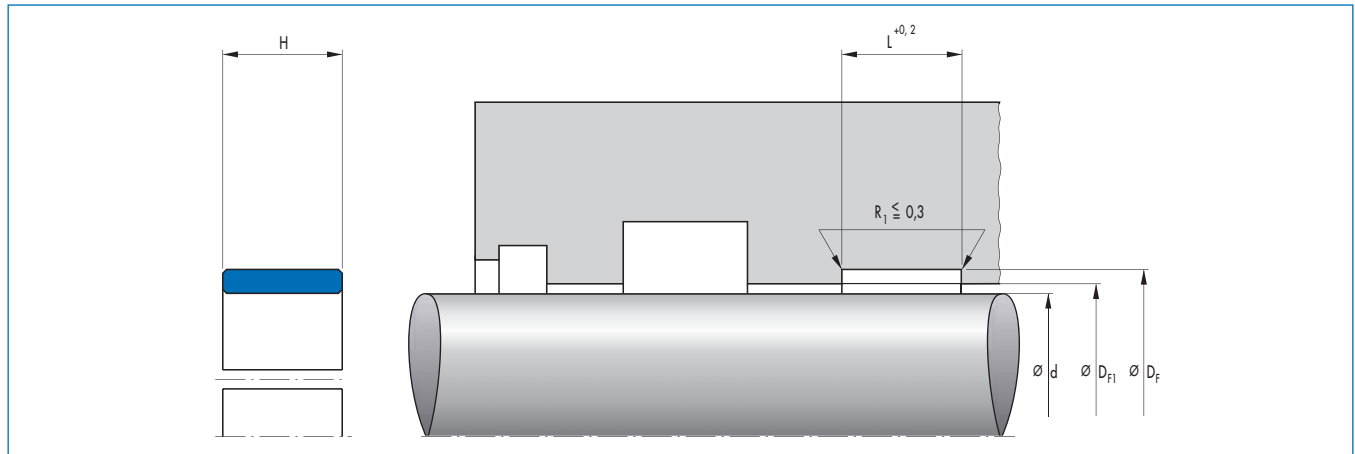


$$F = P \times A$$

$$H = F / (d \times P)$$

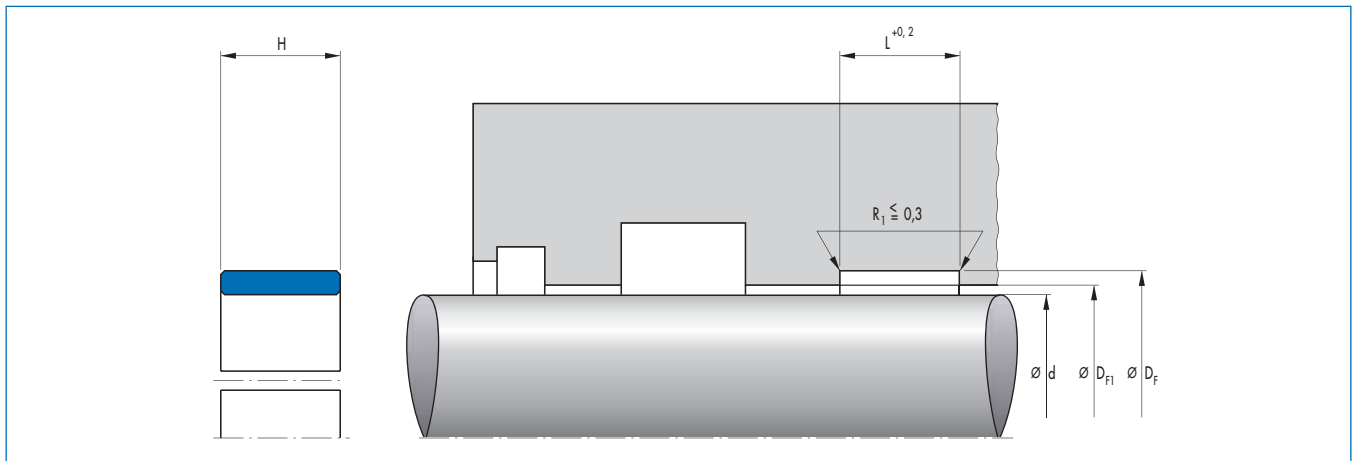
- H = guide strip width [mm]
- F = radial load [N]
- A = projected area [mm²]
- P = perm. compression per unit area [N/mm²]
- d = rod diameter with rod guidance; piston diameter with piston guidance [mm].

Article list



d	D _F	D _{F1}	H	L	Profile	Material	Article No.	
20	23	21	5,5	5,6	1,5	HGW HG517	24269402	○
22	25	23	5,5	5,6	1,5	HGW HG517	24288276	○
25	28	26	5,5	5,6	1,5	HGW HG517	24226044	●
28	31	29	5,5	5,6	1,5	HGW HG517	24226045	○
30	33	31	5,5	5,6	1,5	HGW HG517	24226046	●
32	35	33	5,5	5,6	1,5	HGW HG517	24226047	○
32	37	33	9,6	9,7	1,5	HGW HG517	24306287	○
35	38	36	5,5	5,6	1,5	HGW HG517	24226048	○
36	39	37	5,5	5,6	1,5	HGW HG517	24226049	○
36	41	37,6	9,6	9,7	2,5	HGW HG517	24131021	●
38	41	39	5,5	5,6	1,5	HGW HG517	24226050	○
40	43	41	5,5	5,6	1,5	HGW HG517	24226052	●
40	45	41,6	9,6	9,7	1,5	HGW HG517	24131024	●
42	47	43	5,5	5,6	1,5	HGW HG517	24131026	○
45	50	46,6	5,5	5,6	2,5	HGW HG517	24131029	●
45	50	46,6	9,6	9,7	1,5	HGW HG517	24131030	●
50	55	51,6	5,5	5,6	2,5	HGW HG517	24131032	○
50	55	51,6	9,6	9,7	2,5	HGW HG517	24131033	●
50	55	51,6	14,8	15	2,5	HGW HG517	24237133	○
55	60	56,6	9,6	9,7	2,5	HGW HG517	24131036	●
55	60	56,6	14,8	15	2,5	HGW HG517	24275189	○
56	61	57,6	5,5	5,6	2,5	HGW HG517	24131038	○
56	61	57,6	9,6	9,7	2,5	HGW HG517	24131039	○
56	61	57,6	14,8	15	2,5	HGW HG517	24290092	○
60	65	61,6	5,5	5,6	2,5	HGW HG517	24131041	○
60	65	61,6	9,6	9,7	2,5	HGW HG517	24131042	○
60	65	61,6	14,8	15	2,5	HGW HG517	24194850	○
60	65	61,6	19,8	20	2,5	HGW HG517	24237268	○
63	68	64,6	9,6	9,7	2,5	HGW HG517	24131045	○
65	70	66,6	9,6	9,7	2,5	HGW HG517	24131048	●
65	70	66,6	14,8	15	2,5	HGW HG517	24341762	○
70	75	71,6	9,6	9,7	2,5	HGW HG517	24131051	●
70	75	71,6	14,8	15	2,5	HGW HG517	24180724	○
75	80	76,6	9,6	9,7	2,5	HGW HG517	24131054	●
75	80	76,6	14,8	15	2,5	HGW HG517	24351115	○
80	85	81,6	9,6	9,7	2,5	HGW HG517	24131056	●

● Available from stock ○ On request: Tool is available, delivery at short notice

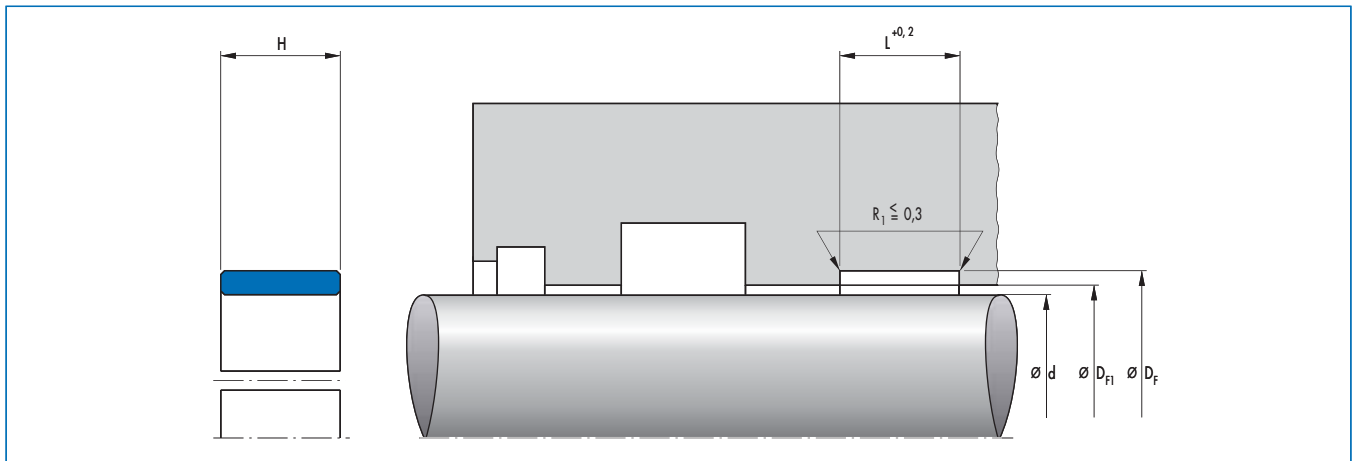


d	D _F	D ₁	H	L	Profile	Material	Article No.	
80	85	81,6	14,8	15	2,5	HGW HG517	24138557	○
80	85	81,6	24,5	25	2,5	HGW HG517	24345442	○
85	90	86,6	9,6	9,7	2,5	HGW HG517	24131058	●
85	90	86,6	14,8	15	2,5	HGW HG517	24346624	●
90	95	91,6	9,6	9,7	2,5	HGW HG517	24131060	●
90	95	91,6	14,8	15	2,5	HGW HG517	24232557	○
95	100	96,6	9,6	9,7	2,5	HGW HG517	24148244	●
100	105	101,6	9,6	9,7	2,5	HGW HG517	24131062	●
100	105	101,6	14,8	15	2,5	HGW HG517	24174684	●
100	105	101,6	24,5	25	2,5	HGW HG517	24294287	○
105	110	106,6	9,6	9,7	2,5	HGW HG517	24197459	○
105	110	106,6	14,8	15	2,5	HGW HG517	24191184	○
110	115	111,6	14,8	15	2,5	HGW HG517	24193285	○
110	115	111,6	24,5	25	2,5	HGW HG517	24306764	○
111,1	116,1	112,7	19,8	25	2,5	HGW HG517	24375990	○
115	120	116,6	24,5	25	2,5	HGW HG517	24311951	○
120	125	121,6	9,6	9,7	2,5	HGW HG517	24136649	●
120	125	121,6	14,8	15	2,5	HGW HG517	24174685	●
120	125	121,6	24,5	25	2,5	HGW HG517	24240122	○
125	130	126,6	9,6	9,7	2,5	HGW HG517	24131068	○
125	130	126,6	14,8	15	2,5	HGW HG517	24131069	○
130	135	131,6	14,8	15	2,5	HGW HG517	24172594	○
130	135	131,6	19,8	20	2,5	HGW HG517	24375478	○
140	145	141,6	9,6	9,7	2,5	HGW HG517	24131071	○
140	145	141,6	14,8	15	2,5	HGW HG517	24131072	○
140	145	141,6	24,5	25	2,5	HGW HG517	24143420	○
145	150	146,6	19,8	20	2,5	HGW HG517	24342271	○
145	150	146,6	24,5	25	2,5	HGW HG517	24349284	○
150	155	151,6	14,8	15	2,5	HGW HG517	24131075	○
160	165	161,6	14,8	15	2,5	HGW HG517	24131078	○
165	170	166,6	14,8	15	2,5	HGW HG517	24183087	○
170	175	171,6	14,8	15	2,5	HGW HG517	24190517	○
170	175	171,6	24,5	25	2,5	HGW HG517	24375858	○
180	185	181,6	14,8	15	2,5	HGW HG517	24131081	●
180	188	182,5	24,5	25	4	HGW HG517	24354370	○
190	195	191,6	14,8	15	2,5	HGW HG517	24216375	○
190	195	191,6	24,5	25	2,5	HGW HG517	24262387	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D _F	D ₁	H	L	Profile	Material	Article No.	
200	205	201,6	14,8	15	2,5	HGW HG517	24131084	○
200	208	202,5	24,5	25	4	HGW HG517	24227974	○
210	215	211,6	14,8	15	2,5	HGW HG517	24226067	●
210	218	212,5	24,5	25	4	HGW HG517	24263732	○
220	225	221,6	14,8	15	2,5	HGW HG517	24209167	○
230	235	231,6	14,8	15	2,5	HGW HG517	24226069	○
230	235	231,6	19,8	20	2,5	HGW HG517	24342273	○
240	245	241,6	14,8	15	2,5	HGW HG517	24197575	○
240	245	241,6	24,5	25	2,5	HGW HG517	24354796	○
240	248	242,5	24,5	25	4	HGW HG517	24262692	○
250	255	251,6	14,8	15	2,5	HGW HG517	24226070	○
260	265	261,6	14,8	15	2,5	HGW HG517	24226071	○
280	285	281,6	14,8	15	2,5	HGW HG517	24226073	○
280	285	281,6	24,5	25	2,5	HGW HG517	24351791	○
280	288	282,5	24,5	25	4	HGW HG517	24353315	○
300	305	301,6	14,8	15	2,5	HGW HG517	24191327	○
300	305	301,6	24,5	25	2,5	HGW HG600	24334866	○
300	308	302,5	24,5	25	4	HGW HG600	24256760	○
310	315	311,6	14,8	15	2,5	HGW HG600	24226075	○
310	315	311,6	24,5	25	2,5	HGW HG600	24343892	○
310	318	312,5	24,5	25	4	HGW HG600	24294293	○
316,2	321,2	317,8	24,5	25	2,5	HGW HG600	49044808	○
320	325	321,6	14,8	15	2,5	HGW HG600	24226076	○
320	325	321,6	24,5	25	2,5	HGW HG600	24226077	○
320	328	322,5	24,5	25	4	HGW HG600	24308092	○
330	335	331,6	14,8	15	2,5	HGW HG600	24226078	○
330	335	331,6	24,5	25	2,5	HGW HG600	24187413	○
340	345	341,6	14,8	15	2,5	HGW HG600	24226079	○
340	345	341,6	24,5	25	2,5	HGW HG600	24226080	○
350	355	351,6	14,8	15	2,5	HGW HG600	24226081	○
350	355	351,6	24,5	25	2,5	HGW HG600	24226082	○
350	358	352,5	24,5	25	4	HGW HG600	24337997	○
360	365	361,6	14,8	15	2,5	HGW HG600	24226083	○
360	365	361,6	24,5	25	2,5	HGW HG600	24226084	○
360	368	362,5	24,5	25	4	HGW HG600	24342012	○
370	375	371,6	24,5	25	2,5	HGW HG600	24327519	○
380	385	381,6	14,8	15	2,5	HGW HG600	24353459	○
380	385	381,6	24,5	25	2,5	HGW HG600	24250195	○
390	395	391,6	14,8	15	2,5	HGW HG600	24375951	○
390	395	391,6	24,5	25	2,5	HGW HG600	24187414	○
390	398	392,5	24,5	25	4	HGW HG600	24307327	○
400	405	401,6	14,8	15	2,5	HGW HG600	24345757	○
400	405	401,6	24,5	25	2,5	HGW HG600	24333824	○
400	408	402,5	24,5	25	4	HGW HG600	24259182	○
406,4	414,4	408,9	24,5	25	4	HGW HG600	24361390	○
410	415	411,6	14,8	15	2,5	HGW HG600	24288046	○
410	415	411,6	24,5	25	2,5	HGW HG600	24294216	○
420	425	421,6	14,8	15	2,5	HGW HG600	24356361	○
420	425	421,6	24,5	25	2,5	HGW HG600	24329919	○
420	428	422,5	24,5	25	4	HGW HG600	24346468	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D _F	D ₁	H	L	Profile	Material	Article No.	
440	448	442,5	24,5	25	4	HGW HG600	24363242	○
450	455	451,6	14,8	15	2,5	HGW HG600	24265877	○
450	455	451,6	24,5	25	2,5	HGW HG600	24339926	○
450	458	452,5	24,5	25	4	HGW HG600	24294987	○
457,2	465,2	459,7	24,5	25	4	HGW HG600	24367537	○
460	465	461,6	14,8	15	2,5	HGW HG600	24356363	○
460	465	461,6	24,5	25	2,5	HGW HG600	24339221	○
460	468	462,5	24,5	25	4	HGW HG600	24269407	○
463,6	471,6	466,1	24,5	25	4	HGW HG600	24361809	○
470	475	471,6	14,8	15	2,5	HGW HG600	24327589	○
470	475	471,6	24,5	25	2,5	HGW HG600	24359238	○
475	483	477,5	24,5	25	4	HGW HG600	24334724	○
480	485	481,6	24,5	25	2,5	HGW HG600	24339373	○
480	488	482,5	24,5	25	4	HGW HG600	24291803	○
490	498	492,5	24,5	25	4	HGW HG600	24290172	○
500	505	501,6	14,8	15	2,5	HGW HG600	24356362	○
500	505	501,6	24,5	25	2,5	HGW HG600	24269675	○
500	508	502,5	24,5	25	4	HGW HG600	24269421	○
508	516	510,5	24,5	25	4	HGW HG600	24346656	○
510	518	512,5	24,5	25	4	HGW HG600	24299556	○
520	525	521,6	24,5	25	2,5	HGW HG600	24345682	○
520	528	522,5	24,5	25	4	HGW HG600	24329460	○
530	535	531,6	14,8	15	2,5	HGW HG600	24356360	○
530	538	532,5	24,5	25	4	HGW HG600	24363243	○
535	540	536,6	9,6	9,7	2,5	HGW HG600	24351386	○
540	548	542,5	24,5	25	4	HGW HG600	24274965	○
550	555	551,6	24,5	25	2,5	HGW HG600	24362838	○
558,8	566,8	561,3	24,5	25	4	HGW HG600	24361615	○
560	568	562,5	24,5	25	4	HGW HG600	24275169	○
570	575	571,6	24,5	25	2,5	HGW HG600	24250196	○
570	578	572,5	24,5	25	4	HGW HG600	24315103	○
580	588	582,5	24,5	25	4	HGW HG600	24307424	○
590	595	591,6	24,5	25	2,5	HGW HG600	24316066	○
590	598	592,5	24,5	25	4	HGW HG600	24288148	○
600	605	601,6	24,5	25	2,5	HGW HG600	24337098	○
600	608	602,5	24,5	25	4	HGW HG600	24340044	○
630	638	632,5	24,5	25	4	HGW HG600	24308091	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D _F	D ₁	H	L	Profile	Material	Article No.	
640	648	642,5	24,5	25	4	HGW HG600	24298435	○
650	655	651,6	14,8	15	2,5	HGW HG600	24302588	○
650	655	651,6	24,5	25	2,5	HGW HG600	24302589	○
650	658	652,5	24,5	25	4	HGW HG600	24293966	○
660	665	661,6	24,5	25	2,5	HGW HG600	24336388	○
670	675	671,6	24,5	25	2,5	HGW HG600	24353636	○
670	678	672,5	24,5	25	4	HGW HG600	24300401	○
680	688	682,5	24,5	25	4	HGW HG600	24269484	○
700	705	701,6	14,8	15	2,5	HGW HG600	24257373	○
710	715	711,6	24,5	25	2,5	HGW HG600	24359709	○
720	728	722,5	24,5	25	4	HGW HG600	24295834	○
730	735	731,6	24,5	25	2,5	HGW HG600	24362406	○
740	748	742,5	24,5	25	4	HGW HG600	24243177	○
749,5	757,5	752	24,5	25	4	HGW HG600	24367124	○
750	758	752,5	24,5	25	4	HGW HG600	24306400	○
787,4	795,4	789,9	24,5	25	4	HGW HG600	24331518	○
790	798	792,5	24,5	25	4	HGW HG600	24351818	○
800	808	802,5	24,5	25	4	HGW HG600	24295217	○
820	828	822,5	24,5	25	4	HGW HG600	24335809	○
830	838	832,5	24,5	25	4	HGW HG600	24339267	○
850	858	852,5	24,5	25	4	HGW HG600	24269891	○
860	868	862,5	24,5	25	4	HGW HG600	24294618	○
880	888	882,5	24,5	25	4	HGW HG600	24336302	○
890	898	892,5	14,8	15	4	HGW HG600	24297567	○
890	898	892,5	24,5	25	4	HGW HG600	24338494	○
900	908	902,5	24,5	25	4	HGW HG600	24257240	○
950	958	952,5	24,5	25	4	HGW HG600	24294142	○
970	978	972,5	24,5	25	4	HGW HG600	24359657	○
975	983	977,5	24,5	25	4	HGW HG600	24293718	○
1000	1005	1001,6	24,5	25	2,5	HGW HG600	24352886	○
1050	1058	1052,5	24,5	25	4	HGW HG600	24296553	○
1150	1158	1152,5	24,5	25	4	HGW HG600	24357301	○
1295,4	1303,4	1297,9	24,5	25	4	HGW HG600	24363063	○
1650	1658	1652,5	24,5	25	4	HGW HG600	24335492	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Guide Strip SF

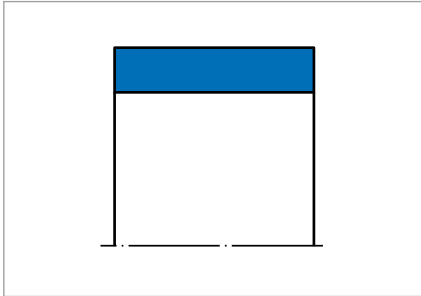


Fig. 1 Merkel Guide Strip SF

Product description

Non-metallic Merkel Guide Strip SF, available ready to fit cut to size or by the metre.

Product advantages

As a non-metallic guide element for rods, also for standardised housings according to ISO 10766

- Low friction, free of stick-slip.

Application

Control and regulation equipment, handling equipment, injection moulding machines.

Material

Material	Code
PTFE bronze compound	PTFE B500

Operating conditions

Material	PTFE B500
Temperature range in °C	
Hydraulic oils HL, HLP	-40 ... +200
HFA fluids	-
HFB fluids	-
HFC fluids	-
HFD fluids	-40 ... +200
Water	-
HETG (rapeseed oil)	-40 ... +80
HEES (synthetic esters)	-40 ... +100
HEPG (glycol)	-40 ... +80
Mineral greases	-40 ... +200

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤2 µm	≤10,0 µm
Side of groove	≤3 µm	≤15,0 µm

Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Calculating straight length L2

L2	Production tolerances
>20 ... 80	... 0,5
>80 ... 250	... 1,0
>250 ... 500	... 1,5
>500 ... 1000	... 2,0
>1000 ... 2000	... 3,0
>2000 ... 4000	... 4,0

Tolerance recommendation

D₁
H8

The tolerance definition for the dimensions D and d_F must be viewed in connection with the seal used. The diameter d₁ specified in the table of dimensions is to be viewed exclusively in relation to the guide ring. The corresponding diameter of an adjacent seal housing should be tailored to the sealing component.

Manufacturing tolerance

Production tolerance profile thickness S
-0,05

Surface load

p < 15 N/mm ² up to 20 °C
p < 7,5 N/mm ² up to 80 °C
p < 5 N/mm ² up to 120 °C

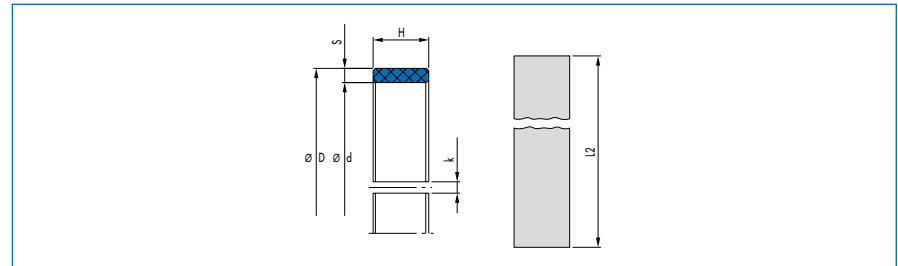
For running speed, see sealing system.

Cutting rolls to size

The following dimensions are available from stock by the metre. The straight length L2 of blanks is to be determined using the formula. The gap k produced after fitting is necessary due to thermal expansion. We recommend a straight cut on the strips. In the event of butt joints the tips may be damaged and break-off. Our cutter (Article No. 507228) facilitates time-saving and accurate cutting to size.

Calculation of the straight length L2 for rods:

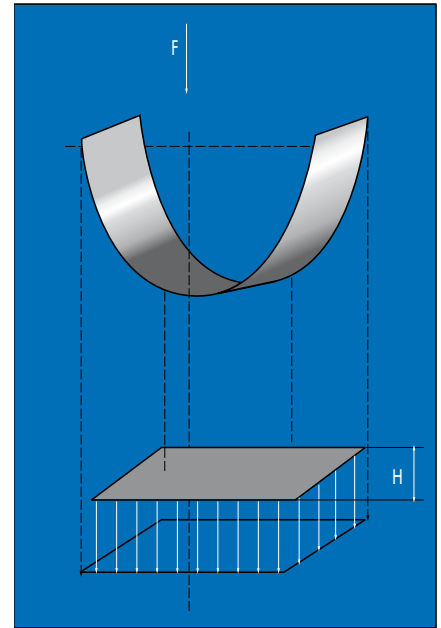
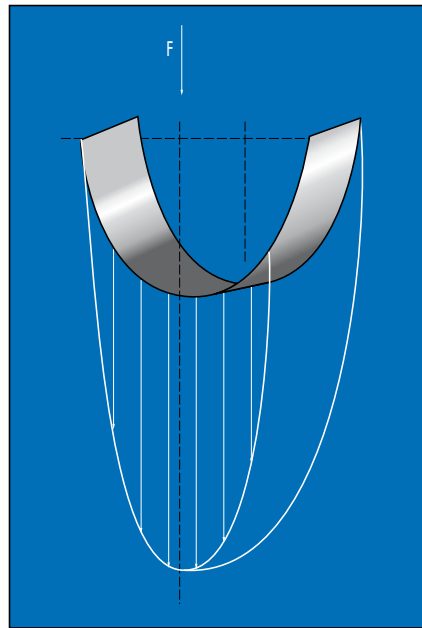
$$L2 = (d + S) \times 3,11 - 0,5$$



Groove length L	Profile thickness S	Article No.
8	2,5	24226174
9,7	2,5	24102775
10	2,5	24102563
12	2,5	24099191
15	2,5	24102564
20	2,5	24076217
25	2,5	24107955
15	4,0	24160019
20	4,0	24238052
25	4,0	24148093

Surface force

The pressure distribution on the guide rings is non-linear. The non-linear pressure curve over the contact range was taken into account when calculating the permissible specific surface pressure. The permissible load on the guide strip is calculated by multiplying the projected surface with the permissible specific surface pressure. However, the figure for the permissible specific surface pressure takes into account the possible angular offset of the rods when the recommended guide elements are used.



$$F = P \times A$$

$$H = F / (d \times P)$$

H = guide strip width [mm]

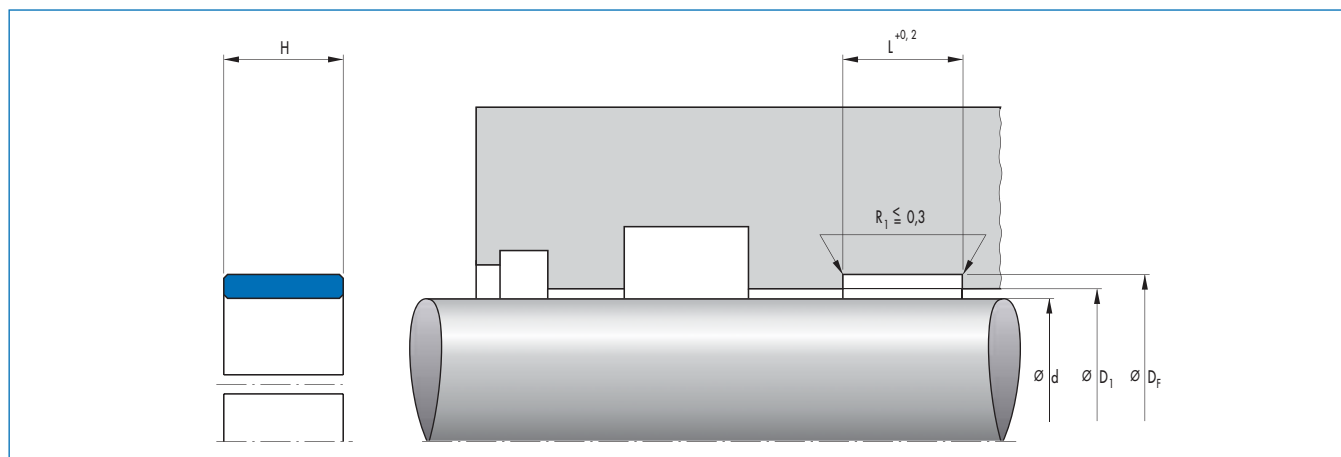
F = radial loading [N]

A = projected area [mm²]

P = perm. compression per unit area [N/mm²]

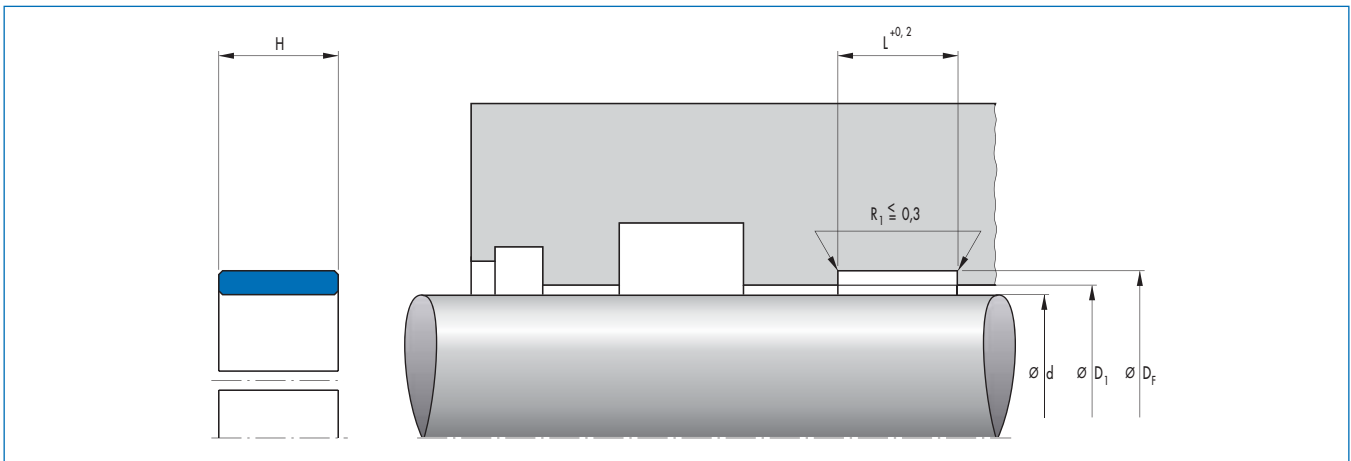
d = rod diameter with rod guidance;
piston diameter with
piston guidance [mm].

Article list



d	D _f	D ₁	H	L	Profile	Material	Article No.	
25	28	25,8	5,5	5,6	1,5	PTFE B500	24300101	●
28	31	28,8	5,5	5,6	1,5	PTFE B500	24300102	○
32	37	32,8	9,6	9,7	2,5	PTFE B500	24294062	○
35	38	35,8	5,5	5,6	1,5	PTFE B500	24300105	○
36	41	36,8	5,5	5,6	2,5	PTFE B500	24165260	○
40	45	40,8	9,6	9,7	2,5	PTFE B500	24216883	○
42	47	43,2	5,5	5,6	2,5	PTFE B500	24300109	○
44	49	45,2	9,6	9,7	2,5	PTFE B500	24333828	○
45	50	46,2	5,5	5,6	2,5	PTFE B500	24300110	●
45	50	46,2	9,6	9,7	2,5	PTFE B500	24266350	○
45	50	46,6	14,8	15	2,5	PTFE B500	24311361	○
50	55	51,2	5,5	5,6	2,5	PTFE B500	24110082	●
50	55	51,2	9,6	9,7	2,5	PTFE B500	24169558	●
50	55	51,6	14,8	15	2,5	PTFE B500	24203345	○
55	60	56,2	9,6	9,7	2,5	PTFE B500	24160646	●
55	60	56,6	14,8	15	2,5	PTFE B500	24275190	○
56	61	57,2	5,5	5,6	2,5	PTFE B500	24300111	○
56	61	57,2	9,6	9,7	2,5	PTFE B500	24245671	●
56	61	57,6	14,8	15	2,5	PTFE B500	24316593	○
58	63	59,2	9,6	9,7	2,5	PTFE B500	24333829	○
60	65	61,2	9,6	9,7	2,5	PTFE B500	24165598	●
60	65	61,6	14,8	15	2,5	PTFE B500	24203612	○
63	68	64,2	9,6	9,7	2,5	PTFE B500	24300114	●
63	68	64,6	14,8	15	2,5	PTFE B500	24275191	○
65	70	66,2	9,6	9,7	2,5	PTFE B500	24300116	●
68	73	69,2	9,6	9,7	2,5	PTFE B500	24332153	○
70	75	71,2	9,6	9,7	2,5	PTFE B500	24300118	●
75	80	76,2	9,6	9,7	2,5	PTFE B500	24300120	●
75	80	76,6	14,8	15	2,5	PTFE B500	24244742	○
80	85	81,2	9,6	9,7	2,5	PTFE B500	24300122	●
80	85	81,6	14,8	15	2,5	PTFE B500	24266958	○
80	85	81,6	24,5	25	2,5	PTFE B500	24265250	○
85	90	86,2	9,6	9,7	2,5	PTFE B500	24167352	●
85	90	86,6	14,8	15	2,5	PTFE B500	24244741	○
90	95	91,2	9,6	9,7	2,5	PTFE B500	24300125	●
90	95	91,6	14,8	15	2,5	PTFE B500	24291194	○

● Available from stock ○ On request: Tool is available, delivery at short notice

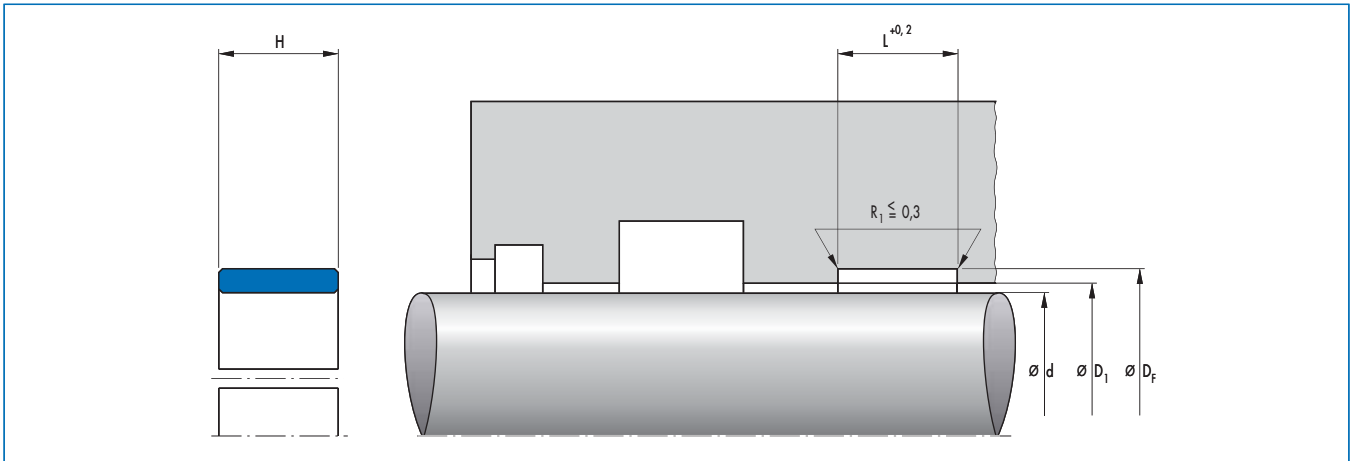


d	D _f	D ₁	H	L	Profile	Material	Article No.	
95	100	96,2	9,6	9,7	2,5	PTFE B500	24300127	○
100	105	101,2	9,6	9,7	2,5	PTFE B500	24300129	●
100	105	101,6	14,8	15	2,5	PTFE B500	24250627	●
100	105	101,6	19,5	20	2,5	PTFE B500	24260605	○
100	105	101,6	24,5	25	2,5	PTFE B500	24342265	○
100	108	102,5	14,8	15	4	PTFE B500	24327233	○
105	110	106,2	9,6	9,7	2,5	PTFE B500	24300131	○
110	115	111,2	9,6	9,7	2,5	PTFE B500	24300133	●
110	115	111,6	14,8	15	2,5	PTFE B500	24293684	○
110	115	111,6	19,5	20	2,5	PTFE B500	24166931	○
110	115	111,6	24,5	25	2,5	PTFE B500	24292915	○
110	118	112,5	14,8	15	4	PTFE B500	24327234	○
115	120	116,2	9,6	9,7	2,5	PTFE B500	24300135	○
115	120	116,6	19,5	20	2,5	PTFE B500	24242172	○
120	125	121,2	9,6	9,7	2,5	PTFE B500	24300137	○
120	125	121,6	14,8	15	2,5	PTFE B500	24300138	○
125	130	126,2	9,6	9,7	2,5	PTFE B500	24300140	●
125	130	126,6	14,8	15	2,5	PTFE B500	24300141	●
125	130	126,6	19,5	20	2,5	PTFE B500	24230162	○
130	135	131,2	9,6	9,7	2,5	PTFE B500	24300143	○
130	135	131,6	14,8	15	2,5	PTFE B500	24300144	○
130	135	131,6	24,5	25	2,5	PTFE B500	24262562	○
135	140	136,2	9,6	9,7	2,5	PTFE B500	24300146	○
140	145	141,6	14,8	15	2,5	PTFE B500	24300149	○
140	145	141,6	19,5	20	2,5	PTFE B500	24328413	○
140	145	141,6	24,5	25	2,5	PTFE B500	24256885	○
140	148	142,5	14,8	15	4	PTFE B500	24327236	○
145	150	146,2	9,6	9,7	2,5	PTFE B500	24248043	○
150	155	151,6	14,8	15	2,5	PTFE B500	24300151	●
150	155	151,6	19,5	20	2,5	PTFE B500	24203276	○
150	155	151,6	24,5	25	2,5	PTFE B500	24168884	○
160	165	161,2	9,6	9,7	2,5	PTFE B500	24204644	○
160	165	161,6	14,8	15	2,5	PTFE B500	24204055	○
160	165	161,6	24,5	25	2,5	PTFE B500	24263903	○
170	175	171,6	14,8	15	2,5	PTFE B500	24300153	●
175	180	176,6	24,5	25	2,5	PTFE B500	24264758	○
180	185	181,2	9,6	9,7	2,5	PTFE B500	24300154	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D _F	D ₁	H	L	Profile	Material	Article No.	
180	185	181,6	14,8	15	2,5	PTFE B500	24300155	●
185	190	186,2	9,6	9,7	2,5	PTFE B500	24291724	○
190	195	191,6	14,8	15	2,5	PTFE B500	24300157	○
195	200	196,2	9,6	9,7	2,5	PTFE B500	24242182	○
200	205	201,6	14,8	15	2,5	PTFE B500	24154721	○
200	205	201,6	24,5	25	2,5	PTFE B500	24266925	○
200	208	202,5	24,5	25	4	PTFE B500	24299021	○
210	215	211,2	9,6	9,7	2,5	PTFE B500	24300159	○
210	215	211,6	14,8	15	2,5	PTFE B500	24300160	●
210	215	211,6	19,5	20	2,5	PTFE B500	24239042	○
220	225	221,2	9,6	9,7	2,5	PTFE B500	24300161	○
220	225	221,6	14,8	15	2,5	PTFE B500	24300162	○
220	225	221,6	19,5	20	2,5	PTFE B500	24157304	○
230	235	231,6	14,8	15	2,5	PTFE B500	24154716	○
230	235	231,6	19,5	20	2,5	PTFE B500	24342108	○
240	245	241,2	9,6	9,7	2,5	PTFE B500	24258216	○
240	245	241,6	14,8	15	2,5	PTFE B500	24223045	○
240	245	241,6	24,5	25	2,5	PTFE B500	24314554	○
245	250	246,6	24,5	25	2,5	PTFE B500	24311377	○
250	255	251,6	14,8	15	2,5	PTFE B500	24300163	○
260	265	261,6	14,8	15	2,5	PTFE B500	24300164	○
270	275	271,6	24,5	25	2,5	PTFE B500	24262561	○
280	285	281,6	14,8	15	2,5	PTFE B500	24300166	○
290	295	291,6	14,8	15	2,5	PTFE B500	24300167	○
300	305	301,6	14,8	15	2,5	PTFE B500	24300168	○
300	305	301,6	24,5	25	2,5	PTFE B500	24348072	○
310	315	311,6	14,8	15	2,5	PTFE B500	24300169	○
325	330	326,6	24,5	25	2,5	PTFE B500	24293821	○
330	335	331,6	14,8	15	2,5	PTFE B500	24300172	○
330	335	331,6	24,5	25	2,5	PTFE B500	24300173	○
340	345	341,6	14,8	15	2,5	PTFE B500	24300174	○
340	345	341,6	24,5	25	2,5	PTFE B500	24162997	○
343	348	344,6	14,8	15	2,5	PTFE B500	24301095	○
350	355	351,6	14,8	15	2,5	PTFE B500	24300175	○
350	355	351,6	24,5	25	2,5	PTFE B500	24300176	○
350	358	352,5	24,5	25	4	PTFE B500	24337998	○
360	365	361,6	14,8	15	2,5	PTFE B500	24300177	○
360	368	362,5	24,5	25	4	PTFE B500	24342011	○
390	395	391,6	14,8	15	2,5	PTFE B500	24350238	○
390	395	391,6	24,5	25	2,5	PTFE B500	24336658	○
390	398	392,5	24,5	25	4	PTFE B500	24355839	○
400	405	401,6	14,8	15	2,5	PTFE B500	24274959	○
400	408	402,5	24,5	25	4	PTFE B500	24269425	○
410	415	411,6	14,8	15	2,5	PTFE B500	49045103	○
410	415	411,6	24,5	25	2,5	PTFE B500	24296901	○
420	425	421,6	19,5	20	2,5	PTFE B500	24230161	○
420	425	421,6	24,5	25	2,5	PTFE B500	24233817	○
420	428	422,5	24,5	25	4	PTFE B500	24269684	○
425	430	426,6	24,5	25	2,5	PTFE B500	24261535	○
430	435	431,6	19,5	20	2,5	PTFE B500	24203171	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D _F	D ₁	H	L	Profile	Material	Article No.	
430	435	431,6	24,5	25	2,5	PTFE B500	24348071	○
431,8	439,8	434,3	24,5	25	4	PTFE B500	24362369	○
435	440	436,6	24,5	25	2,5	PTFE B500	24162988	○
440	445	441,6	24,5	25	2,5	PTFE B500	24344261	○
450	455	451,6	14,8	15	2,5	PTFE B500	24265878	○
450	455	451,6	24,5	25	2,5	PTFE B500	24257338	○
450	458	452,5	24,5	25	4	PTFE B500	24294991	○
460	465	461,6	24,5	25	2,5	PTFE B500	24308715	○
460	468	462,5	24,5	25	4	PTFE B500	24269409	○
463,6	471,6	466,1	24,5	25	4	PTFE B500	24361808	○
470	475	471,6	24,5	25	2,5	PTFE B500	24347036	○
470	478	472,5	24,5	25	4	PTFE B500	24274936	○
475	480	476,6	24,5	25	2,5	PTFE B500	24261562	○
480	485	481,6	24,5	25	2,5	PTFE B500	24261536	○
480	488	482,5	24,5	25	4	PTFE B500	24337938	○
490	495	491,6	14,8	15	2,5	PTFE B500	24366903	○
500	505	501,6	14,8	15	2,5	PTFE B500	24264832	○
500	505	501,6	24,5	25	2,5	PTFE B500	24263467	○
500	508	502,5	19,5	20	4	PTFE B500	24360925	○
500	508	502,5	24,5	25	4	PTFE B500	24269420	○
510	515	511,6	24,5	25	2,5	PTFE B500	24269186	○
520	525	521,6	19,5	20	2,5	PTFE B500	24242786	○
540	545	541,6	24,5	25	2,5	PTFE B500	24358194	○
540	548	542,5	24,5	25	4	PTFE B500	24332687	○
550	555	551,6	24,5	25	2,5	PTFE B500	24344262	○
560	568	562,5	24,5	25	4	PTFE B500	24274998	○
570	575	571,5	24,5	25	2,5	PTFE B500	24263227	○
580	588	582,5	24,5	25	4	PTFE B500	24307426	○
590	595	591,6	24,5	25	2,5	PTFE B500	24290939	○
596,9	604,9	599,4	29,5	30	4	PTFE B500	24236371	○
600	605	601,6	14,8	15	2,5	PTFE B500	24316132	○
600	605	601,6	19,5	20	2,5	PTFE B500	24300403	○
600	608	602,5	24,5	25	4	PTFE B500	24354936	○
620	625	621,6	19,5	20	2,5	PTFE B500	24291416	○
620	625	621,6	24,5	25	2,5	PTFE B500	24354129	○
630	635	631,6	19,5	20	2,5	PTFE B500	24361332	○
630	635	631,6	24,5	25	2,5	PTFE B500	24263904	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D _F	D ₁	H	L	Profile	Material	Article No.	
640	648	642,5	24,5	25	4	PTFE B500	24298429	○
650	658	652,5	24,5	25	4	PTFE B500	24293967	○
670	675	671,6	24,5	25	2,5	PTFE B500	24162996	○
670	678	672,5	24,5	25	4	PTFE B500	24361116	○
675	680	676,6	24,5	25	2,5	PTFE B500	24261537	○
700	705	701,6	14,8	15	2,5	PTFE B500	24234909	○
700	705	701,6	24,5	25	2,5	PTFE B500	24223046	○
700	708	702,5	29,5	30	4	PTFE B500	24262945	○
710	718	712,5	14,8	15	4	PTFE B500	24216172	○
720	728	722,5	24,5	25	4	PTFE B500	24359660	○
723,9	731,9	726,4	19,5	20	4	PTFE B500	24249366	○
730	738	732,5	24,5	25	4	PTFE B500	24263632	○
735	740	736,6	24,5	25	2,5	PTFE B500	24163718	○
740	748	742,5	19,5	20	4	PTFE B500	24344397	○
740	748	742,5	24,5	25	4	PTFE B500	24243175	○
750	755	751,6	24,5	25	2,5	PTFE B500	24227972	○
787,4	795,4	789,9	24,5	25	4	PTFE B500	24331521	○
790	798	792,5	24,5	25	4	PTFE B500	24351827	○
800	805	801,6	24,5	25	2,5	PTFE B500	24162994	○
800	808	802,5	24,5	25	4	PTFE B500	24295216	○
820	828	822,5	19,5	20	4	PTFE B500	24238051	○
830	838	832,5	24,5	25	4	PTFE B500	24344381	○
850	858	852,5	24,5	25	4	PTFE B500	24314615	○
890	898	892,5	14,8	15	4	PTFE B500	24263607	○
890	898	892,5	24,5	25	4	PTFE B500	24263885	○
900	908	902,5	24,5	25	4	PTFE B500	24257241	○
950	958	952,5	24,5	25	4	PTFE B500	24233242	○
975	983	977,5	24,5	25	4	PTFE B500	24361413	○
1050,00	1058,00	1052,50	24,5	25	4	PTFE B500	24296554	○
1150,00	1158,00	1152,50	24,5	25	4	PTFE B500	24357284	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Profiles for Oscillating Applications

Product overview

- Profiles
 - U-rings
 - Mating rings for U-rings
 - Other special profiles
- Cords
 - Cord
 - Cord rings.

Product description

Special profiles or cords are utilised whenever large sealing contact areas cannot be effectively sealed by form seals or O-rings, for example, in tunnelling machines, ships engines and hatchways. Over 3500 different profile nozzles as well as numerous materials area available. In addition, the development and production of customer-specific designs is possible, where the tool costs are very low compared to shape related components.

Product advantages

- Sealing large seal contact areas that cannot be sealed by an O-ring or a shape related component
- Customer-specific product development
- Low tool costs in comparison to shape related components
- Proprietary tool construction to ensure short supply times
- All common elastomers can be utilised
- Special materials competency
- Low number of pieces/amounts possible
- Profile rings in NBR and FKM are available with vulcanisation to butt. Advantages of batch vulcanisation:
 - Peak tensile strength values
 - Identical elastomer as connecting element provides long-lasting durability.

Application

Components manufactured from profiles perform sealing tasks in numerous industrial sectors.

- Heavy-duty mechanical engineering, e.g. tunnel driving technology, cement/rock mills
- Plant engineering, e.g. turbines, shut-off valves, process cylinders
- Prime movers, e.g. ships' engines
- Separators, e.g. filtering technology, large separators
- Mechanical engineering, e.g. industrial washing machines, rotating assemblies

- Chemical industry, e.g. bins/reaction vessels, dosing units/dosing pumps
- Medical technology, e.g. diagnostic equipment components, dosing units
- Foodstuffs industry, e.g. industrial juice presses, separators, and butchering machines.

Material

Besides the common materials with shorter delivery times, numerous special materials are also offered. These feature outstanding quality and durability. In

the following overview, suitable materials can be selected according to their requirements.

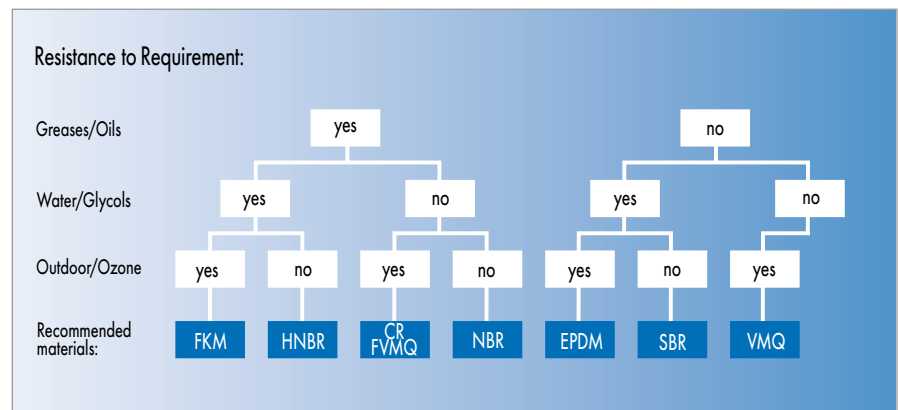


Fig.1 Material configuration

Material	Colour	Operating temperature range
50 NBR 121*	Black	-30 ... +90 °C
60 NBR 122	Black	-30 ... +90 °C
70 NBR 221	Black	-25 ... +90 °C
70 NBR 803	Grey	-25 ... +90 °C
70 NBR 173216	Black	-30 ... +70 °C
72 NBR 872	Black	-30 ... +100 °C
79 NBR 105	Black	-30 ... +90 °C
80 NBR 709*	Black	-30 ... +90 °C
85 NBR 714	Black	-20 ... +90 °C
88 NBR 101	Black	-30 ... +100 °C
39 CR 174240*	Grey	-40 ... +80 °C
55 CR 852	Black	-40 ... +110 °C
67 CR 853	Black	-40 ... +110 °C
67 CR 215595	Black	-40 ... +80 °C
58 EPDM 215550	Grey	-40 °C ... +120 °C
70 EPDM 275	Black	-40 °C ... +120 °C
70 FKM 598	Green	-15 °C ... +200 °C
70 FKM 215450	Black	-10 °C ... +200 °C
72 FKM 588	Black	-10 °C ... +200 °C
60 FVMQ 143026	Beige	-80 °C ... +175 °C
50 VMQ 570	Beige	-40 °C ... +200 °C
50 VMQ 114721	Yellow transparent	-40 °C ... +180 °C
58 VMQ 518	Red brown	-40 °C ... +200 °C
60 VMQ 114722	Yellow transparent	-40 °C ... +180 °C
70 VMQ 114723	Yellow transparent	-40 °C ... +180 °C
78 VMQ 526	Red	-40 °C ... +200 °C

* Special material on enquiry

Design notes

Tolerances

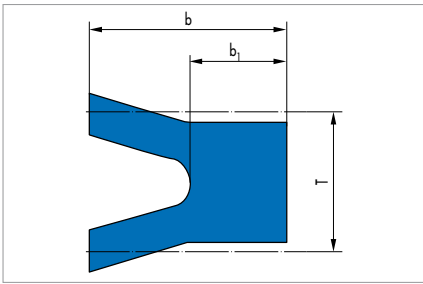
All profiles and cords are manufactured according to DIN ISO 3302-1 E2. In exceptional cases, production to E1 is also possible.

Limits for dimensions of cross sections of extruded components not supported (all dimensions in mm):

Nominal dimension		Tolerance class	
over	to	E1*	E2
0	1,5	0,15	0,25
1,5	2,5	0,20	0,35
2,5	4,0	0,25	0,40
4,0	6,3	0,35	0,50
6,3	10,0	0,40	0,70
10	16	0,50	0,80
16	25	0,70	1,00
25	40	0,80	1,30
40	63	1,00	1,60
63	100	1,30	2,00

* Partially possible in individual cases

U-rings

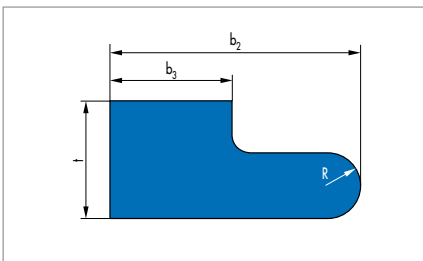


U-rings are produced, extruded and bonded to the butt for use as piston or rod seals. U-rings made of NBR and FKM are also available with vulcanisation to butt. They can be supplied at extremely short notice.

Fitting & installation

The inner diameter of the U-ring should be at least 15 times the profile cross section dimension (T).

Mating rings for U-rings



Mating rings are used for fastening and prevent axial movement of the U-rings, which can damage the sealing edges at the sealing lips. They are manufactured using extruders. The mating rings are always supplied by the metre.

Fitting Notes

During fitting, the two ends are placed flush to one another. The mating rings can be seated on the U-rings with a slight axial tension.

Operating conditions

Operating pressure: <= 10 bar

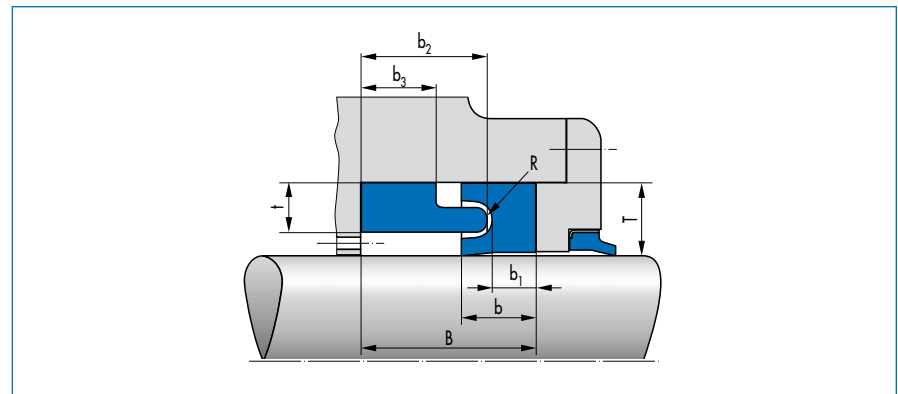
Running speed: <0,5 m/s.

Article list

T	b	b1	Article No.
4	8	5	DÜ 115
6	6	3	DÜ 206
6	8	5	DÜ 859
10	10	4	DÜ 175
12	12	6	DÜ 619
15	15	7,5	DÜ 155
15	18	9	DÜ 1045
20	20	10	DÜ 141
25	25	12,5	DÜ 111
30	30	15	DÜ 241

Other dimensions on enquiry.

Article list



U-ring			Mating ring				Article No.	B
T	b	b1	T	b2	b3	R		
10	10	4,0	6,5	20	10	1,5	DÜ 287	25
15	15	17,5	11	32	18	3	DÜ 188	39,5
20	20	10	14	30	15	4	DÜ 160	40

Other dimensions on enquiry.

Other special profiles

Profiles can be produced and supplied as follows:

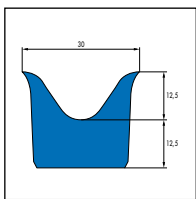
- By the metre
 - With/without integral bend
- Profile sections
 - Produced to customer requirements (up to 2000 mm without integral bend possible)
- Profile rings
 - Bonded to butt or batch vulcanised.

Profile nozzles

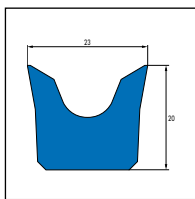
Below is a selection of the 3500 profile nozzles in stock.

Individual tools can be developed and produced for special designs on enquiry.

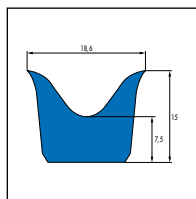
This normally takes around 4 weeks.



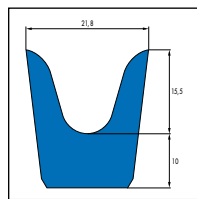
Profile 111



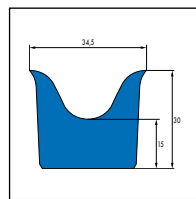
Profile 141



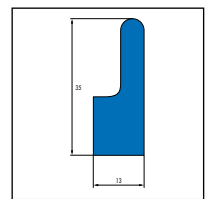
Profile 155



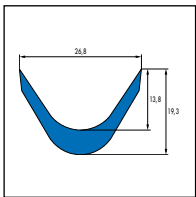
Profile 216



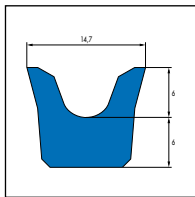
Profile 241



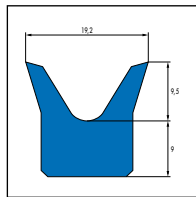
Profile 272



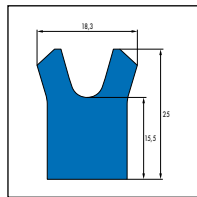
Profile 441



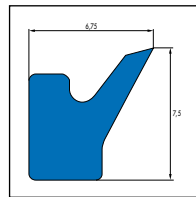
Profile 619



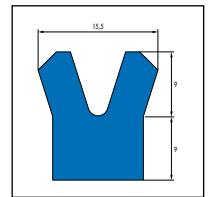
Profile 1045



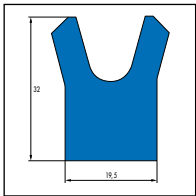
Profile 1673



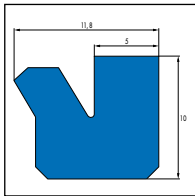
Profile 1677



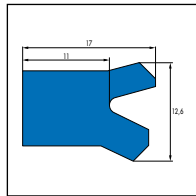
Profile 1721



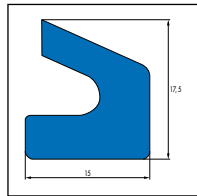
Profile 1749



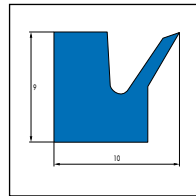
Profile 2754



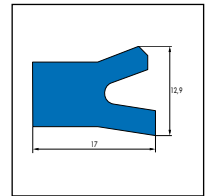
Profile 2777



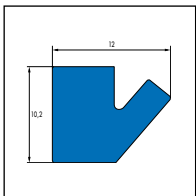
Profile 2858



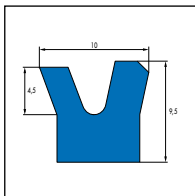
Profile 2995



Profile 3300



Profile 20160



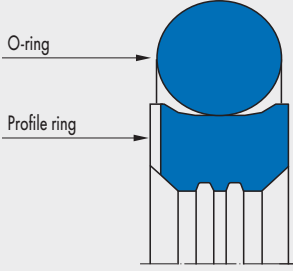
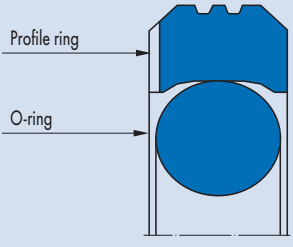
Profile 20218

Pre-Selection Hydraulics – Other Seals

Temperature figures refer to mineral oils. Due to the large choice of media with different and varying additives, which is not always easily comprehensible, the above operating limits are only recommended values. We recommend testing resistance in the specific case.

Individual instances of the operating limits stated may be exceeded taking into account the related operating conditions. With a long duty cycle, stop-start operation or other difficult operating conditions it is recommended that these values are not simultaneously exploited to the full.

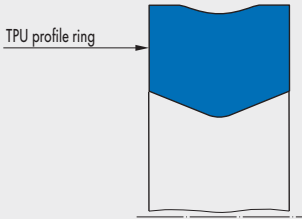
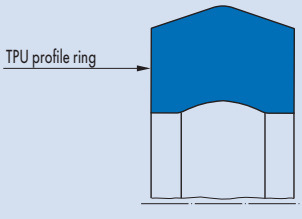
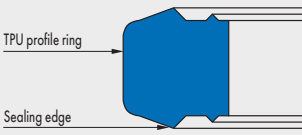
Seals for Swivelling Movement

Seal		Standard		
Type	Material	DIN/ISO	Examples of use	
<p>Merkel Rotomatic M 15</p> 	PTFE glass NBR		Compact, highly resistant to hydraulic fluids, low friction, free of stick-slip, suitable for pivoting motions.	
<p>Merkel Rotomatic M 16</p> 	PTFE glass NBR		Compact, highly resistant to hydraulic fluids, low friction, free of stick-slip, suitable for pivoting motions.	

● = very good; ◐ = good; ○ = possible or satisfactory; ⊗ = not suitable

	Function					Operating Limits		
	single-acting	double-acting	Individual seal	Primary seal	Secondary seal	Pressure (MPa)	Speed (m/s)	Temperature (°C)
						40	0,5	-30 ... +100
						40	0,5	-30 ... +100

Static Seals

Seal		Standard		
Type	Material	DIN/ISO	Examples of use	
<p>Merkel Cover Seal PU 82</p>  <p>TPU profile ring</p>	95 AU V142		Inner sealing, well suited for high pressure peaks, high gap bridging/ extrusion protection, replaces O-ring/ back ring variants.	
<p>Merkel Cover Seal PU 83</p>  <p>TPU profile ring</p>	95 AU V142		Outer sealing, well suited for high pressure peaks, high gap bridging/ extrusion protection, replaces O-ring/ back ring variants.	
<p>Merkel Stirromatic SRC</p>  <p>TPU profile ring</p> <p>Sealing edge</p>	95 AU V142		Very good extrusion resistance, suitable for extremely high, pulsating pressure peaks, low requirements on housings.	

● = very good; ◐ = good; ○ = possible or satisfactory; ⊗ = not suitable

	Function					Operating Limits		
	single-acting	double-acting	Individual seal	Primary seal	Secondary seal	Pressure (MPa)	Speed (m/s)	Temperature (°C)
						60		-30 ... +110
						60		-30 ... +110
						80		-30 ... +110

Merkel Rotomatic M 15

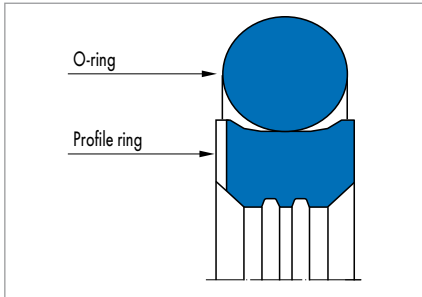


Fig. 1 Merkel Rotomatic M 15

Product description

Two-piece Merkel seal set for sealing piston rods, consisting of one PTFE profile ring and an O-ring as a pre-load component.

Product advantages

Double-acting rod seal for pivoting motions in hydraulic systems, preferably for usage in hydraulic joints and rotary joints.

- Short
- Highly resistant to hydraulic fluids
- Low friction, free of stick-slip.

Application

Excavators, grippers, rotary joints.

Material

PTFE profile ring

Material	Code
PTFE glass/MoS ₂ compound	GM201

O-ring

Material	Code	Hardness
Nitrile rubber NBR	NBR	70 Shore A
Fluoro rubber FKM	FKM	70 Shore A

Operating conditions

Material	80 NBR B241	80 FKM K670
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-10 ... +150
HFA fluids	+5 ... +60	+5 ... +60
HFB fluids	+5 ... +60	+5 ... +60
HFC fluids	-30 ... +60	-10 ... +40
HFD fluids	-	-10 ... +150
Water	+5 ... +100	+5 ... +100
HETG (rapeseed oil)	-30 ... +80	-10 ... +80
HEES (synthetic esters)	-30 ... +80	-10 ... +100
HEPG (glycol)	-30 ... +60	-10 ... +80
Mineral greases	-30 ... +100	-10 ... +150
Pressure p in MPa	40	
Running speed v in m/s	0,5	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

The surface hardness must be approx. 45 to 60 HRC (depth of hardening min. 0,5 mm). Percentage contact area M₁ >50% to max 90% at cutting depth c = Rz/2 and reference line C ref = 0%. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

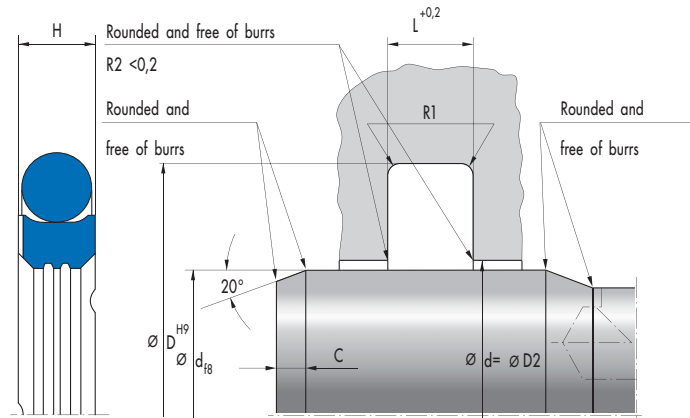
Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation and dimension d2

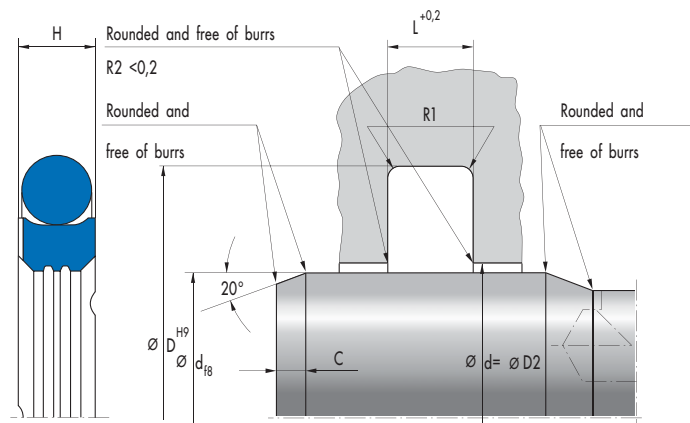
Nominal Ø d	Borehole	Shaft	Groove base
... 500	H9	f8	H9
>500	H8	f7	H8

Article list



d	D	R ₁	L	C	Profile	Material	Article No.	
20	27,5	0,5	3,2	3	3,75	PTFE GM201	24336291	●
25	32,5	0,5	3,2	3	3,75	PTFE GM201	24342634	○
28	35,5	0,5	3,2	3	3,75	PTFE GM201	24342635	○
30	37,5	0,5	3,2	3	3,75	PTFE GM201	24332459	○
30	41	0,5	4,2	3	5,5	PTFE GM201	24260303	○
30	41	0,5	4,2	3	5,5	PTFE GM201	24263153	○
32	39,5	0,5	3,2	3	3,75	PTFE GM201	24342636	○
35	46	0,5	4,2	3	5,5	PTFE GM201	24288862	○
36	47	0,8	4,2	3	5,5	PTFE GM201	24261511	○
40	51	0,8	4,2	3	5,5	PTFE GM201	24260912	○
40	55,5	0,8	6,3	5	7,75	PTFE GM201	24263148	○
45	56	0,8	4,2	3	5,5	PTFE GM201	24342638	●
50	61	0,8	4,2	3	5,5	PTFE GM201	24244043	●
50	61	0,8	4,2	3	5,5	PTFE GM201	24260913	○
50	65,5	0,8	6,3	5	7,75	PTFE GM201	24332753	○
55	66	0,8	4,2	4	5,5	PTFE GM201	24339230	○
56	67	0,8	4,2	4	5,5	PTFE GM201	24342640	○
60	71	0,8	4,2	4	5,5	PTFE GM201	24344647	○
63	74	0,8	4,2	4	5,5	PTFE GM201	24342641	○
65	76	0,8	4,2	4	5,5	PTFE GM201	24379352	○
65	80,5	0,8	6,3	5	7,75	PTFE GM201	24262462	○
70	81	0,8	4,2	4	5,5	PTFE GM201	24261512	●
75	86	0,8	4,2	4	5,5	PTFE GM201	24274587	○
75	90,5	0,8	6,3	6	7,75	PTFE GM201	24379083	○
80	91	0,8	4,2	6	5,5	PTFE GM201	24269431	●
80	95,5	0,8	6,3	6	7,75	PTFE GM201	24268439	○
80	95,5	0,8	6,3	6	7,75	PTFE GM201	24379084	○
85	100,5	0,8	6,3	6	7,75	PTFE GM201	24374977	○
90	101	0,8	4,2	4	5,5	PTFE GM201	24295714	○
90	105,5	0,8	6,3	6	7,75	PTFE GM201	24269461	●
100	111	0,8	4,2	4	5,5	PTFE GM201	24334450	●
100	115,5	0,8	6,3	6	7,75	PTFE GM201	24372600	○
100	115,5	0,8	6,3	6	7,75	PTFE GM201	24379085	○
110	121	0,8	4,2	4	5,5	PTFE GM201	24342642	○
110	125,5	0,8	6,3	6	7,75	PTFE GM201	24269828	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	R ₁	L	C	Profile	Material	Article No.	
115	126	0,8	4,2	4	5,5	PTFE GM201	24275310	○
120	131	0,8	4,2	4	5,5	PTFE GM201	24244324	●
125	136	0,8	4,2	4	5,5	PTFE GM201	24342643	○
125	140,5	0,8	6,3	6	7,75	PTFE GM201	24264533	○
140	151	0,8	4,2	4	5,5	PTFE GM201	24342644	○
140	155,5	0,8	6,3	6	7,75	PTFE GM201	24275177	○
150	161	0,8	4,2	4	5,5	PTFE GM201	24342645	○
150	165,5	0,8	6,3	6	7,75	PTFE GM201	24275214	○
160	171	0,8	4,2	4	5,5	PTFE GM201	24332460	○
160	175,5	0,8	6,3	6	7,75	PTFE GM201	24345425	○
180	191	0,8	4,2	4	5,5	PTFE GM201	24265195	○
180	191	0,8	4,2	4	5,5	PTFE GM201	24360171	○
180	195,5	0,8	6,3	6	7,75	PTFE GM201	24258164	○
190	201	0,8	4,2	4	5,5	PTFE GM201	531984	○
200	215,5	1,2	6,3	6	7,75	PTFE GM201	24342646	○
220	235,5	1,2	6,3	6	7,75	PTFE GM201	24342647	○
240	255,5	1,2	6,3	6	7,75	PTFE GM201	24300256	○
250	265,5	1,2	6,3	6	7,75	PTFE GM201	24258166	○
280	301	1,2	8,1	7	10,5	PTFE GM201	24361776	○
280	301	1,2	8,1	7	10,5	PTFE GM201	24362271	○
285	306	2	8,1	7,5	10,5	PTFE GM201	24360172	○
305	326	2	8,1	7,5	10,5	PTFE GM201	24360876	○
320	344,5	2	8,1	8	12,25	PTFE GM201	24348407	○
335	356	2	8,1	7,5	10,5	PTFE GM201	24269406	○
350	374,5	2	8,1	8	12,25	PTFE GM201	24352373	○
360	384,5	2	8,1	8	12,25	PTFE GM201	49006745	○
375	396	2	8,1	7,5	10,5	PTFE GM201	533623	○
380	401	2	8,1	7,5	10,5	PTFE GM201	49011805	○
380	404,5	2	8,1	7,5	12,25	PTFE GM201	24377578	○
400	424,5	2	8,1	8	12,25	PTFE GM201	24257070	○
460	484,5	2	8,1	8	12,25	PTFE GM201	24373000	○
475	499,5	2	8,1	8	12,25	PTFE GM201	24296663	○
530	551	2	8,1	7,5	10,5	PTFE GM201	24349316	○
680	708	2	9,5	11	14	PTFE GM201	24261907	○
1000	1028	2	9,5	11	14	PTFE GM201	24377339	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Rotomatic M 16

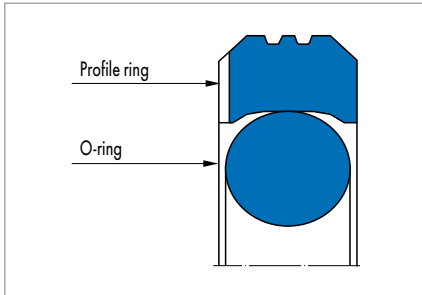


Fig. 1 Merkel Rotomatic M 16

Material

PTFE profile ring

Material	Code
PTFE glass/MoS ₂ compound	PTFE GM201

O-ring

Material	Code	Hardness
Nitrile rubber	80 NBR B241	70 Shore A
Fluoro rubber	80 FKM K670	70 Shore A

Product description

Two-piece Merkel seal set for sealing pistons, consisting of one PTFE profile ring and an O-ring as a pre-load component.

Product advantages

Double-acting piston seal for pivoting motions in hydraulic systems; for standardised housing according to ISO 7425/1; preferably for usage in hydraulic joints and rotary joints.

- Short
- Highly resistant to hydraulic fluids
- Low friction, free of stick-slip.

Application

Excavators, grippers, rotary joints.

Operating conditions

Material	PTFE GM201	PTFE GM201
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-10 ... +150
HFA fluids	+5 ... +60	+5 ... +60
HFB fluids	+5 ... +60	+5 ... +60
HFC fluids	-30 ... +60	-10 ... +40
HFD fluids	-	-10 ... +150
Water	+5 ... +100	+5 ... +100
HETG (rapeseed oil)	-30 ... +80	-10 ... +80
HEES (synthetic esters)	-30 ... +80	-10 ... +100
HEPG (glycol)	-30 ... +60	-10 ... +80
Mineral greases	-30 ... +100	-10 ... +150
Pressure p in MPa	40	
Running speed v in m/s	0,5	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

The surface hardness must be approx. 45 to 60 HRC (depth of hardening min. 0,5 mm). Percentage contact area M₁ >50% to max 90% at cutting depth c = Rz/2 and reference line C ref = 0%. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

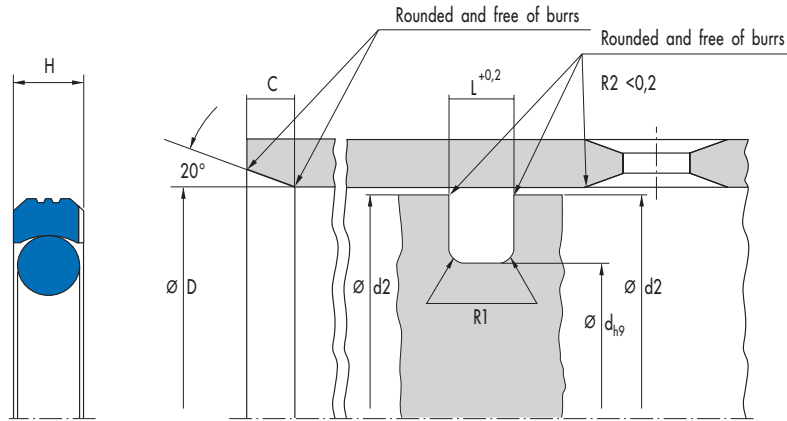
Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Nominal Ø d	Borehole	Shaft	Groove base
... 500	h9	H8	h9
>500	h8	H7	h8

Article list



d	D	R ₁	L	C	Profile	Material	Article No.	
35,1	40	0,2	2,2	6	2,45	PTFE GM201 / NBR	24344591	○
35,1	40	0,2	2,2	6	2,45	PTFE GM201 / NBR	24344600	○
37,5	45	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344592	○
37,5	45	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344601	○
42,5	50	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344593	○
42,5	50	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344602	○
47,5	55	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344594	○
47,5	55	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344603	○
52,5	60	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344595	○
52,5	60	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344604	○
54	65	0,8	4,2	8	5,5	PTFE GM201 / NBR	24351853	○
55,5	63	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344596	○
55,5	63	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344605	○
62,5	70	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344597	○
62,5	70	0,5	3,2	6	3,75	PTFE GM201 / NBR	24344606	○
67,5	75	0,5	3,2	6	3,75	PTFE GM201 / NBR	24378533	○
69	80	0,8	4,2	8	5,5	PTFE GM201 / NBR	24275277	○
69	80	0,8	4,2	8	5,5	PTFE GM201 / NBR	24344607	○
79	90	0,8	4,2	8	5,5	PTFE GM201 / NBR	24344598	○
79	90	0,8	4,2	8	5,5	PTFE GM201 / NBR	24344608	○
84	95	0,8	4,2	8	5,5	PTFE GM201 / FKM	24376140	○
87	98	0,8	4,2	8	5,5	PTFE GM201 / FKM	24359814	○
89	100	0,8	4,2	8	5,5	PTFE GM201 / FKM	24344628	○
89	100	0,8	4,2	8	5,5	PTFE GM201 / FKM	24344633	○
94	105	0,8	4,2	8	5,5	PTFE GM201 / FKM	24360325	○
94	105	0,8	4,2	8	5,5	PTFE GM201 / FKM	24362662	○
99	110	0,8	4,2	8	5,5	PTFE GM201 / FKM	24344625	○
99	110	0,8	4,2	8	5,5	PTFE GM201 / FKM	24344629	○
114	125	0,8	4,2	8	5,5	PTFE GM201 / FKM	24261557	○
114	125	0,8	4,2	8	5,5	PTFE GM201 / FKM	24344630	○
124,5	140	1,2	6,3	10	7,75	PTFE GM201 / FKM	24265781	○
129,5	145	1,2	6,3	10	7,75	PTFE GM201 / FKM	24295612	○
134,5	150	1,2	6,3	10	7,75	PTFE GM201 / FKM	24344626	○
134,5	150	1,2	6,3	10	7,75	PTFE GM201 / NBR	24344655	○
144,5	160	1,2	6,3	10	7,75	PTFE GM201 / NBR	24344627	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	R ₁	L	C	Profile	Material	Article No.	
144,5	160	1,2	6,3	10	7,75	PTFE GM201 / NBR	24344632	○
154,5	170	1,2	6,3	10	7,75	PTFE GM201 / FKM	24362008	○
164,5	180	1,2	6,3	10	7,75	PTFE GM201 / FKM	24344599	○
164,5	180	1,2	6,3	10	7,75	PTFE GM201 / FKM	24344609	○
165	149,5	1,2	6,3	10	7,75	PTFE GM201 / FKM	24380085	○
184,5	200	1,2	6,3	10	7,75	PTFE GM201 / NBR	24333651	○
184,5	200	1,2	6,3	10	7,75	PTFE GM201 / FKM	24344610	○
204,5	220	1,2	6,3	10	7,75	PTFE GM201 / NBR	24330686	○
204,5	220	1,2	6,3	10	7,75	PTFE GM201 / NBR	24344611	○
224,5	240	1,2	6,3	10	7,75	PTFE GM201 / FKM	24331499	○
234,5	250	1,2	6,3	10	7,75	PTFE GM201 / NBR	24331860	○
234,5	250	1,2	6,3	10	7,75	PTFE GM201 / NBR	24344612	○
254,5	270	1,2	6,3	10	7,75	PTFE GM201 / FKM	24350021	○
264,5	280	1,2	6,3	10	7,75	PTFE GM201 / NBR	24377949	○
284,5	300	1,2	6,3	10	7,75	PTFE GM201 / NBR	24369438	○
289	310	1,2	8,1	10	10,5	PTFE GM201 / NBR	24341182	○
299	320	1,2	8,1	10	10,5	PTFE GM201 / FKM	49004641	○
314,5	330	1,2	6,3	10	7,75	PTFE GM201 / NBR	24331955	○
335,5	360	1,2	8,1	10	12,25	PTFE GM201 / NBR	24366844	○
339	360	1,2	8,1	10	10,5	PTFE GM201 / NBR	531983	○
364	385	2	8,1	10	10,5	PTFE GM201 / NBR	24334111	○
375,5	400	2	8,1	12	12,25	PTFE GM201 / NBR	24363097	○
475,5	500	2	8,1	12	12,25	PTFE GM201 / NBR	24363098	○
605,5	630	2	8,1	12	12,25	PTFE GM201 / NBR	24363099	○
652	680	2	9,5	13	14	PTFE GM201 / FKM	24357188	○
682	710	2	9,5	13	14	PTFE GM201 / NBR	24374718	○
752	780	2	9,5	13	14	PTFE GM201 / FKM	24361922	○
772	800	2	9,5	13	14	PTFE GM201 / FKM	24374719	○
792	820	2	9,5	13	14	PTFE GM201 / FKM	24356201	○
872	900	2	9,5	13	14	PTFE GM201 / FKM	24345423	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Rotomatic M 17

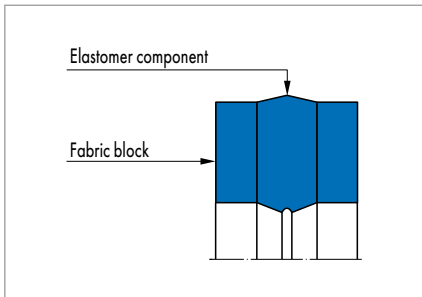


Fig. 1 Merkel Rotomatic M 17

Product description

Single-piece Merkel sealing ring comprising an elastomer part firmly set by fabric blocks on both sides which is provided with an oil groove at the contact area.

Product advantages

Double-acting rod seal for pivoting motions in hydraulic systems, preferably for usage in hydraulic joints and rotary joints

- Wear-resistant
- Secure static sealing.

Application

Excavators, grippers, rotary joints.

Material

Material	Code
Nitrile rubber NBR	80 NBR B246/BI-NBR B3B248

Operating conditions

Material	80 NBR B246/BI-NBR B3B248
Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +80
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +80
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +80
Pressure p in MPa	20
Running speed v in m/s	0,1

If the seal set is to be used for permanent rotational movement, please consult us first. Other material combinations are available on request.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

The surface hardness must be approx. 45 to 60 HRC (depth of hardening min. 0,5 mm). Percentage contact area M_c >50% to max 90% at cutting depth c = Rz/2 and reference line C ref = 0%. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

Design notes

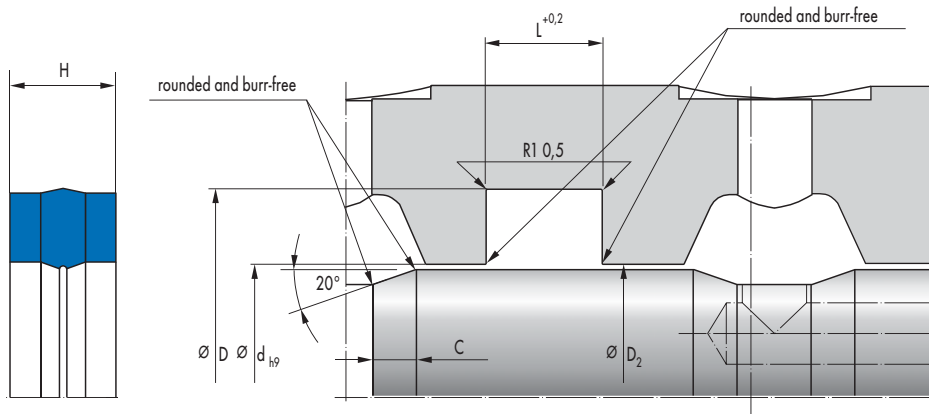
Please observe our general design notes in → Technical Manual.

Tolerance recommendation

Recommended fit for pressures up to 20 MPa

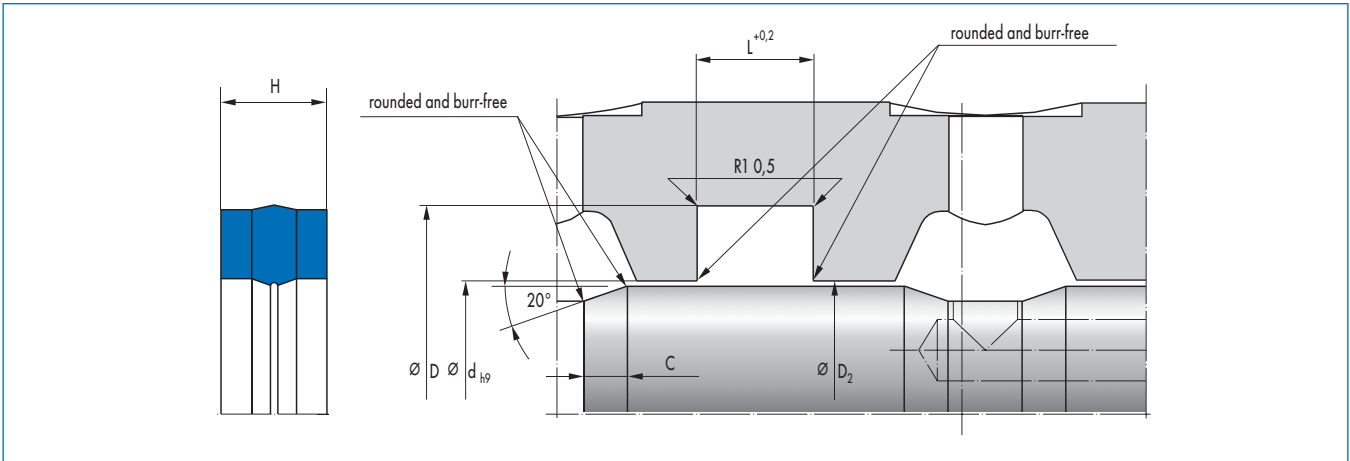
Nominal Ø d	Borehole	Shaft	Groove base
... 60	H8	f8	H9
>60	H7	f7	H9

Article list



d	D	L	C	Profile	Material	Article No.	
10	18	6,5	3	4	80 NBR B246	24024279	●
20	28	6,5	2,5	4	80 NBR B246	24024285	●
22	30	6,5	2,5	4	80 NBR B246	24024286	●
25	35	8	3	5	80 NBR B246	24024287	●
28	38	8	3	5	80 NBR B246	24024288	○
30	40	8	3	5	80 NBR B246	24024289	●
32	42	8	3	5	80 NBR B246	24024290	●
35	45	8	3	5	80 NBR B246	24024291	●
36	46	8	3	5	80 NBR B246	24024292	○
40	52	8	3	6	80 NBR B246	24024212	●
42	54	8	3	6	80 NBR B246	24024293	●
45	57	8	3	6	80 NBR B246	24024294	●
50	62	8	3	6	80 NBR B246	24024295	●
55	67	8	3	6	80 NBR B246	24024296	●
56	68	8	3	6	80 NBR B246	24024297	●
60	75	11	3,5	7,5	80 NBR B246	24024298	●
63	78	11	3,5	7,5	80 NBR B246	24024299	○
65	80	11	3,5	7,5	80 NBR B246	24024300	●
70	85	11	3,5	7,5	80 NBR B246	24024301	●
75	90	11	3,5	7,5	80 NBR B246	24024302	●
80	95	11	3,5	7,5	80 NBR B246	24024303	●
85	100	11	3,5	7,5	80 NBR B246	24024304	●
90	110	13	5	10	80 NBR B246	24024305	●
100	120	13	5	10	80 NBR B246	24024306	●
110	130	13	5	10	80 NBR B246	24024307	●
115	135	13	5	10	80 NBR B246	24024308	●
125	145	13	5	10	80 NBR B246	24026976	●
140	160	13	5	10	80 NBR B246	24024310	●
150	175	16	5	12,5	80 NBR B246	24024311	●
160	185	16	5,5	12,5	80 NBR B246	24024312	●
170	190	13	5	10	80 NBR B246	24024266	○
180	205	16	5,5	12,5	80 NBR B246	24024313	●
200	225	16	5,5	12,5	80 NBR B246	24024314	●
225	255	19	6	15	80 NBR B246	24127447	○
250	270	17	5	10	80 NBR B246	24024270	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	L	C	Profile	Material	Article No.	
310	340	19	6	15	80 NBR B246	24035509	○
320	345	13	5	12,5	80 NBR B246	24078636	○
360	378	13	5	9	80 NBR B246	24029629	○
380	400	16	5,5	10	80 NBR B246	24174996	○
440	460	13	5	10	80 NBR B246	24137980	○
500	520	16	5,5	10	80 NBR B246	24063830	○
680	720	25	7	20	80 NBR B246	24143612	○
750	790	26	7	20	80 NBR B246	24136568	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Rotomatic M 19

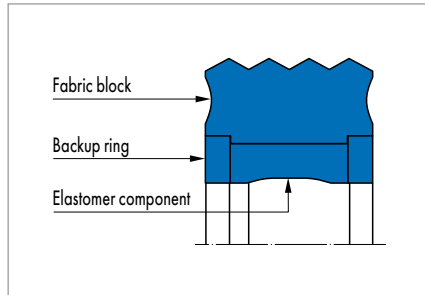


Fig. 1 Merkel Rotomatic M 19

Product description

Three-part Merkel seal set, consisting of an elastomer part with fabric reinforcement on the contact area which is formed so that two sealing edges form an oil groove, as well as two activated back-up rings.

Product advantages

Double-acting rod seal for pivoting motions in hydraulic systems, preferably for usage in hydraulic joints and rotary joints

- Extrusion-secured through activated back-up ring
- Wear-resistant.

Application

Excavators, grippers, rotary joints.

Material

Material	Code
Nitrile rubber NBR/POM	80 NBR B246/BI-NBR B4 B285/POM PO202

Operating conditions

Material	80 NBR B246/BI-NBR B4 B285/POM PO202
Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +80
HFA fluids	+5 ... +60
HFB fluids	+5 ... +60
HFC fluids	-30 ... +60
HFD fluids	-
Water	+5 ... +80
HETG (rapeseed oil)	-30 ... +80
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +60
Mineral greases	-30 ... +80
Pressure p in MPa	40
Running speed v in m/s	0,2

If the seal set is to be used for permanent rotational movement, please consult us first.

Surface quality

Surface roughness	R_a	R_{max}
Sliding surface	0,05 ... 0,3 μm	$\leq 2,5 \mu\text{m}$
Groove base	$\leq 1,6 \mu\text{m}$	$\leq 6,3 \mu\text{m}$
Groove flanks	$\leq 3,0 \mu\text{m}$	$\leq 15,0 \mu\text{m}$

The surface hardness must be approx. 45 to 60 HRC (depth of hardening min. 0,5 mm). Percentage contact area $M_c > 50\%$ to max 90% at cutting depth $c = Rz/2$ and reference line $C_{ref} = 0\%$. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

Design notes

Please observe our general design notes in → Technical Manual.

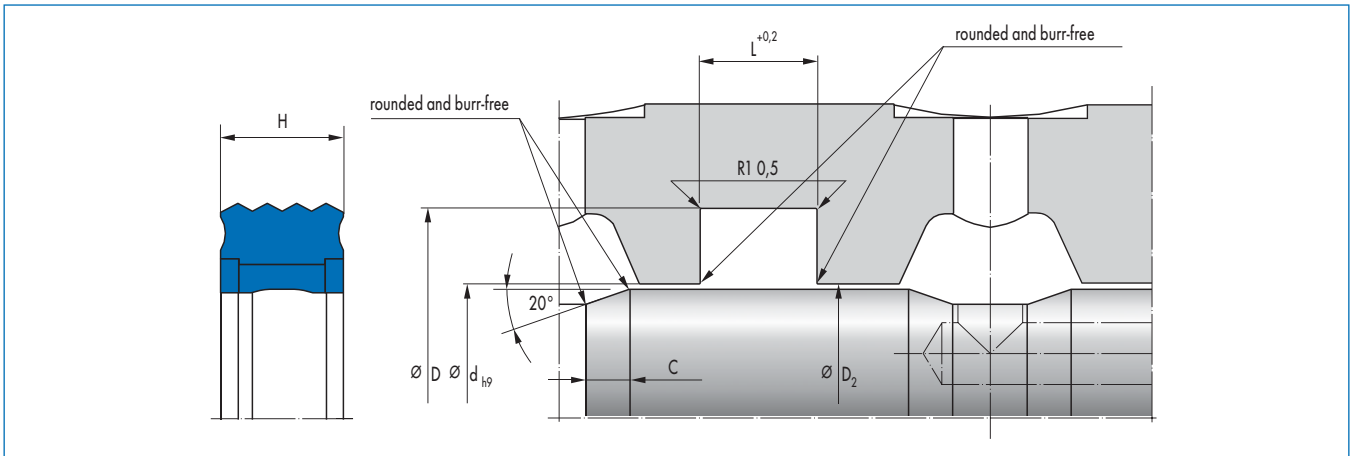
Tolerance recommendation and dimension d2

Recommended fit for pressures up to 40 MPa

Profile	D2	Tolerance level D2	Shaft	Groove base
7,5	d +0,2* d +0,3	H8	f8	H9
10,0	d +0,3* d +0,5	H8	f8	H9
12,5	d +0,5* d +0,7	H8	f8	H9

* In dependence on the H dimension of the back-up ring.

Article list



d	D	L	C	Profile	Material	Article No.	
60	72	10	5,5	6	80 NBR B246	24069210	○
70	85	11	5,5	7,5	80 NBR B246	24067432	○
80	95	11	5,5	7,5	80 NBR B246	24235577	●
90	110	13	7,5	10	80 NBR B246	24103500	○
95	112	10,8	7	8,5	80 NBR B246	24308835	○
95	112	11	7	8,5	80 NBR B246	24065060	●
100	120	13	7,5	10	80 NBR B246	24103501	○
110	130	13	7,5	10	80 NBR B246	24103502	●
125	145	13	7,5	10	80 NBR B246	24103504	●
130	150	11	7,5	10	80 NBR B246	24091083	●
140	160	13	7,5	10	80 NBR B246	24103505	○
150	170	13	7,5	10	80 NBR B246	24139281	○
160	185	16	8	12,5	80 NBR B219	24080888	○
180	205	16	8	12,5	80 NBR B246	24068319	○
200	225	16	8	12,5	80 NBR B219	24103506	○
290	320	19	8	15	80 NBR B246	24195361	○
365	390	16	8	12,5	80 NBR B246	24362038	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Simmerring Radiamatic® EWDR made of PTFE

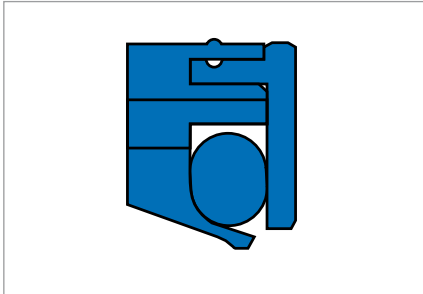


Fig.1 Simmerring Radiamatic® EWDR made of PTFE

Product description

Pressure-relieved Simmerring with a pressure ring made of PTFE compound, a stainless steel clamping ring and an O-ring (FKM) as a secondary seal.

Product advantages

Secure with simultaneous high pressure and high speed

- Low losses
- Low leak rate
- Easy fitting
- The shaft must not be machined on maintenance or seal replacement.

Application

- Primary seal in pumps and compressors
- Rotary joints for coolants and hydraulic fluid as well as gases
- Safety seal in addition to floating ring seals.

Material

PTFE carbon (standard quality)	Approved to KTW (drinking water) and BAM (oxygen)
PTFE Ekonol	Positively assessed by TNO, Nutrition and Food Research Laboratory (NL), for foodstuffs
Clamping ring	Usage of stainless steels

Operating conditions

Media	Resistance per FKM
Temperature	-20 ... +200 °C
Circumferential speed	max. 20 m/s for 1 MPa
Pressure difference	max. 3 MPa ... 0,2 MPa
For vacuum or pressure reversal	up to 0,2 MPa, housing closed

Surface, hardness

Peak-to-valley heights	R _a	R _t
Housing	<1,8 µm	<10,0 µm
Shaft, ground with no lead	0,1 ... 0,2 µm	0,5 ... 1,0 µm
Hardness of the contact area*	50-65 HRC, >0,5 mm depth of hardening	

* depending on material

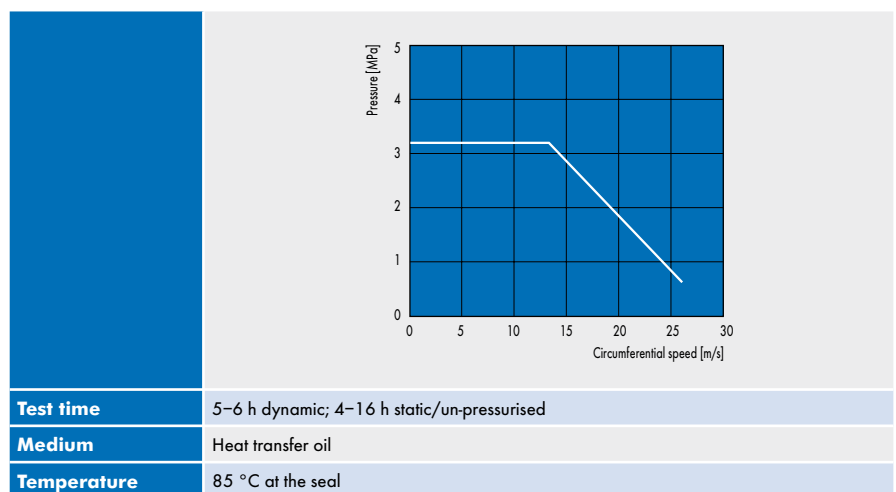
Design notes

Tolerances

Shaft	Radial shaft deflection, max.*
h11	±0,05 mm

* depending on increase in rotational speed, the radial shaft deflection may need to be more tightly limited. Please enquire.

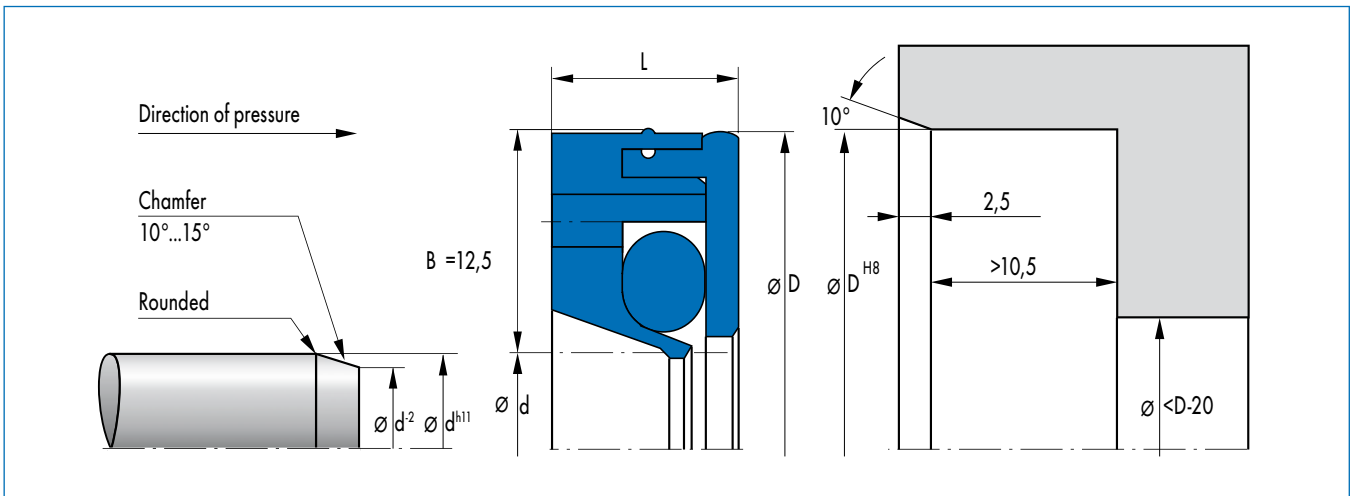
p · v Diagram



Test time	5-6 h dynamic; 4-16 h static/un-pressurised
Medium	Heat transfer oil
Temperature	85 °C at the seal

Fitting & installation

Fitting sequence: press Simmerring Radiamatic EWDR into housing; insert shaft.



$\varnothing d$	$\varnothing D$	L
20	45	10,5
25	50	10,5
28	53	10,5
30	55	10,5
35	60	10,5
40	65	10,5
45	70	10,5
50	75	10,5
55	80	10,5
60	85	10,5
65	90	10,5
70	95	10,5
75	100	10,5
80	105	10,5
90	115	10,5
100	125	10,5

Other dimensions on enquiry.

Simmerring Radiamatic® HTS II made of PTFE

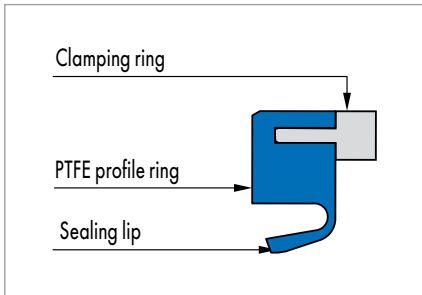


Fig. 1 Simmerring Radiamatic® HTS II made of PTFE

Product description

Simmerring for open housings. Significantly reduced lip pre-load compared to conventional geometries with high level of protection against leaks.

Product advantages

- Low friction torque
- Good dry running properties
- Low clearance volume
- Easy to clean
- Type can be easily matched to housing.

Application

Rotary pumps, agitators, gearboxes, fans, compressors, mixers, machine tools.

Material

PTFE carbon (standard quality)	Approved to KTW (drinking water) and BAM (oxygen)
PTFE Ekonol	Positively assessed by TNO, Nutrition and Food Research Laboratory (NL), for foodstuffs
Clamping ring	Usage of stainless steels

Operating conditions

Temperature range	-20 ... +200 °C
Circumferential speed	18 m/s for 0,15 MPa
Abs. pressure	0,6 MPa

When used un-pressurised, significantly higher circumferential speeds are possible. Special versions are available for alternating operation in pressure/vacuum.

Surface, hardness

Peak-to-valley heights	R_a	R_t
Housing	<1,8 μm	$\leq 10,0 \mu\text{m}$
Shaft, ground with no lead	0,1 ... 0,2 μm	0,5 ... 1,0 μm
Hardness of the contact area	50 ... 65 HRC, >0,5 mm depth of hardening	

The surface hardness of the running surface must be approx. 30 HRC.

Percentage contact area $M_v > 50\%$ up to max. 90% at cutting depth $c = Rz/2$ and reference line $C_{ref} = 0\%$.

Design notes

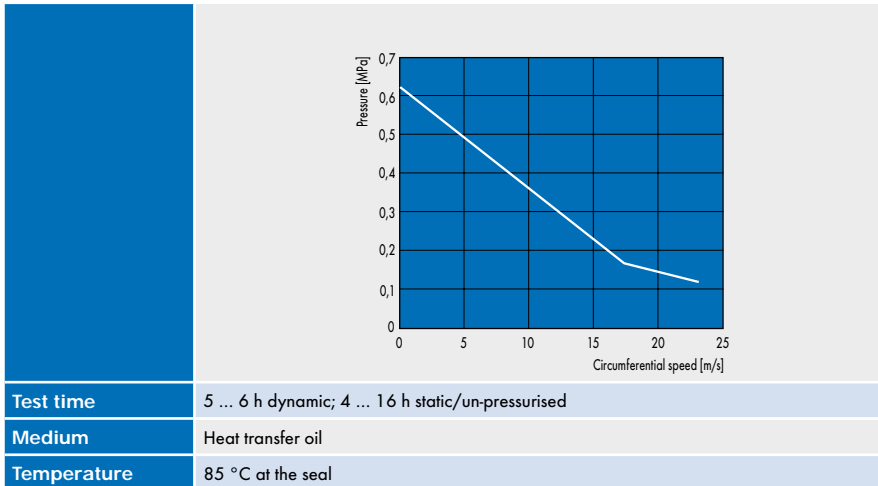
Please observe our general design notes in → Technical Manual.

Tolerances

Housing bore	Shaft	Radial shaft deflection, max.*
H8	h11	±0,05 mm

* depending on increase in rotational speed, the radial shaft deflection may need to be more tightly limited. Please enquire.

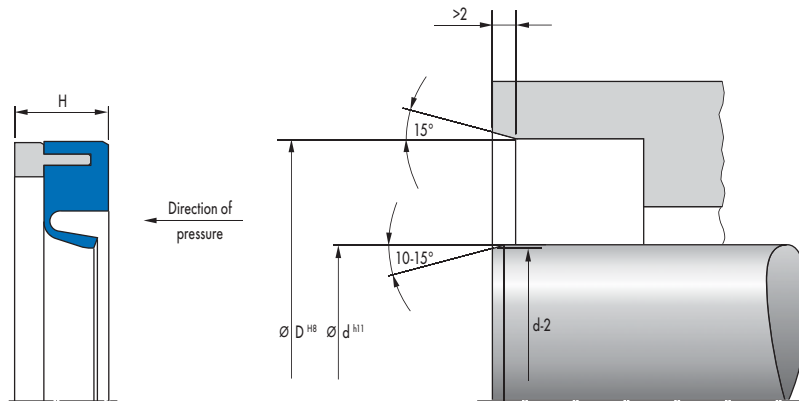
p · v Diagram



Fitting & installation

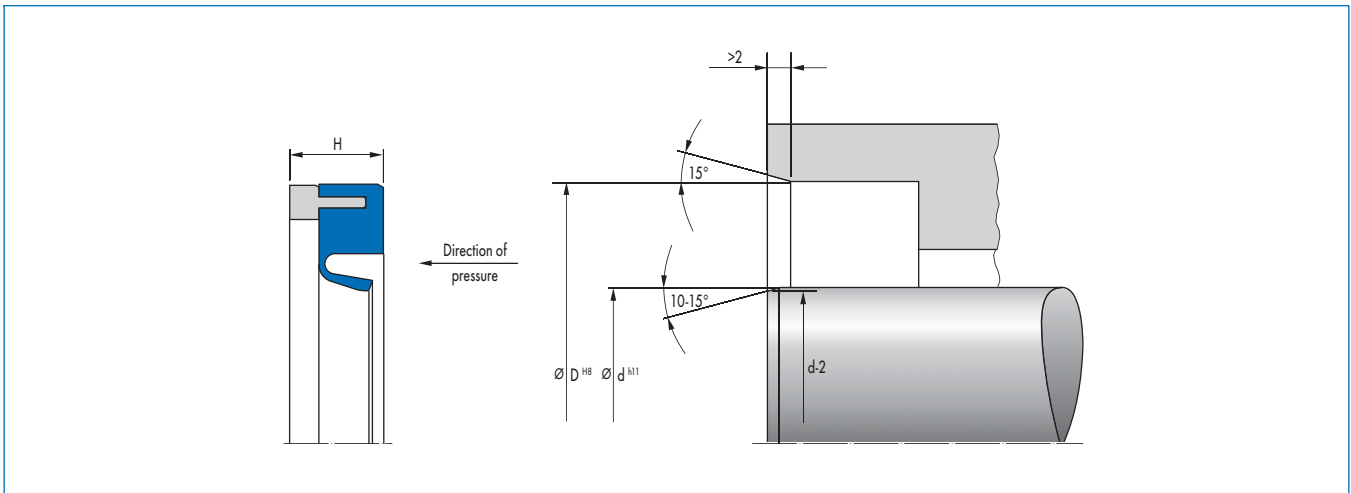
Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Article list



Width	D	L	Material	Article No.	
10	22	7	PTFE K212	24339323	○
12	22	7	PTFE K212	24339324	○
12	28	7	PTFE K212	24339325	○
15	30	7	PTFE K212	24339326	○
15	35	7	PTFE K212	24339327	○
17	35	7	PTFE K212	24339328	○
18	30	7	PTFE K212	24339329	○
20	30	7	PTFE K212	24339330	○
20	32	7	PTFE K212	24339331	○
20	35	7	PTFE K212	24339332	○
20	40	7	PTFE K212	24339333	○
22	40	7	PTFE K212	24339334	○
25	40	7	PTFE K212	24339335	○
25	42	7	PTFE K212	24339336	○
28	40	7	PTFE K212	24339337	○
28	47	7	PTFE K212	24339338	○
30	40	7	PTFE K212	24339339	○
30	42	7	PTFE K212	24339340	○
30	47	7	PTFE K212	24339341	○
30	52	7	PTFE K212	24339342	○
32	47	7	PTFE K212	24339343	○
35	47	7	PTFE K212	24339344	○
40	52	7	PTFE K212	24339345	○
42	62	8	PTFE K212	24339346	○
45	62	8	PTFE K212	24339347	○
45	65	8	PTFE K212	24339348	○
50	68	8	PTFE K212	24339349	○
50	72	8	PTFE K212	24339350	○
55	70	8	PTFE K212	24339351	○
55	80	8	PTFE K212	24339352	○
60	75	8	PTFE K212	24339353	○
60	80	8	PTFE K212	24339354	○
60	85	8	PTFE K212	24339355	○
65	85	10	PTFE K212	24339356	○
65	90	10	PTFE K212	24339357	○

● Available from stock ○ On request: Tool is available, delivery at short notice



Width	D	L	Material	Article No.	
70	90	10	PTFE K212	24339358	○
70	100	10	PTFE K212	24339359	○
75	95	10	PTFE K212	24339360	○
75	100	10	PTFE K212	24339361	○
80	100	10	PTFE K212	24339362	○
80	110	10	PTFE K212	24339363	○
85	100	12	PTFE K212	24339364	○
90	120	12	PTFE K212	24339365	○
95	120	12	PTFE K212	24339366	○
100	120	12	PTFE K212	24339367	○
100	130	12	PTFE K212	24339368	○
110	130	12	PTFE K212	24339369	○
125	150	12	PTFE K212	24339370	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Simmerring Radiamatic® R 35

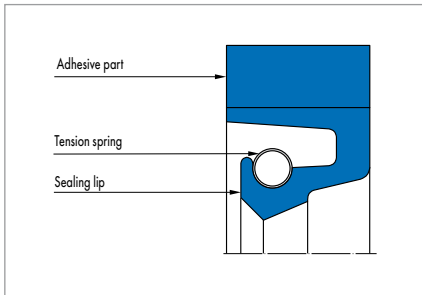


Fig. 1 Simmerring Radiamatic® R 35

Product description

Simmerring with a fabric reinforced static part that is securely joined to the elastomer sealing lip. The sealing lip is also pre-loaded with a garter spring.

Product advantages

Sealing ring is used, in case of adequate lubrication by the medium to be sealed, preferably where shafts pass through walls in mills and large gearboxes in heavy machinery manufacture.

- Particularly robust static part
- Lasting radial contact pressure
- Highly wear-resistant.

Application

Mills, ship building, steel hydraulics engineering, wind power plants.

Material

Sealing lip	Static part	Tension spring
80 NBR B241	Impregnated cotton fabric B4 B248	ST 1.4571
80 FKM K670	Impregnated aramide fabric C2 K670	ST 1.4571
75 HNBR U467	Impregnated aramide fabric C2 U464	ST 1.4571

Operating conditions

Material	80 NBR B241	80 FKM K670	75 HNBR U467
	Temperature range in °C		
Mineral oils	-30 ... +100	-10 ... +180	-20 ... +140
Water	+5 ... +100	+5 ... +80	+5 ... +100
Lubricating greases	-30 ... +100	-10 ... +180	-20 ... +140
Rolling oil emulsion	on enquiry		
Pressure p in MPa	0,05		
Running speed v in m/s	20	25	25

Other media on enquiry. Application parameters are recommended values, do not utilise all parameters simultaneously.

Surface quality

Peak-to-valley heights	R_a	R_{max}
Running surface	$\leq 0,6 \mu\text{m}$	$\leq 2,5 \mu\text{m}$
Housing	$\leq 4 \mu\text{m}$	$\leq 15 \mu\text{m}$

The contact area is machined by plunge grinding, i.e. without feed. The surface hardness must be approx. 60 HRC (depth of hardening min. 0,5 mm). With increasing circumferential speed the contact area should be manufactured with increasing peak-to-valley heights R_a . The surface should not be too smooth so that an adequate film of lubricant can form. Recommended value: $R_{a \text{ min}} = 0,1 \mu\text{m}$. Percentage contact area $M_t > 50\%$ to max. 90% at cutting depth $c = R_z/2$ and reference line $C_{\text{ref}} = 0\%$. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

Design notes

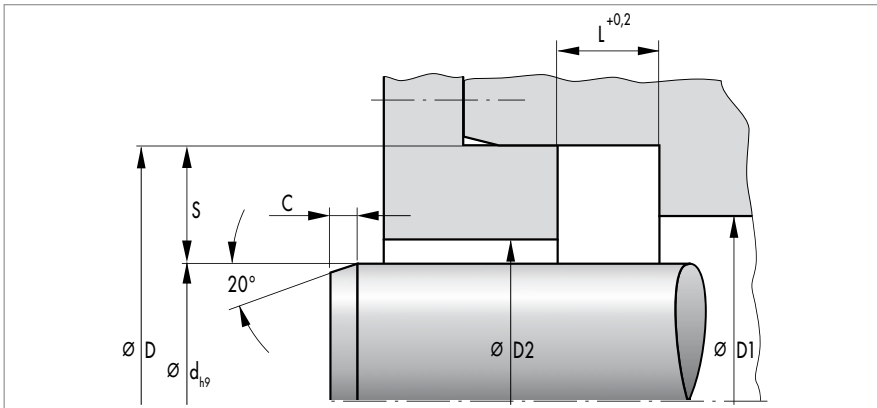


Fig. 2

Please observe our general design notes in → Technical Manual.

Lead-in chamfers

See dimension "C" in the article list.

Tolerances

D	Tolerance
<500	H8
>500	+0,0004 x D

Overall eccentricity

The permissible overall eccentricity (static and dynamic eccentricity) between shaft and housing is dependent on the seal profile and circumferential speed. If necessary, we will provide recommended values.

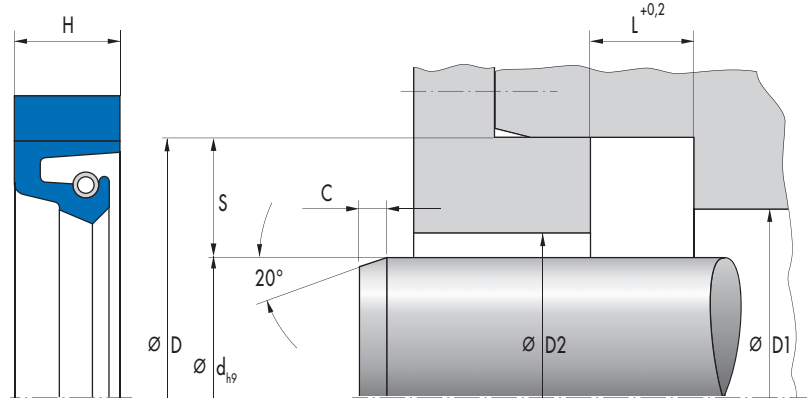
Housing recommendations for new designs

d	S (Profile)	L
>100	20	16
>250	22	20
<450	25	22
>750	32	25

Fitting & installation

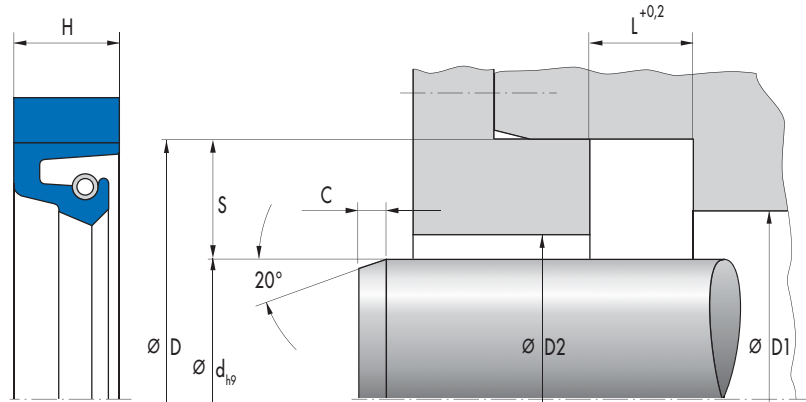
For Simmerring Radiamatic R 35 an axially accessible housing is necessary, as the rings must have low inclination. The Radiamatic R 35 rings are supplied with oversize seal width. For reliable function the Radiamatic R rings must be axially compressed to the dimension "L". An open housing with cover plate and tightening screws is necessary. Specific deformation forces are necessary for the compression. The cover plate and the tightening screws are to be designed appropriately. Please request recommended values.

Article list



Width	D	L	D ₁	D ₂	C	Material	Article No.	
100	125	10	112,5	104	8	80 NBR B241	24019355	○
100	125	12,5	112,5	104	8	80 NBR B241	24019354	○
100	130	16	115	105	8	80 NBR B241	24084477	○
100	132	12,5	116	105	8	80 NBR B241	24019356	○
100	140	16	120	107	8	80 NBR B241	24199219	○
105	145	16	125	112	8	80 NBR B241	24091749	○
110	135	10	122,5	114	8	80 NBR B241	24019358	○
110	135	12,5	122,5	114	8	80 NBR B241	24019357	○
110	140	13	125	115	8	80 NBR B241	24019359	○
110	140	13	125	115	8	80 FKM K670	24294262	○
110	140	16	125	115	8	80 NBR B241	24084489	○
110	140	16	125	115	8	80 NBR B241	24375934	○
110	150	16	130	117	8	80 NBR B241	24029888	○
120	150	16	135	125	8	80 NBR B241	24084491	○
120	160	16	140	127	8	80 NBR B241	24019360	○
125	155	12	140	130	8	80 NBR B241	24019361	○
125	155	12	140	130	8	80 FKM K670	24197677	○
125	165	15,8	145	132	8	80 NBR B241	24127755	○
130	160	15	145	135	8	80 NBR B241	24019362	○
130	170	16	150	137	8	80 NBR B241	24019363	○
140	170	16	155	145	8	80 NBR B241	24111679	○
140	180	16	160	147	8	80 NBR B241	24019364	○
146	177,8	15,9	161,9	151	8	80 NBR B241	24019365	○
150	180	12,7	165	155	8	80 NBR B241	24099375	○
150	180	13	165	155	8	80 FKM K670	24296764	○
150	180	16	165	155	8	80 NBR B241	24084493	○
150	190	16	170	157	8	80 NBR B241	24019366	○
160	190	16	175	165	8	80 NBR B241	24111683	○
160	200	16	180	167	8	80 NBR B241	24019367	○
170	200	16	185	175	8	80 NBR B241	24119486	○
170	200	16	185	175	8	80 FKM K670	24235848	○
170	210	16	190	177	8	80 FKM K670	24224263	○
170	210	16	190	177	8	80 NBR B241	24019368	○
177,8	215,9	15,9	196,85	182,8	8	80 NBR B241	24099675	○
180	215	18	197,5	185	8	80 FKM K670	24301711	○

● Available from stock ○ On request: Tool is available, delivery at short notice

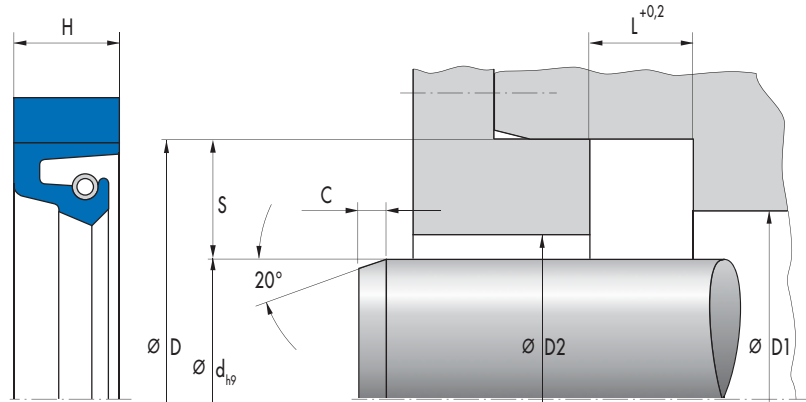


Width	D	L	D ₁	D ₂	C	Material	Article No.	
180	215	18	197,5	185	8	80 NBR B241	24111687	○
180	220	16	200	187	8	80 NBR B241	24080078	○
184,2	215,9	16	200,05	189,2	8	80 NBR B241	24089569	○
185	225	16	205	192	8	80 NBR B241	24019369	○
190	225	18	207,5	195	8	80 NBR B241	24084495	○
190	230	16	210	197	8	80 NBR B241	24093226	○
190	234	20	212	197	8	80 FKM K670	24343975	○
190,5	215,9	15,9	203,2	194,5	8	80 FKM K670	24193482	○
195	235	16	215	202	8	80 NBR B241	24019370	○
200	235	18	217,5	205	8	80 NBR B241	24111691	○
200	240	16	220	207	8	80 FKM K670	24332515	○
200	240	16	220	207	8	80 NBR B241	24019371	○
205	245	16	225	212	10	80 NBR B241	24075437	○
210	245	18	227,5	215	10	80 NBR B241	24111695	○
210	250	16	230	217	10	80 NBR B241	24056190	○
220	255	18	237,5	225	10	80 NBR B241	24109573	○
220	260	16	240	227	10	80 NBR B241	24019373	○
220	260	16	240	227	10	80 FKM K670	24180731	○
225	265	16	245	232	10	80 NBR B241	24076590	○
230	260	15,7	245	235	10	80 NBR B241	24107871	○
230	270	16	250	237	10	80 FKM K670	24260047	○
230	270	16	250	237	10	80 NBR B241	24019374	○
230	280	20	255	238	10	80 NBR B241	24019375	○
235	265	15	250	240	10	80 NBR B241	24082534	○
235	275	16	255	242	10	80 NBR B241	24055526	○
240	275	18	257,5	245	10	80 NBR B241	24084497	○
240	280	16	260	247	10	80 NBR B241	24019376	○
240	290	25	265	248	10	80 FKM K670	24343976	○
245	285	16	265	252	10	80 NBR B241	24019377	○
250	290	16	270	257	10	80 NBR B241	24019378	○
250	294	20	272	257	10	80 NBR B241	24019379	○
260	290	16	275	265	10	80 NBR B241	24019380	○
260	300	18	280	267	10	80 NBR B241	24111702	○
260	304	20	282	267	10	80 NBR B241	24029887	○
270	310	20	290	277	10	80 NBR B241	24084499	○
270	314	20	292	277	10	80 NBR B241	24019381	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Width	D	L	D ₁	D ₂	C	Material	Article No.	
272	304	15,8	288	277	10	80 NBR B241	24107874	○
273,1	317,5	19,1	295,32	280,1	10	80 FKM K670	24088545	○
280	320	16	300	287	10	80 FKM K670	24330886	○
280	320	16	300	287	10	80 NBR B241	24030348	○
280	320	18	300	287	10	80 NBR B241	24084515	○
280	320	20	300	287	10	80 NBR B241	24084500	○
280	324	20	302	287	10	80 FKM K670	24343977	○
280	324	20	302	287	10	80 NBR B241	24019383	○
290	330	20	310	297	10	80 NBR B241	24111392	○
295	339	20	317	302	10	80 NBR B241	24030425	○
298,5	336,5	22	317,5	305,5	10	80 NBR B241	24183955	○
300	340	16	320	307	10	80 NBR B241	24019386	○
300	340	20	320	307	10	80 NBR B241	24019385	○
300	340	20	320	307	10	80 FKM K670	24172753	○
300	344	20	322	307	10	80 NBR B241	24019387	○
305	355	22,5	330	313	10	80 NBR B241	24019389	○
310	354	20	332	317	10	80 NBR B241	24019390	○
311	345	18	328	316	10	80 NBR B241	24019391	○
315	343	14	329	320	10	80 NBR B241	24019392	○
315	355	16	335	322	10	80 NBR B241	24019395	○
317,5	355,6	15,9	336,55	322,5	10	80 NBR B241	24019396	○
320	350	15	335	325	10	80 NBR B241	24056225	○
320	360	18	340	327	10	80 NBR B241	24019397	○
320	360	20	340	327	10	80 NBR B241	24111395	○
320	364	20	342	327	10	80 NBR B241	24019398	○
325	369	20	347	332	10	80 NBR B241	24019399	○
330	374	20	352	337	10	80 NBR B241	24019401	○
340	372	20	356	345	10	80 NBR B241	24224500	○
340	380	20	360	347	10	80 NBR B241	24084501	○
340	384	20	362	347	10	80 NBR B241	24019402	○
350	380	20	365	355	10	80 NBR B241	24093956	○
350	390	20	370	357	10	80 NBR B241	24109577	○
350	394	20	372	357	10	80 NBR B241	24019403	○
355	399	20	377	362	10	80 NBR B241	24107203	○
360	400	20	380	367	10	80 NBR B241	24119489	○
360	404	20	382	367	10	80 NBR B241	24019407	○
362	406	19,5	384	369	10	80 NBR B241	24019408	○
362	406	19,5	384	369	10	80 FKM K670	24230599	○
370	414	20	392	377	10	80 NBR B241	24019409	○
370	420	20	395	378	10	80 NBR B241	24019410	○
374,6	419,1	21,8	396,83	381,6	10	80 NBR B241	24019411	○
380	420	20	400	387	10	80 NBR B241	24197026	○
380	424	20	402	387	10	80 NBR B241	24019413	○
385	429	20	407	392	10	80 NBR B241	24083793	○
385	435	22	410	393	10	80 NBR B241	526464	○
385	435	22	410	393	10	80 NBR B241	24076585	○
390	434	20	412	397	10	80 NBR B241	24019416	○
395	439	20	417	402	10	80 NBR B241	24019417	○
400	440	20	420	407	10	80 NBR B241	24136765	○
400	444	20	422	407	10	80 NBR B241	24056607	○

● Available from stock ○ On request: Tool is available, delivery at short notice

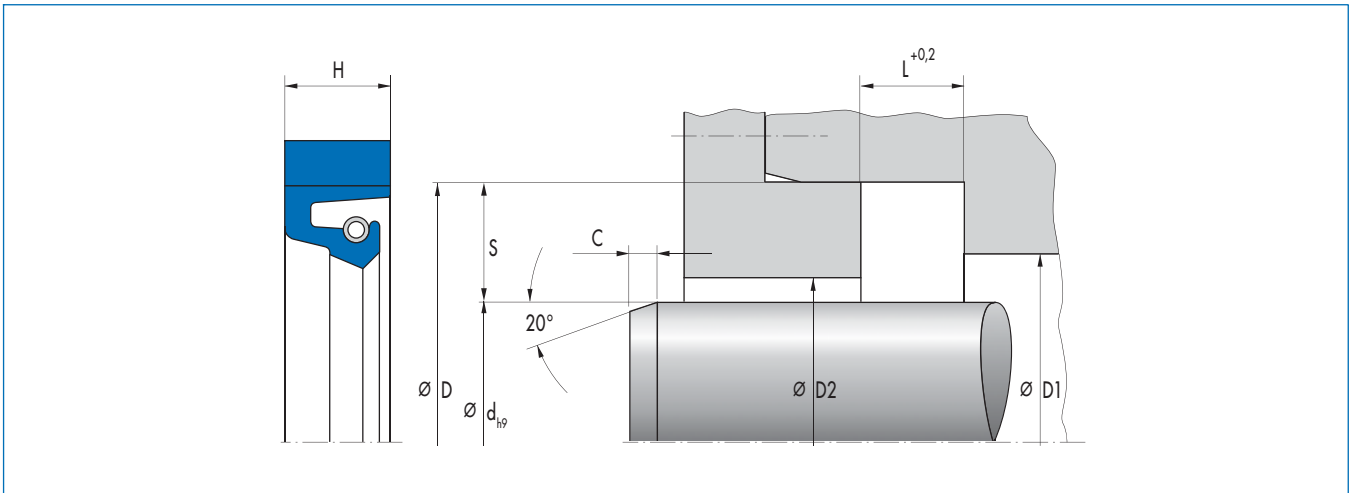


Width	D	L	D ₁	D ₂	C	Material	Article No.	
400	450	20	425	408	10	80 NBR B241	24019418	○
406,4	457,2	20,5	431,8	414,4	10	80 NBR B241	24069922	○
406,4	457,2	20,6	431,8	414,4	10	80 NBR B241	24019419	○
406,4	457,2	23	431,8	414,4	10	80 NBR B241	24019420	○
410	454	20	432	417	10	80 NBR B241	24078041	○
410	460	22	435	418	10	80 NBR B241	24029878	○
415	465	22	440	423	10	80 NBR B241	24019422	○
416	466	21,5	441	424	10	80 NBR B241	24019423	○
420	460	20	440	427	10	80 NBR B241	24074999	○
420	464	20	442	427	10	80 NBR B241	24027234	○
420	470	22	445	428	10	80 NBR B241	24019424	○
430	480	22	455	438	10	80 FKM K670	24335749	○
430	480	22	455	438	10	80 NBR B241	24019425	○
432	470	21,5	451	437	10	80 NBR B241	24096514	○
435	485	22	460	443	10	80 NBR B241	24019427	○
440	480	26	460	447	10	80 NBR B241	24019428	○
440	490	22	465	448	10	80 NBR B241	24019429	○
445	485	18	465	452	10	80 NBR B241	24019430	○
450	500	22	475	458	10	80 NBR B241	24019431	○
450	500	25	475	458	10	80 NBR B241	24084467	○
454	500	18	477	461	10	80 NBR B241	24030097	○
467	510	25	488,5	474	10	80 NBR B241	24019432	○
469,9	520,7	23	495,3	477,9	10	80 NBR B241	24019433	○
480	524	20	502	487	10	80 NBR B241	24027235	○
480	530	22	505	488	10	80 FKM K670	24335750	○
480	530	22	505	488	10	80 NBR B241	24084513	○
485	535	22	510	493	10	80 NBR B241	24019435	○
493	543	26	518	501	10	80 NBR B241	24056443	○
500	544	20	522	507	10	80 NBR B241	24073973	○
500	550	22	525	508	10	80 NBR B241	24019436	○
510	554	19,5	532	517	13	80 NBR B241	24019437	○
510	560	22	535	518	13	80 NBR B241	24237637	○
520	570	22	545	528	13	80 FKM K670	24335752	○
520	570	22	545	528	13	80 FKM K670	24375846	○
520	570	22	545	528	13	80 NBR B241	24019438	○
525	575	22	550	533	13	80 NBR B241	24023845	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Width	D	L	D ₁	D ₂	C	Material	Article No.	
530	580	22	555	538	13	80 NBR B241	24019439	○
535	585	22	560	543	13	80 NBR B241	24056753	○
540	585	18	562,5	547	13	80 NBR B241	24030244	○
540	590	22	565	548	13	80 NBR B241	24224493	○
550	600	23,5	575	558	13	80 NBR B241	24019440	○
560	610	22	585	568	13	80 NBR B241	24019441	○
565	615	22	590	573	13	80 NBR B241	24083897	○
570	620	22	595	578	13	80 NBR B241	24019442	○
580	630	22	605	588	13	80 NBR B241	24019443	○
585	635	22	610	593	13	80 NBR B241	24074892	○
590	640	22	615	598	13	80 NBR B241	24098918	○
600	650	22	625	608	13	80 NBR B241	24083894	○
600	650	22	625	608	13	80 NBR B241	24377650	○
600	660	30	630	610	13	80 NBR B241	24209235	○
610	674	25	642	620	13	80 NBR B241	24019445	○
620	684	25	652	630	13	80 NBR B241	24019446	○
625	655	20	640	630	13	80 NBR B241	24069422	○
636	692	30,5	664	646	13	80 NBR B241	24019447	○
640	684	20	662	647	13	80 NBR B241	24019448	○
640	704	25	672	650	13	80 NBR B241	24079885	○
660	704	20	682	667	13	80 NBR B241	24079888	○
660,4	711,2	25,4	685,8	668,4	13	80 NBR B241	24019449	○
670	734	25	702	680	13	80 NBR B241	24019450	○
680	730	20	705	688	13	80 FKM K670	24335413	○
680	730	20	705	688	13	80 NBR B241	24056485	○
685	737	22	711	693	13	80 NBR B241	24288861	○
690	740	22	715	698	13	80 NBR B241	24109964	○
690	754	25	722	700	13	80 NBR B241	24060652	○
698,5	749,3	22,2	723,9	706,5	13	80 NBR B241	24019451	○
700	764	25	732	710	13	80 NBR B241	24086435	○
710	760	20	735	718	13	80 NBR B241	24080021	○
730	770	20	750	737	13	80 NBR B241	24214616	○
730	794	25	762	740	13	80 NBR B241	24019452	○
735	799	25	767	745	13	80 NBR B241	24019453	○
750	810	25	780	760	13	80 NBR B241	24058322	○
760	800	20	780	767	13	80 NBR B241	24114592	○
760	804	20	782	767	13	80 NBR B241	24027238	○
760	820	25	790	770	13	80 NBR B241	24257072	○
770	834	25	802	780	13	80 NBR B241	24019454	○
776	820	20	798	783	13	80 FKM K670	24335414	○
780	844	25	812	790	13	80 NBR B241	24030498	○
799	860	26	829,5	809	13	80 NBR B241	24023846	○
800	864	25	832	810	13	80 NBR B241	24019456	○
805	869	25	837	815	16	80 NBR B241	24019457	○
830	894	25	862	840	16	80 NBR B241	24130473	○
835	899	25	867	845	16	80 NBR B241	24019458	○
840	904	25	872	850	16	80 NBR B241	24078229	○
860	920	25	890	870	16	80 NBR B241	24130477	○
860	924	25	892	870	16	80 NBR B241	24063681	○
880	940	30	910	890	16	80 NBR B241	24209239	○

● Available from stock ○ On request: Tool is available, delivery at short notice



Width	D	L	D ₁	D ₂	C	Material	Article No.	
880	944	25	912	890	16	80 NBR B241	24019459	○
890	954	25	922	900	16	80 NBR B241	24023847	○
900	960	27	930	910	16	80 NBR B241	24177298	○
910	974	25	942	920	16	80 NBR B241	24019460	○
930	994	25	962	940	16	80 NBR B241	24027236	○
950	1014	25	982	960	16	80 NBR B241	24266520	○
955	1019	25	987	965	16	80 NBR B241	24300376	○
970	1034	25	1002	980	16	80 NBR B241	24019462	○
1000	1060	30	1030	1010	16	80 NBR B241	24209243	○
1000	1064	25	1032	1010	16	80 NBR B241	24109960	○
1020	1084	25	1052	1030	16	80 NBR B241	24019464	○
1060	1124	25	1092	1070	16	80 NBR B241	24121892	○
1110	1174	25	1142	1120	16	80 NBR B241	24060654	○
1130	1194	25	1162	1140	16	80 NBR B241	24065116	○
1175	1239	25	1207	1185	16	80 NBR B241	524751	○
1200	1264	25	1232	1210	16	80 NBR B241	24027475	○
1435	1499	25	1467	1445	20	80 NBR B241	24121165	○
1480	1544	25	1512	1490	20	80 NBR B241	24052248	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Simmerring Radiamatic® R 36

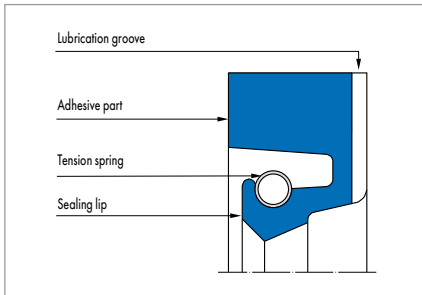


Fig. 1 Simmerring Radiamatic® R 36

Product description

Simmerring with a fabric reinforced static part that is securely joined to the elastomer sealing lip. The sealing lip is also pre-loaded with a garter spring.

Product advantages

Sealing ring is used, in case of adequate lubrication by the medium to be sealed, preferably where shafts pass through walls in mills and large gearboxes in heavy machinery manufacture.

- Particularly robust static part
- Lasting radial contact pressure
- Highly wear-resistant
- With design measures, e.g., metal support for the sealing lip, higher pressures are possible
- Overpressure requires the usage of endless seals
- Back-up ring drawings and installation instructions for open seals are available.

Application

Mills, ship building, steel hydraulics engineering, wind power plants.

Material

Sealing lip	Static part	Tension spring
80 NBR B241	Impregnated cotton fabric B4 B248	ST 1.4571
80 FKM K670	Impregnated aramide fabric	ST 1.4571
75 HNBR U467	Impregnated aramide fabric C2 U464	ST 1.4571

Operating conditions

Material	80 NBR B241	80 FKM K670	75 HNBR U467
	Temperature range in °C		
Mineral oils	-30 ... +100	-10 ... +180	-20 ... +140
Water	+5 ... +100	+5 ... +80	+5 ... +100
Lubricating greases	-30 ... +100	-10 ... +180	-20 ... +140
Rolling oil emulsion	on enquiry		
Pressure p in MPa	0,05		
Running speed v in m/s	20	25	250

Other media on enquiry. Application parameters are recommended values, do not utilise all parameters simultaneously.

Surface quality

Peak-to-valley heights	R _a	R _{max}
Running surface	≤0,6 µm	≤2,5 µm
Housing	≤4 µm	≤15 µm

The contact area is machined by plunge grinding, i.e. without feed. The surface hardness must be approx. 60 HRC (depth of hardening min. 0,5 mm). With increasing circumferential speed the contact area should be manufactured with increasing peak-to-valley heights R_a. The surface should not be too smooth so that an adequate film of lubricant can form. Recommended value: R_{a min} = 0,1 µm. Percentage contact area M_r >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

Design notes

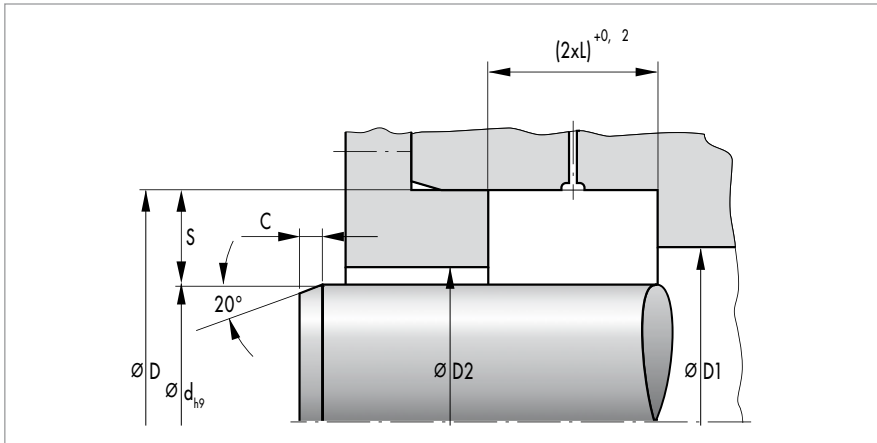


Fig. 2

Lead-in chamfers

See dimension "C" in the article list.

Tolerances

D	Tolerance
<500	H8
>500	+0,0004 x D

Overall eccentricity

The permissible overall eccentricity (static and dynamic eccentricity) between shaft and housing is dependent on the seal profile and circumferential speed. If necessary, we will provide recommended values.

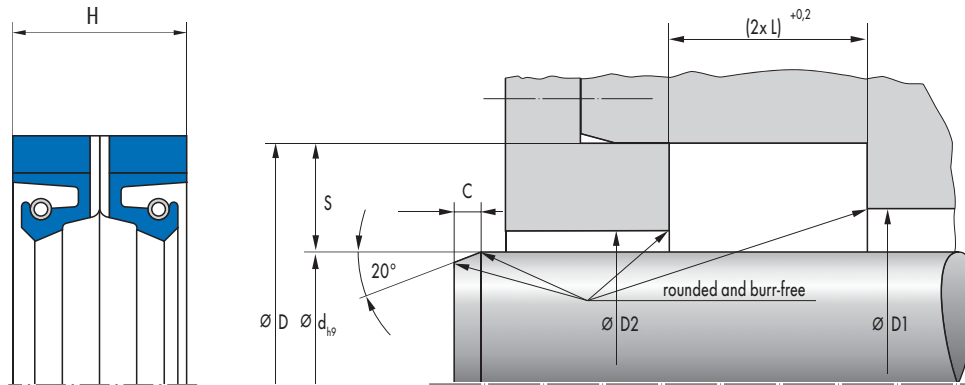
Housing recommendations for new designs

d	S (Profile)	L
>100	20	16
>250	22	20
<450	25	22
>750	32	25

Fitting & installation

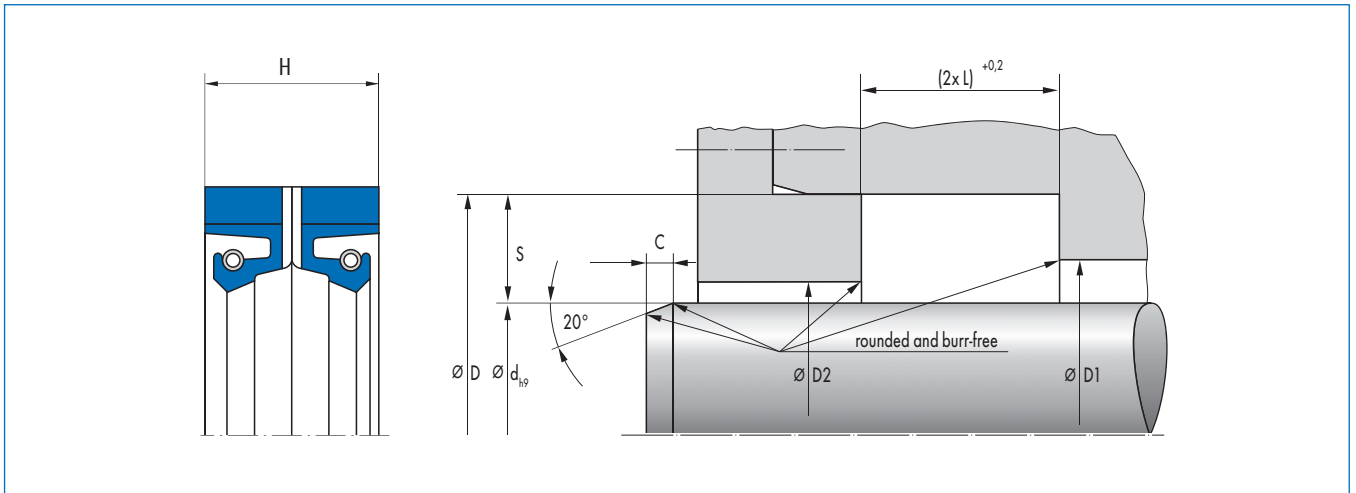
For Simmerring Radiamatic R 36 an axially accessible housing is necessary, as the rings must have low inclination. The Radiamatic R 36 rings are supplied with oversize seal width. For reliable function the Radiamatic R rings must be axially compressed to the dimension "L". An open housing with cover plate and tightening screws is necessary. Specific deformation forces are necessary for the compression. The cover plate and the tightening screws are to be designed appropriately. Please request recommended values.

Article list



Width	D	L	D ₁	D ₂	C	Material	Article No.	
156	196	16	176	163	8	80 NBR B241	24060486	○
200	240	16	220	207	8	80 NBR B241	24292849	○
220	260	16	240	227	10	80 NBR B241	24145056	○
260	290	16	275	265	10	80 NBR B241	24019466	○
275	319,5	19	297,25	282	10	80 NBR B241	24120742	○
280	320	16	300	287	10	80 NBR B241	24119507	○
320	355	16	337,5	325	10	80 NBR B241	24019468	○
330	374	20	352	337	10	80 NBR B241	24088367	○
335	375	15	355	342	10	80 NBR B241	24060450	○
350	394	20	372	357	10	80 NBR B241	24099447	○
380	424	20	402	387	10	80 NBR B241	24019469	○
400	440	21,9	420	407	10	80 NBR B241	24136768	○
400	450	22	425	408	10	80 NBR B241	24054744	○
400,1	438,2	19,1	419,15	405,1	10	80 NBR B241	24019470	○
430	480	22	455	438	10	80 NBR B241	24019471	○
445	495	22	470	453	10	80 NBR B241	24019472	○
460	510	22	485	468	10	80 NBR B241	24019473	○
470	520	22	495	478	10	80 NBR B241	24019474	○
515	565	22	540	523	13	80 NBR B241	24019475	○
570	620	22	595	578	13	80 NBR B241	24054745	○
592	642	22	617	600	13	80 NBR B241	24019476	○
610	660	22	635	618	13	80 NBR B241	24077194	○
625	689	25	657	635	13	80 NBR B241	24054746	○
650	700	22	675	658	13	80 NBR B241	24019477	○
650	714	25	682	660	13	80 NBR B241	24019478	○
676	740	25	708	686	13	80 NBR B241	24019480	○
710	760	25	735	718	13	80 NBR B241	24019481	○
710	774	25	742	720	13	80 NBR B241	24095916	○
735	799	25	767	745	13	80 NBR B241	24075431	○
820	884	28	852	830	16	80 NBR B241	24019482	○
830	894	28	862	840	16	80 NBR B241	24019483	○
835	894	28	864,5	845	16	80 NBR B241	24340276	○
840	904	28	872	850	16	80 NBR B241	24056636	○
850	910	25	880	860	16	80 NBR B241	24019484	○
1020	1084	25	1052	1030	16	80 NBR B241	24059867	○

● Available from stock ○ On request: Tool is available, delivery at short notice



Width	D	L	D ₁	D ₂	C	Material	Article No.	
1100	1160	25	1130	1110	16	80 NBR B241	24019487	<input type="radio"/>

● Available from stock ○ On request: Tool is available, delivery at short notice

Simmerring Radiamatic® R 37

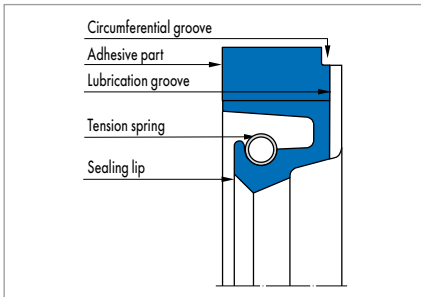


Fig. 1 Simmerring Radiamatic® R 37

Product description

Simmerring with a fabric reinforced static part that is securely joined to the elastomer sealing lip. The sealing lip is also pre-loaded with a garter spring.

Product advantages

Sealing ring is used, in case of adequate lubrication by the medium to be sealed, preferably where shafts pass through walls in mills and large gearboxes in heavy machinery manufacture.

- Particularly robust static part
- Lasting radial contact pressure
- Highly wear-resistant.

Application

Mills, ship building, steel hydraulics engineering, wind power plants.

Material

Sealing lip	Static part	Tension spring
80 NBR B241	Impregnated cotton fabric B4 B248	ST 1.4571
80 FKM K670	Impregnated aramide fabric C2K670	ST 1.4571
75 HNBR U467	Impregnated aramide fabric C2U464	ST 1.4571

Operating conditions

Material	80 NBR B241	80 FKM K670	75 HNBR U467
	Temperature range in °C		
Mineral oils	-30 ... +100	-10 ... +180	-20 ... +140
Water	+5 ... +100	+5 ... +80	+5 ... +100
Lubricating greases	-30 ... +100	-10 ... +180	-20 ... +140
Rolling oil emulsion	on enquiry		
Pressure p in MPa	0,05		
Running speed v in m/s	20	25	250

Other media on enquiry. Application parameters are recommended values, do not utilise all parameters simultaneously.

Surface quality

Peak-to-valley heights	R_a	R_{max}
Running surface	$\leq 0,6 \mu\text{m}$	$\leq 2,5 \mu\text{m}$
Housing	$\leq 4 \mu\text{m}$	$\leq 15 \mu\text{m}$

The contact area is machined by plunge grinding, i.e. without feed. The surface hardness must be approx. 60 HRC (depth of hardening min. 0,5 mm). With increasing circumferential speed the contact area should be manufactured with increasing peak-to-valley heights R_a . The surface should not be too smooth so that an adequate film of lubricant can form. Recommended value: $R_{a \text{ min}} = 0,1 \mu\text{m}$. Percentage contact area $M_t > 50\%$ to max. 90% at cutting depth $c = Rz/2$ and reference line $C_{\text{ref}} = 0\%$. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

Design notes

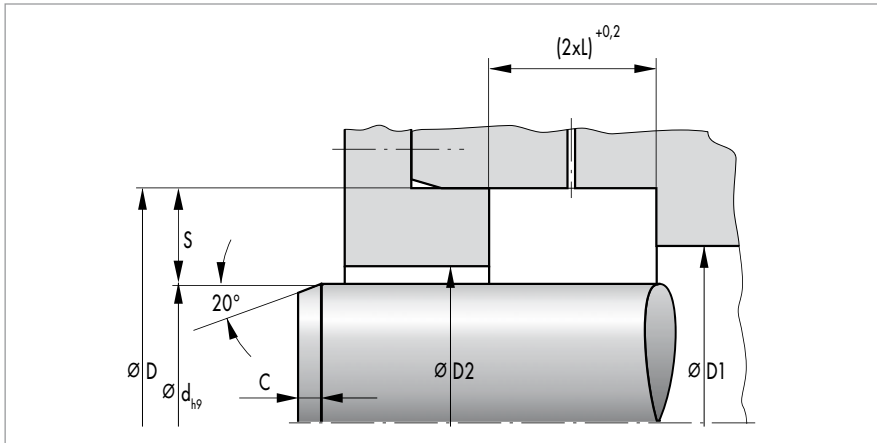


Fig. 2

Lead-in chamfers

See dimension "C" in the article list.

Tolerances

D	Tolerance
<500	H8
>500	+0,0004 x D

Overall eccentricity

The permissible overall eccentricity (static and dynamic eccentricity) between shaft and housing is dependent on the seal profile and circumferential speed. If necessary, we will provide recommended values.

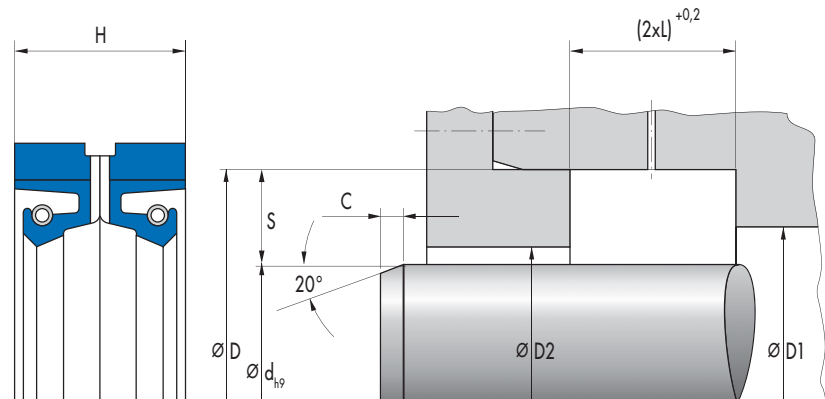
Housing recommendations for new designs

d	S (Profile)	L
>100	20	16
>250	22	20
<450	25	22
>750	32	25

Fitting & installation

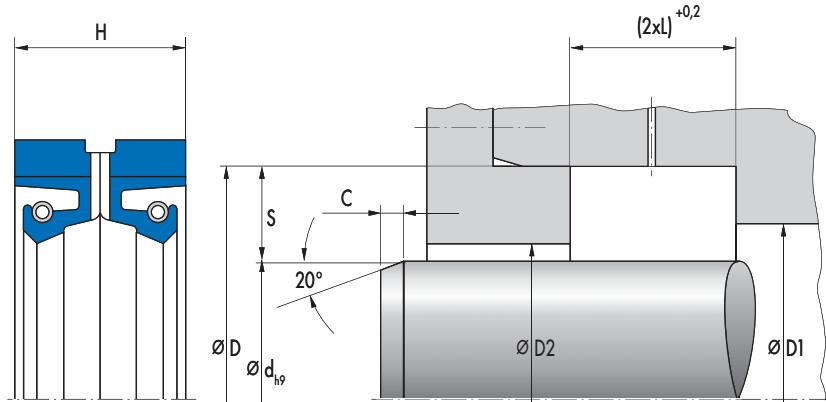
For Simmerring Radiamatic R 37 an axially accessible housing is necessary, as the rings must have low inclination. The Radiamatic R 37 rings are supplied with oversize seal width. For reliable function the Radiamatic R rings must be axially compressed to the dimension "L". An open housing with cover plate and tightening screws is necessary. Specific deformation forces are necessary for the compression. The cover plate and the tightening screws are to be designed appropriately. Please request recommended values.

Article list



Width	D	L	D ₁	D ₂	C	Material	Article No.	
101,6	133,3	11,9	117,45	106,6	8	80 NBR B241	24019488	○
127	158,8	12,3	142,9	134	8	80 NBR B241	24084424	○
127	158,8	12,5	142,9	134	8	80 FKM K670	24316571	○
132,5	172,5	16	152,5	139,5	8	80 NBR B241	24102306	○
133	165	12,5	149	138	8	80 NBR B241	24029891	○
160	190	14,3	175	165	10	80 NBR B241	24233697	○
160	200	18	180	167	10	80 NBR B241	24019489	○
170	200	13	185	175	10	80 NBR B241	24039649	○
170	210	18	190	177	10	80 NBR B241	24128280	○
175	205	14,5	190	180	10	80 NBR B241	24242046	○
175	215	16	195	182	10	80 NBR B241	24027243	○
180	210	14	195	185	10	80 NBR B241	24051648	○
185	225	16	205	192	10	80 FKM K670	24264958	○
195	225	14,5	210	200	10	80 NBR B241	24242055	○
200	230	14	215	205	10	80 FKM K670	24292790	○
200	230	14	215	205	10	80 NBR B241	24051248	○
220	250	16	235	225	10	80 NBR B241	24051448	○
220	260	16	240	227	10	80 NBR B241	24035849	○
230	260	16	245	235	10	80 NBR B241	24234870	○
230	270	16	250	237	10	80 NBR B241	24181867	○
230	280	22,5	255	238	10	80 NBR B241	24019490	○
235	265	15	250	240	10	80 NBR B241	24339504	○
245	285	16	265	252	10	80 NBR B241	24352034	○
250	280	16	265	255	10	80 NBR B241	24051548	○
250	290	16	270	257	10	80 NBR B241	24035749	○
260	300	14	280	267	10	80 NBR B241	24051348	○
270	310	18	290	277	10	80 NBR B241	24030228	○
275	315	18	295	282	10	80 NBR B241	24142291	○
290	334	20	312	297	10	80 NBR B241	24052348	○
292,1	330,2	19,4	312,65	299,1	10	80 NBR B241	24180004	○
300	340	16	320	307	10	80 NBR B241	24230747	○
300	344	20	322	307	10	80 NBR B241	24055100	○
320	360	17,7	340	327	10	80 NBR B241	24141749	○
320	364	20	342	327	10	80 NBR B241	24237636	○
325	375	22,5	350	333	10	80 NBR B241	24019493	○

● Available from stock ○ On request: Tool is available, delivery at short notice



Width	D	L	D ₁	D ₂	C	Material	Article No.	
330	374	20	352	337	10	80 NBR B241	24143075	○
330,2	368,3	22,2	349,25	337,2	10	80 NBR B241	24170623	○
345	389	20	367	352	10	80 NBR B241	24143071	○
350	394	20	372	357	10	80 NBR B241	24264183	○
350	394	20	372	357	10	80 FKM K670	24292794	○
360	404	20	382	367	10	80 NBR B241	24090860	○
370	414	20	392	377	10	80 NBR B241	24183874	○
370	414	20	392	377	10	80 FKM K670	24302799	○
380	424	20	402	387	10	80 NBR B241	24143083	○
387	431	22	409	394	10	80 NBR B241	24019494	○
395	439	22	417	402	10	80 NBR B241	24030420	○
400	444	20	422	407	10	80 NBR B241	24090862	○
400	450	22	425	408	10	80 NBR B241	24085941	○
420	470	22	445	428	10	80 NBR B241	24019496	○
430	480	22	455	438	10	80 NBR B241	24019497	○
435	485	22	460	443	10	80 NBR B241	24080564	○
440	490	28	465	448	10	80 NBR B241	24080542	○
445	485	18	465	452	10	80 NBR B241	24316607	○
446	486	16	466	453	10	80 NBR B241	24055680	○
454	504,8	21	479,4	462	10	80 NBR B241	24023848	○
455	505	25	480	463	10	80 NBR B241	24019499	○
470	520	22	495	478	10	80 NBR B241	24030349	○
480	530	22	505	488	10	80 NBR B241	24346715	○
480	530	25	505	488	10	80 NBR B241	24019500	○
500	545	20	522,5	507	10	80 NBR B241	24073136	○
500	550	22	525	508	10	80 FKM K670	24351569	○
500	550	22	525	508	10	80 NBR B241	24029886	○
530	580	22	555	538	13	80 FKM K670	24330883	○
530	580	22	555	538	13	80 NBR B241	24079020	○
535	585	22	560	543	13	80 NBR B241	24377408	○
540	590	22	565	548	13	80 NBR B241	24027244	○
540	590	25	565	548	13	80 NBR B241	24019502	○
560	604	20	582	567	13	80 NBR B241	24019503	○
560	610	22	585	568	13	80 FKM K670	24142097	○
565	615	22	590	573	13	80 NBR B241	24377407	○
580	630	22	605	588	13	80 NBR B241	24241448	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Width	D	L	D ₁	D ₂	C	Material	Article No.	
590	640	22	615	598	13	80 NBR B241	24029885	○
596	652	29,5	624	606	13	80 NBR B241	24030419	○
600	650	22	625	608	13	80 NBR B241	24092311	○
609,6	660,4	22	635	617,6	13	80 NBR B241	24183145	○
616	666,8	22	641,4	624	13	80 NBR B241	24296689	○
620	684	25	652	630	13	80 NBR B241	24173794	○
640	684	20	662	647	13	80 NBR B241	24019505	○
650	714	25	682	660	13	80 NBR B241	24019506	○
660	700	18	680	667	13	80 NBR B241	24147946	○
670	714	22	692	677	13	80 NBR B241	24019507	○
680	730	22	705	688	13	80 NBR B241	24143002	○
685,8	749,3	25	717,55	695,8	13	80 NBR B241	24179979	○
700	750	25	725	708	13	80 NBR B241	24144899	○
710	760	25	735	718	13	80 NBR B241	24030492	○
710	774	25	742	720	13	80 NBR B241	24138786	○
720	780	25	750	730	13	80 NBR B241	24138770	○
720	780	25	750	730	13	80 FKM K670	24335751	○
735	799	25	767	745	13	80 FKM K670	24335411	○
750	814	25	782	760	13	80 NBR B241	24239267	○
750	814	28	782	760	13	80 NBR B241	24019508	○
760	804	20	782	767	13	80 NBR B241	24092067	○
775	839	25	807	785	13	80 NBR B241	24078227	○
780	820	17,7	800	787	13	80 NBR B241	24141753	○
780	844	25	812	790	13	80 NBR B241	24102054	○
800	864	25	832	810	13	80 NBR B241	24139749	○
810	874	25	842	820	16	80 NBR B241	24019509	○
820	870	25	845	828	16	80 NBR B241	24138778	○
860	920	22	890	870	16	80 FKM K670	24260998	○
860	920	22	890	870	16	80 NBR B241	24019510	○
870	930	27	900	880	16	80 NBR B241	24077687	○
870	934	25	902	880	16	80 NBR B241	24030422	○
880	944	25	912	890	16	80 NBR B241	24039949	○
970	1030	21,5	1000	980	16	80 NBR B241	24019511	○
985	1045	24,5	1015	995	16	80 NBR B241	24066979	○
1080	1140	25	1110	1090	16	80 FKM K670	24335407	○
1220	1284	25	1252	1230	20	80 NBR B241	24060650	○
1250	1314	25	1282	1260	20	80 FKM K670	24215196	○
1250	1314	25	1282	1260	20	80 NBR B241	24090489	○
1330	1394	25	1362	1340	20	80 NBR B241	24290261	○
1608,5	1670	20	1639,25	1618	20	80 NBR B241	24055983	○
1610	1670	20	1640	1620	20	80 NBR B241	24027477	○
1740	1800	20	1770	1750	20	80 NBR B241	24055944	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Simmerring Radiamatic® R 58

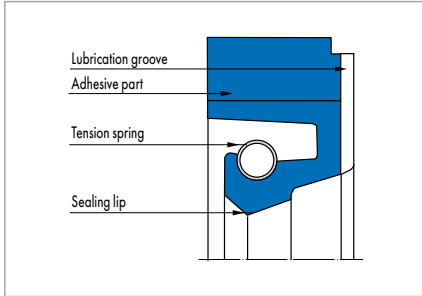


Fig. 1 Simmerring Radiamatic® R 58

Product description

Simmerring with a fabric reinforced static part that is securely joined to the elastomer sealing lip. The sealing lip is also pre-loaded with a garter spring.

Product advantages

The sealing ring has a groove around the circumference to facilitate additional lubrication from the outside. The Simmerring Radiamatic R 58 was developed for the special requirements of grease-lubricated bearings in mill manufacture.

- Particularly robust static part
- Lasting radial contact pressure
- Highly wear-resistant.

Application

Mills.

Material

Sealing lip	Static part	Tension spring
80 NBR B241	Impregnated cotton fabric B4 B248	ST 1.4571

Other materials on enquiry.

Operating conditions

Material	80 NBR B241
	Temperature range in °C
Mineral oils	-30 ... +100
Water	+5 ... +100
Lubricating greases	-30 ... +100
Rolling oil emulsion	on enquiry
Pressure p in MPa	0,05
Running speed v in m/s	15

Other media on enquiry. Application parameters are recommended values, do not utilise all parameters simultaneously.

Surface quality

Peak-to-valley heights	R _a	R _{max}
Running surface	≤0,6 µm	≤2,5 µm
Housing	≤4 µm	≤15 µm

The contact area is machined by plunge grinding, i.e. without feed. The surface hardness must be approx. 60 HRC (depth of hardening min. 0,5 mm). With increasing circumferential speed the contact area should be manufactured with increasing peak-to-valley heights R_a. The surface should not be too smooth so that an adequate film of lubricant can form. Recommended value: R_{a min} = 0,1 µm. Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

Design notes

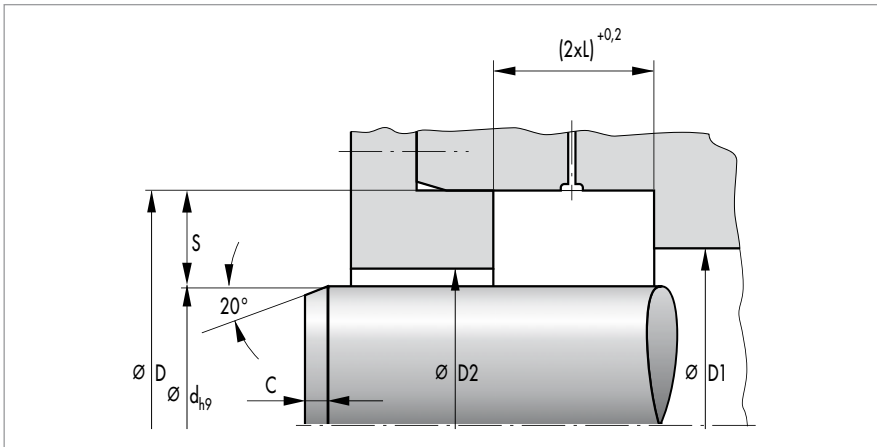


Fig. 2

Lead-in chamfers

See dimension "C" in the article list.

Tolerances

D	Tolerance
<500	H8
>500	+0,0004 x D

Overall eccentricity

The permissible overall eccentricity (static and dynamic eccentricity) between shaft and housing is dependent on the seal profile and circumferential speed. If necessary, we will provide recommended values.

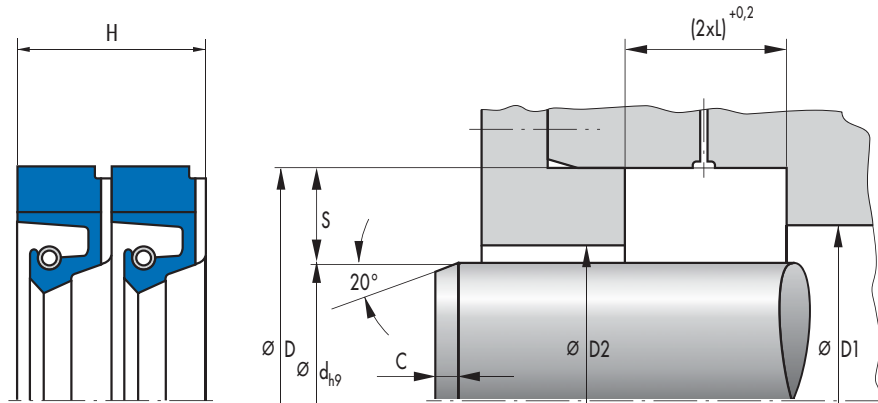
Housing recommendations for new designs

d	S (Profile)	L
>100	20	16
>250	22	20
<450	25	22
>750	32	25

Fitting & installation

For Simmerring Radiamatic R 58 an axially accessible housing is necessary, as the rings must have low inclination. The Radiamatic R 58 rings are supplied with oversize seal width. For reliable function the Radiamatic R rings must be axially compressed to the dimension "L". An open housing with cover plate and tightening screws is necessary. Specific deformation forces are necessary for the compression. The cover plate and the tightening screws are to be designed appropriately. Please request recommended values.

Article list



Width	D	L	D ₁	D ₂	C	Material	Article No.	
345	389	20	367	352	10	80 NBR B241	24330193	○
360	404	20	382	367	10	80 NBR B241	24349035	○
400	444	20	422	407	10	80 NBR B241	24349036	○
430	480	22	455	438	10	80 NBR B241	24349033	○
435	485	22	460	443	10	80 NBR B241	24313903	○
440	480	20	465	438	10	80 NBR B241	24351547	○
440	490	28	465	448	10	80 NBR B241	24330194	○
455	505	22	480	463	10	80 NBR B241	24378064	○
455	505	22	480	463	10	75 NBR B244	24346279	○
480	530	25	505	488	10	80 NBR B241	24313904	○
485	535	22	510	493	10	80 NBR B241	24313920	○
500	550	22	525	508	10	80 NBR B241	24315279	○
525	575	22	550	533	13	80 NBR B241	24313919	○
530	580	22	555	538	13	80 NBR B241	24315505	○
550	600	22	575	558	13	80 NBR B241	24315506	○
560	604	20	582	567	13	80 NBR B241	24349034	○
560	610	22	585	568	13	80 NBR B241	24315507	○
620	684	25	652	630	13	80 NBR B241	24315278	○
750	814	28	782	760	13	80 NBR B241	24315280	○
880	944	25	912	890	16	80 NBR B241	24315287	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Simmerring Radiamatic® R 35 LD

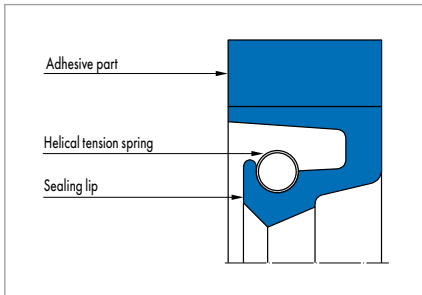


Fig. 1 Simmerring Radiamatic® R 35 LD

Product description

Simmerring with a fabric reinforced static part that is securely joined to the elastomer sealing lip. The sealing lip is also pre-loaded with a garter spring.

Product advantages

Sealing ring is used, in case of adequate lubrication by the medium to be sealed, preferably where shafts pass through walls in mills and large gearboxes in heavy machinery manufacture.

- Particularly robust static part
- Lasting radial contact pressure
- Highly wear-resistant.

Higher pressures are possible with design measures, e.g. metal support for the sealing lip. Overpressure requires the usage of endless seals. Back-up ring drawings and installation instructions for open seals are available.

Application

Mills, ship building.

Material

Sealing lip	Static part	Tension spring
80 NBR B241	Impregnated cotton fabric B4 B248	ST 1.4571
70 HNBR U467	Impregnated cotton fabric C2 U464	ST 1.4571

Operating conditions

Material	80 NBR B241	75 HNBR U467
	Temperature range in °C	
Mineral oils	-30 ... +100	-20 ... +140
Water	+5 ... +100	+5 ... +100
Lubricating greases	-30 ... +100	-20 ... +140
Rolling oil emulsion	on enquiry	
Pressure p in MPa	0,05	
Running speed v in m/s	20 (NBR), 25 (HNBR)	

Other media on enquiry. Application parameters are recommended values, do not utilise all parameters simultaneously.

Surface quality

Peak-to-valley heights	R_a	R_{max}
Running surface	$\leq 0,6 \mu\text{m}$	$\leq 2,5 \mu\text{m}$
Housing	$\leq 4,0 \mu\text{m}$	$\leq 15,0 \mu\text{m}$

The contact area is machined by plunge grinding, i.e. without feed. The surface hardness must be approx. 60 HRC (depth of hardening min. 0,5 mm). With increasing circumferential speed the contact area should be manufactured with increasing peak-to-valley heights R_a . The surface should not be too smooth so that an adequate film of lubricant can form. Recommended value: $R_{a \text{ min}} = 0,1 \mu\text{m}$. Percentage contact area $M_p > 50\%$ to max. 90% at cutting depth $c = Rz/2$ and reference line $C \text{ ref} = 0\%$. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

Design notes

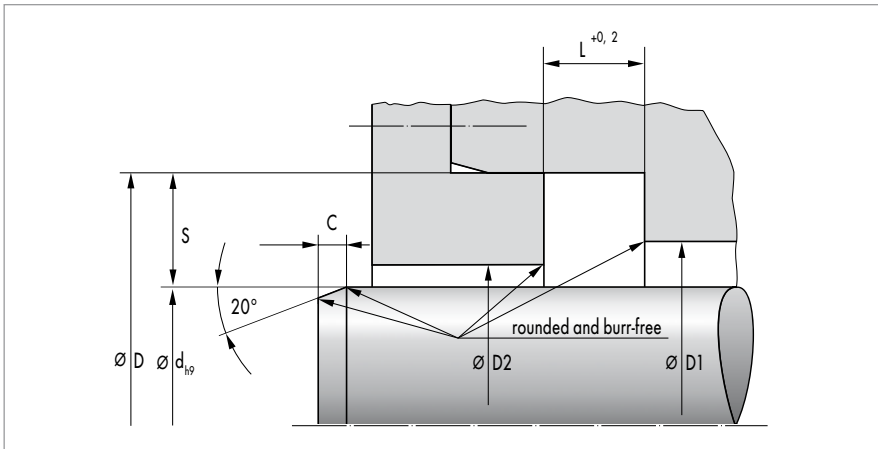


Fig. 2

Available dimensions

Profile S x L	Ø range
32 x 25	d > 1100 ... 3000

Simmerring Radiamatic® RS 85

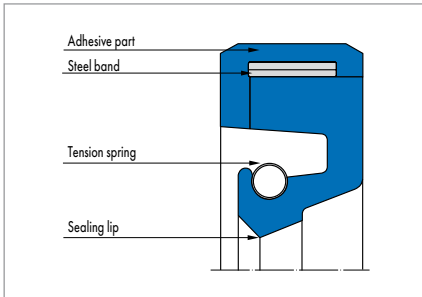


Fig. 1 Simmerring Radiamatic® RS 85

Product description

Self-holding Simmerring made from two functionally suitable elastomer components and an integrated steel strip. The tension springs support the radial contact pressure on the shaft.

Product advantages

Self-holding Simmerring for shaft pass through walls in heavy machinery manufacture.

- Long-lasting tight fit
- Lasting radial contact pressure
- Highly wear-resistant.

An axially accessible housing is necessary for the fitting. The non-pressurised side of the sealing ring is to be reinforced for pressurisation. In the unpressurised state, an axial reinforcement on the non-pressurised side is not necessary. Only endless self-holding Simmerrings Radiamatic RS 85 are available.

Application

Rolling mills, large gearboxes.

Material

Sealing lip	Static part	Steel strip	Tension spring
80 NBR B241	85 NBR B247	ST 1.4310	ST 1.4571
75 HNBR U467	85 HNBR 10040	ST 1.4310	ST 1.4571
80 FKM K670	90 FKM K683	ST 1.4310	ST 1.4571

Operating conditions

Material	80 NBR B241	75 HNBR U467	80 FKM K670
	Temperature range in °C		
Mineral oils	-30 ... +100	-20 ... +140	-10 ... +180
Water	+5 ... +100	+5 ... +100	+5 ... +80
Lubricating greases	-30 ... +100	-20 ... +140	-10 ... +180
Rolling oil emulsion	on enquiry		
Pressure p in MPa	0,05		
Running speed v in m/s	20	25	25

Other media on enquiry. Application parameters are recommended values, do not utilise all parameters simultaneously.

Surface quality

Peak-to-valley heights	R_a	R_{max}
Running surface	$\leq 0,6 \mu\text{m}$	$\leq 2,5 \mu\text{m}$
Housing	$\leq 4,0 \mu\text{m}$	$\leq 15,0 \mu\text{m}$

The contact area is machined by plunge grinding, i.e. without feed. The surface hardness must be approx. 60 HRC (depth of hardening min. 0,5 mm). With increasing circumferential speed, the contact area should be manufactured with increasing peak-to-valley heights $R_{z\alpha}$. The surface should not be too smooth so that an adequate film of lubricant can form. Recommended value: $R_{a\min} = 0,1 \mu\text{m}$. Percentage contact area $M_r > 50\%$ to max. 90% at cutting depth $c = Rz/2$ and reference line $C_{ref} = 0\%$. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

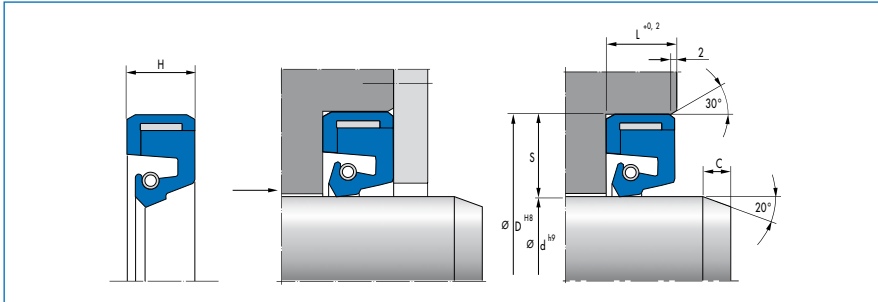
Design notes

Please observe our general design notes in → Technical Manual.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal. → Technical Manual.

Housing recommendations for new designs



Ø d	S (Profile)	L	a
200 ... 450	20	20	4
	22	20	4
>450 ... 750	22	22	4
	25	22	4
>750	25	25	5
	30	25	5
	32	25	5

Lead-in chamfer

Ø d	c
<200	8
>200 ... 500	10
>500 ... 800	13
>800 ... 1200	16
>1200	20

Simmerring Radiamatic® RHS 51

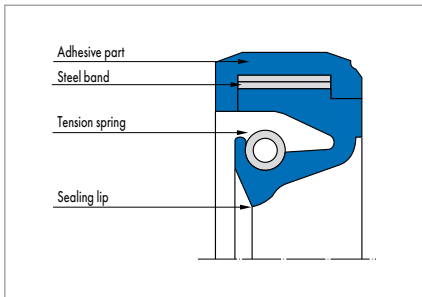


Fig. 1 Simmerring Radiamatic® RHS 51

Product description

High-speed Simmerring made from two functionally suitable elastomer components and an integrated steel strip. Two interleaved tension springs ensure an even radial force over the entire circumference length of the sealing edge even with high shaft centre offset.

Product advantages

Self-holding Simmerring for shaft pass through walls in mills and large gearboxes in heavy machinery manufacture. The sealing ring has radial grooves to facilitate additional lubrication from outside. Only endless self-holding Simmerrings are available

- Long-lasting tight fit
- Lasting radial contact pressure
- Highly wear-resistant
- High permissible shaft offset
- High permissible circumferential speed.

Application

Rolling mills, large gearboxes.

Material

Sealing lip	Static part	Steel strip	Tension spring
80 NBR B241	85 NBR B247	ST 1.4310	ST 1.4571
75 HNBR U467	85 HNBR 10040	ST 1.4310	ST 1.4571
80 FKM K670	90 FKM K683	ST 1.4310	ST 1.4571

Operating conditions

Material	80 NBR B241	75 HNBR U467	80 FKM K670
	Temperature range in °C		
Mineral oils	-30 ... +100	-20 ... +120	-10 ... +150
Water	+5 ... +100	+5 ... +100	+5 ... +80
Lubricating greases	-30 ... +100	-20 ... +120	-10 ... +150
Rolling oil emulsion	on enquiry		
Pressure p in MPa	0,02		
Running speed v in m/s	25	30	35

Other media on enquiry. Application parameters are recommended values, do not utilise all parameters simultaneously.

Surface quality

Peak-to-valley heights	R_a	R_{max}
Running surface	0,15 ... 0,3 μm	$\leq 2,5 \mu\text{m}$
Housing	$\leq 4,0 \mu\text{m}$	$\leq 15,0 \mu\text{m}$

The contact area is machined by plunge grinding, i.e. without feed. The surface hardness must be approx. 60 HRC (depth of hardening min. 0,5 mm). With increasing circumferential speed the contact area should be manufactured with increasing peak-to-valley heights R_a . The surface should not be too smooth so that an adequate film of lubricant can form. Recommended value: $R_{a \min} = 0,1 \mu\text{m}$. Percentage contact area $M_t > 50\%$ to max. 90% at cutting depth $c = Rz/2$ and reference line $C \text{ ref} = 0\%$. Abrasive surfaces, ridges, scratches and blow-holes are to be avoided.

Design notes

The permissible shaft offset (static eccentricity, centre offset) is dependent on the shaft diameter.

Shaft Ø d	Permissible shaft offset
200 ... 320	2,0 mm
>320 ... 450	2,5 mm
>450	3,0 mm

The permissible shaft offset (dynamic eccentricity) is dependent on the seal profile and the circumferential speed. Please request recommended values.

Lead-in chamfer

See dimension "C" in the housing recommendations for new designs.

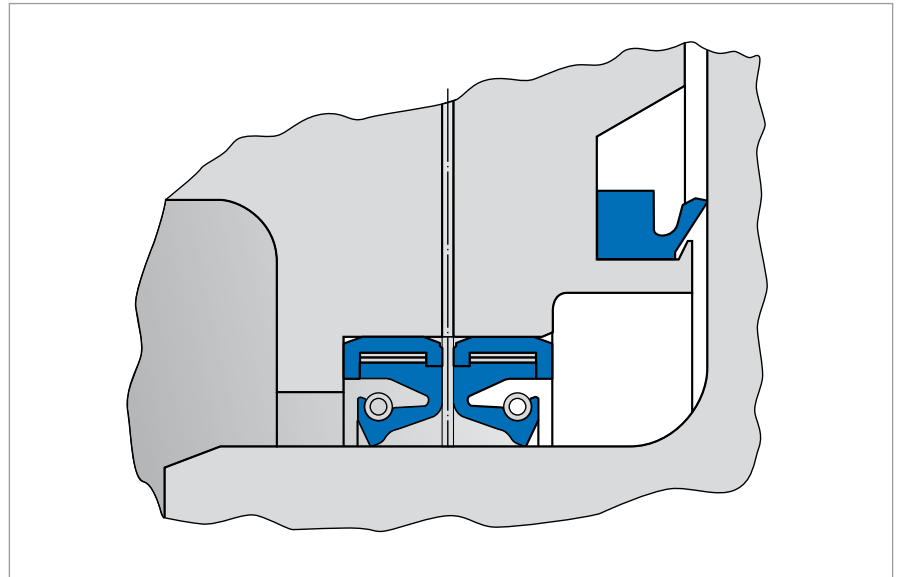
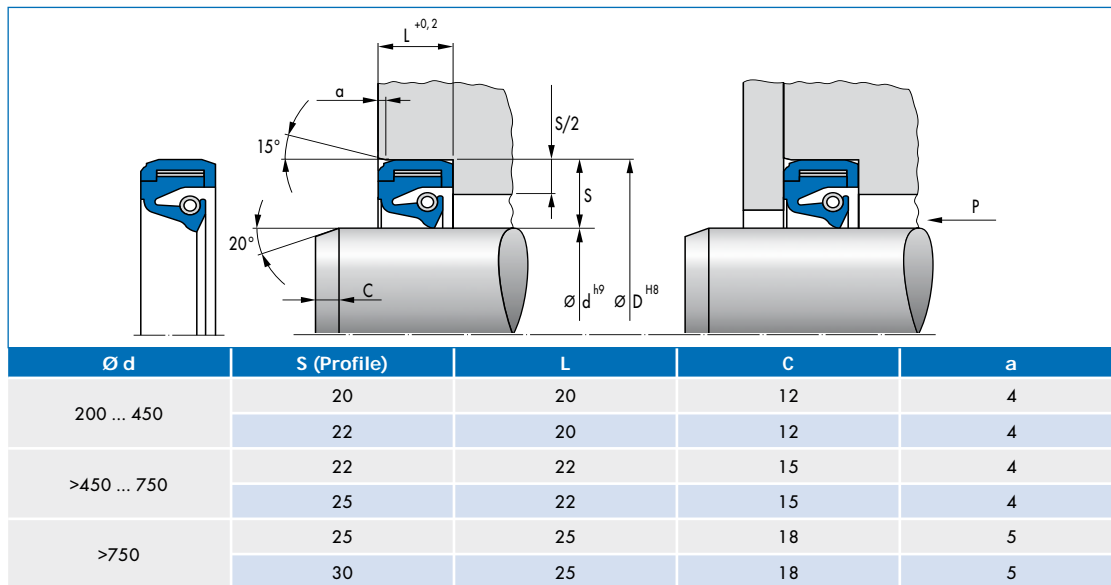


Fig. 2 Typical seal arrangement

Fitting & installation

An axially accessible housing is necessary for the fitting of the Simmerring Radiamatic RHS 51. Only endless self-holding Simmerrings Radiamatic RHS 51 are available.

Housing recommendations for new designs



Merkel U-Ring N 1, AUN 1

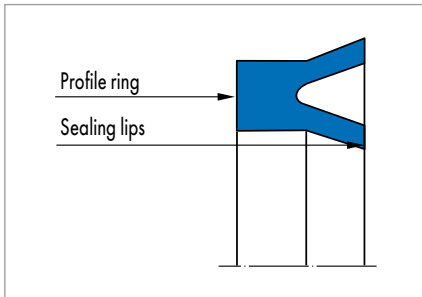


Fig. 1 Merkel U-Ring N 1, AUN 1

Product description

Merkel U-ring with symmetrical profile for rods/pistons.

Product advantages

Single-acting piston or rod seal, preferably for spare parts requirements.

Application

Special cylinders, agricultural machinery, cranes, injection moulding machines, loading platforms, standard cylinders.

Material

N 1

Material	Code	Hardness
Nitrile rubber	90 NBR 109	94 AU 925

AUN 1

Material	Code	Hardness
Polyurethane	94 AU 925	94 Shore A

Operating conditions

Material	90 NBR 109	94 AU 925
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +110
HFA fluids	+5 ... +60	+5 ... +50
HFB fluids	+5 ... +60	+5 ... +50
HFC fluids	-30 ... +60	-30 ... +40
HFD fluids	-	-
Water	+5 ... +90	+5 ... +40
HETG (rapeseed oil)	-30 ... +80	-30 ... +60
HEES (synthetic ester)	-	-30 ... +80
HEPG (glycol)	-30 ... +60	-30 ... +40
Mineral greases	-30 ... +100	-30 ... +110
Pressure p in MPa	10 MPa	20 MPa
Running speed v in m/s	0,5	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

N 1 (material 90 NBR 109)

Profile	Max. permissible gap dimension			
	2,5 MPa	5 MPa	7,5 MPa	10 MPa
≤5,0	0,45	0,35	0,30	0,25
>5,0	0,50	0,40	0,35	0,30

AUN 1 (material 94 AU 925)

Profile	Max. permissible gap dimension			
	5 MPa	10 MPa	20 MPa	10 MPa
≤5,0	0,55	0,40	0,35	0,25
>5,0	0,66	0,45	0,40	0,30

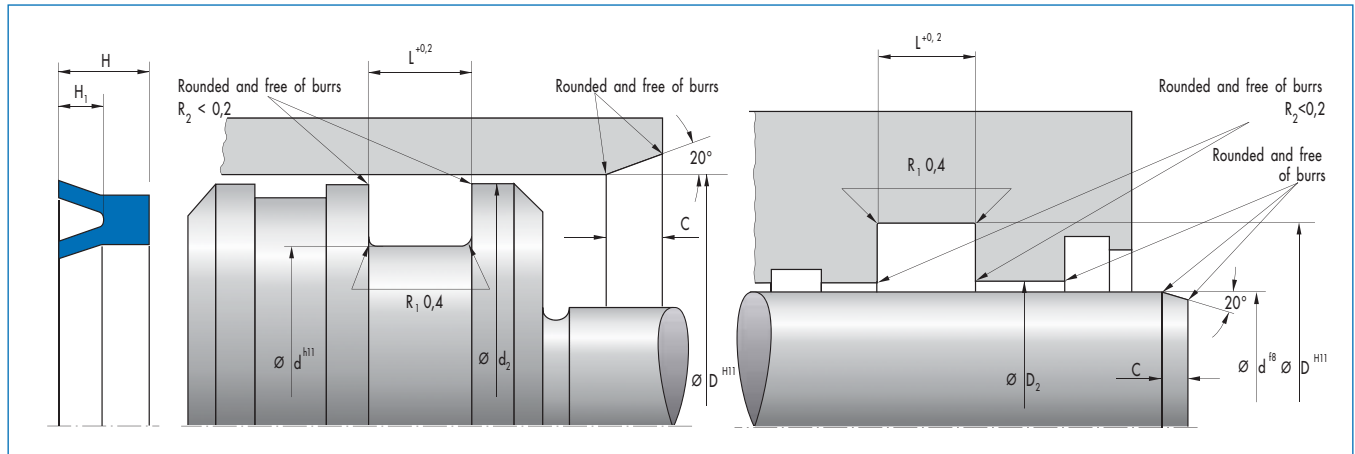
Tolerance recommendation and dimension D2/d2

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D2 (rod seal) or d2 (piston seal). → Technical Manual.

Fitting & installation

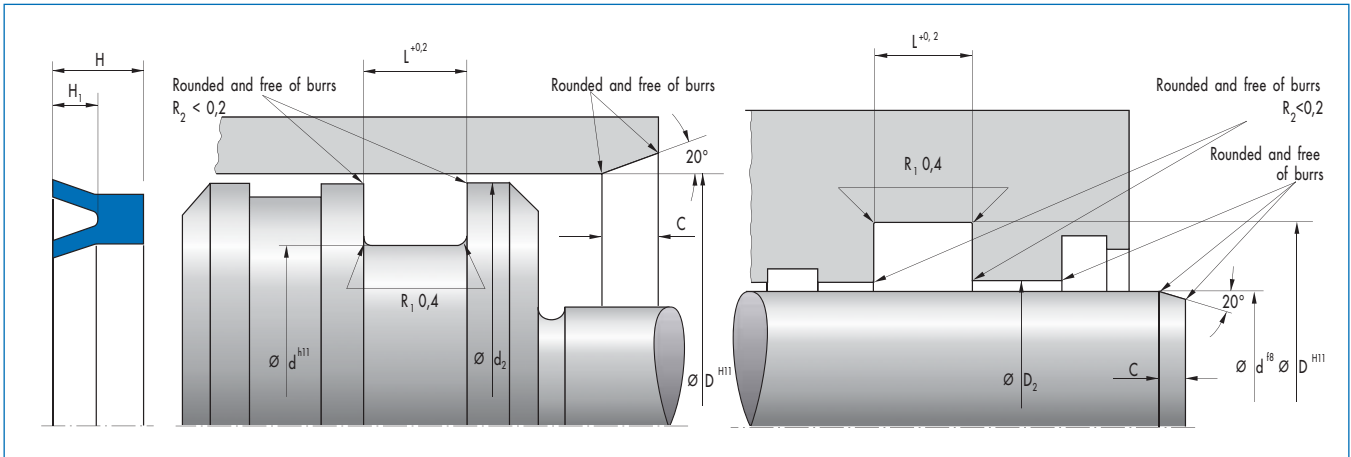
Careful fitting is a prerequisite for the correct function of the seal. → Technical Manual. Note: the use of male adaptors increases the reliability. Further information is available on enquiry.

Article list



d	D	H	H ₁	L	C	Code	Material	Type	Article No.	
2	10	3,8	1,8	4,5	3,5	N2-1	90 NBR M00109	N 1	15946	●
3	7	5	3,5	6	2	N3-2	90 NBR M00109	N 1	15949	●
3	8,5	4	2	4,7	2	N3-1	90 NBR M00109	N 1	15948	●
4	10	4	2	4,7	2,5	AUN4-11	94 AU P00925	AUN 1	13916	●
4	10	4	2	4,7	2,5	N4-1	90 NBR M00109	N 1	15956	●
4	12	4	2	4,7	3,5	N4-2	90 NBR M00109	N 1	15957	●
5	11	5	2,8	6	2,5	N5-8	90 NBR M00109	N 1	15980	●
5	12	5	2,2	6	3	N5-2	90 NBR M00109	N 1	15974	●
5	12	5	3	6	3	AUN5-12	94 AU P00925	AUN 1	14307	●
5	14	4,5	2,3	5,2	4,5	N5-3	90 NBR M00109	N 1	11657	●
5	15	5	2,5	6	4	N5-6	90 NBR M00109	N 1	15977	●
6	12	4	2	4,7	2,5	N6-9	90 NBR M00109	N 1	15999	●
6	12	6	3,5	7	2,5	AUN6-23	94 AU P00925	AUN 1	14401	●
6	12	6	3,5	7	2,5	N6-15	90 NBR M00109	N 1	16007	●
6	15	5	2,5	6	4,5	N6-11	90 NBR M00109	N 1	16001	●
6	15	8	4	9	4,5	AUN6-17	94 AU P00925	AUN 1	11760	●
6	16	5	2,5	6	4	N6-7	90 NBR M00109	N 1	15996	●
6	18	8	4	9	5	N6-2	90 NBR M00109	N 1	15992	●
6	20	8	4	9	5,5	N6-1	90 NBR M00108	N 1	15991	○
6	22	8	3,5	9	6	N6-10	90 NBR M00109	N 1	16000	○
7	14	3,5	1,75	4	3	N7-2	90 NBR M00109	N 1	16020	●
7	15	5	2,5	6	3,5	N7-1	90 NBR M00109	N 1	16019	●
7	15	7	4,5	8	4	AUN7-4	94 AU P00925	AUN 1	13626	●
8	14	4	2	4,7	2,5	N8-12	90 NBR M00109	N 1	16039	●
8	14	6	3	7	2,5	AUN8-31	94 AU P00925	AUN 1	11768	●
8	14	6	3	7	2,5	N8-6	90 NBR M00109	N 1	16033	●
8	15	6	3,8	7	3	N8-2	90 NBR M00109	N 1	16030	●
8	16	4	2	4,7	3,5	N8-13	90 NBR M00109	N 1	16040	●
8	16	6	3	7	3,5	N8-1	90 NBR M00109	N 1	16029	●
8	16	6	3,5	7	4	AUN8-21	94 AU P00925	AUN 1	11766	●
8	17	6	3	7	4,5	N8-17	90 NBR M00109	N 1	16044	●
8	18	8	4,5	9	4,5	N8-15	90 NBR M00109	N 1	16042	●
8	22	8	4	9	5,5	AUN8-20	94 AU P00925	AUN 1	14041	○
8	22	8	4	9	5,5	N8-11	90 NBR M00109	N 1	16037	○
8	25	6	2,5	7	6	AUN8-25	94 AU P00925	AUN 1	13630	○

● Available from stock ○ On request: Tool is available, delivery at short notice

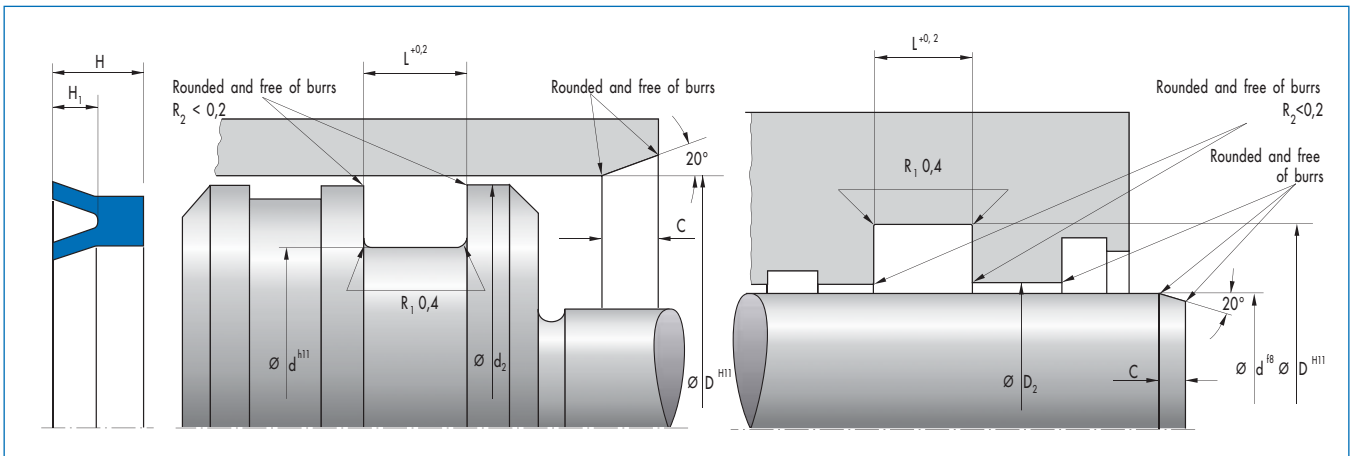


d	D	H	H ₁	L	C	Code	Material	Type	Article No.	
9	17	6	3	7	4	N9-2	90 NBR M00109	N 1	16049	●
10	15	5	2,2	6	2	N10-6	90 NBR M00109	N 1	16062	●
10	15	5	2,5	6	2	N10-22	90 NBR M00109	N 1	16075	●
10	16	4	2	4,7	2,5	N10-17	90 NBR M00109	N 1	16070	●
10	16	5	2,5	6	2,5	N10-37	90 NBR M00109	N 1	16078	●
10	16	6	4	7	2,5	AUN10-33	94 AU P00925	AUN 1	13641	●
10	18	5	2,5	6	4	N10-15	90 NBR M00109	N 1	16068	●
10	18	8	5	9	4	AUN10-31	94 AU P00925	AUN 1	13640	●
10	20	8	4	9	4,5	AUN10-34	94 AU P00925	AUN 1	13642	●
10	22	6	3	7	5	AUN10-30	94 AU P00925	AUN 1	13639	●
10	22	6	3	7	5	N10-8	90 NBR M00109	N 1	16064	●
10	25	6	3	7	5,5	N10-19	90 NBR M00109	N 1	16072	●
10	25	8	4	9	5,5	N10-16	90 NBR M00109	N 1	16069	○
10	26	8	4	9	6	N10-14	90 NBR M00109	N 1	16067	○
10	28	8	3	9	6	N10-1	90 NBR M00109	N 1	16059	○
10	28	9	4	10	6	AUN10-46	94 AU P00925	AUN 1	11780	○
10	30	10	5	11	6	N10-2	90 NBR M00109	N 1	16060	○
10	32	10	5	11	6	N10-26	90 NBR M00109	N 1	16076	○
12	18	4	2	4,7	2,5	N12-17	90 NBR M00109	N 1	16104	●
12	18	5	2	6	2,5	N12-24	90 NBR M00109	N 1	16109	●
12	18	6	4	7	2,5	AUN12-47	94 AU P00925	AUN 1	13658	●
12	20	8	5	9	4	AUN12-39	94 AU P00925	AUN 1	14273	●
12	20	8	5	9	4	N12-66	90 NBR M00109	N 1	18035	●
12	22	5	2,5	6	4,5	AUN12-49	94 AU P00925	AUN 1	13660	○
12	22	5	2,5	6	4,5	N12-34	90 NBR M00109	N 1	16117	●
12	22	7	3	8	4,5	N12-36	90 NBR M00109	N 1	16120	●
12	22	8	5	9	4,5	AUN12-43	94 AU P00925	AUN 1	13655	●
12	24	6	3	7	5	N12-10	90 NBR M00109	N 1	16102	●
12	24	9	6	10	5	AUN12-45	94 AU P00925	AUN 1	14256	●
12	25	8	4	9	5,5	AUN12-41	94 AU P00925	AUN 1	14053	●
12	25	8	4	9	5,5	N12-25	90 NBR M00109	N 1	16110	●
12	26	8	4	9	5,5	N12-6	90 NBR M00108	N 1	16098	●
12	28	10	5	11	6	N12-8	90 NBR M00109	N 1	16100	●
12	30	9	4,5	10	6	AUN12-40	94 AU P00925	AUN 1	14052	○
12	30	9	4,5	10	6	N12-19	90 NBR M00109	N 1	16105	○
12	34	10	5	11	6	N12-30	90 NBR M00109	N 1	16112	○
13	20	3	1,5	3,6	3	N13-10	90 NBR M00109	N 1	16143	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	H ₁	L	C	Code	Material	Type	Article No.	
13	24	6	3	7	4,5	N13-5	90 NBR M00109	N 1	16139	●
13	30	10	5	11	6	N13-2	90 NBR M00108	N 1	16135	○
14	20	4	2	4,7	2,5	N14-8	90 NBR M00109	N 1	16152	●
14	22	4	2	4,7	4	N14-6	90 NBR M00109	N 1	16151	●
14	22	6	3	7	4	N14-12	90 NBR M00109	N 1	16156	●
14	22	6	3,5	7	4	AUN14-21	94 AU P00925	AUN 1	14059	●
14	22	8	4,5	9	4	AUN14-23	94 AU P00925	AUN 1	13667	●
14	22	8	4,5	9	4	N14-11	90 NBR M00109	N 1	16155	●
14	30	8	4	9	6	AUN14-19	94 AU P00925	AUN 1	13664	○
14	30	8	4	9	6	N14-10	90 NBR M00109	N 1	16154	●
14	32	10	5	11	6	N14-4	90 NBR M00108	N 1	16150	○
15	20	3	1,5	3,6	2	N15-11	90 NBR M00109	N 1	16179	●
15	22	4	2	4,7	3	N15-12	90 NBR M00109	N 1	16180	●
15	24	7	3,5	8	4,5	N15-9	90 NBR M00109	N 1	16177	●
15	25	5	2,5	6	4,5	N15-5	90 NBR M00109	N 1	16174	●
15	25	8	5	9	4,5	AUN15-23	94 AU P00925	AUN 1	11797	●
15	28	10	2,5	11	5,5	N15-1	90 NBR M00109	N 1	16172	●
15	30	8	4	9	5,5	AUN15-24	94 AU P00925	AUN 1	13675	○
15	30	8	4	9	5,5	N15-8	90 NBR M00109	N 1	16176	●
15	35	10	5	11	6	N15-2	90 NBR M00108	N 1	16173	○
16	22	4	2	4,7	2,5	AUN16-37	94 AU P00925	AUN 1	11803	●
16	22	4	2	4,7	2,5	N16-19	90 NBR M00109	N 1	16201	●
16	22	6	3	7	2,5	N16-5	90 NBR M00109	N 1	16194	●
16	25	5	2,2	6	4,5	N16-55	90 NBR M00109	N 1	16216	●
16	26	5	2,5	6	4,5	AUN16-40	94 AU P00925	AUN 1	14078	●
16	26	5	2,5	6	4,5	N16-4	90 NBR M00109	N 1	16192	●
16	28	6	3	7	5	AUN16-27	94 AU P00925	AUN 1	13679	●
16	29	6	3	7	5,5	N16-18	90 NBR M00109	N 1	16200	●
16	30	6	3	7	5,5	N16-42	90 NBR M00109	N 1	16207	●
16	32	8	4	9	6	AUN16-29	94 AU P00925	AUN 1	13680	●
16	32	8	4	9	6	N16-15	90 NBR M00109	N 1	16199	●
16	32	11	0	12	6	N16-2	90 NBR M00109	N 1	16190	●
16	35	9	4,5	10	6	AUN16-38	94 AU P00925	AUN 1	14076	○
16	36	10	5	11	6	N16-11	90 NBR M00109	N 1	16197	○
17	35	10	5	11	6	AUN17-9	94 AU P00925	AUN 1	14080	○
18	24	4	2	4,7	2,5	N18-15	90 NBR M00109	N 1	16233	●
18	24	5	2,2	6	2,5	N18-9	90 NBR M00109	N 1	16230	●
18	25	4	2	4,7	3	N18-14	90 NBR M00109	N 1	16232	●
18	26	4	2	4,7	4	N18-17	90 NBR M00109	N 1	16235	●
18	28	8	5,2	9	4,5	AUN18-30	94 AU P00925	AUN 1	13689	●
18	28	8	5,2	9	4,5	N18-8	90 NBR M00109	N 1	17422	●
18	30	6	3	7	5	N18-19	90 NBR M00109	N 1	16238	●
18	30	8	5	9	5	AUN18-38	94 AU P00925	AUN 1	14088	●
18	32	7	3,5	8	5,5	AUN18-29	94 AU P00925	AUN 1	14084	●
18	32	7	3,5	8	5,5	N18-16	90 NBR M00109	N 1	16234	○
18	34	8	4	9	6	AUN18-31	94 AU P00925	AUN 1	11808	○
18	34	8	4	9	6	N18-3	90 NBR M00109	N 1	16227	○
18	35	8,5	4,3	9,5	6	AUN18-33	94 AU P00925	AUN 1	14086	●
18	35	8,5	4,3	9,5	6	N18-24	90 NBR M00108	N 1	16241	○
18	38	10	5	11	6	N18-5	90 NBR M00109	N 1	16228	●

● Available from stock ○ On request: Tool is available, delivery at short notice

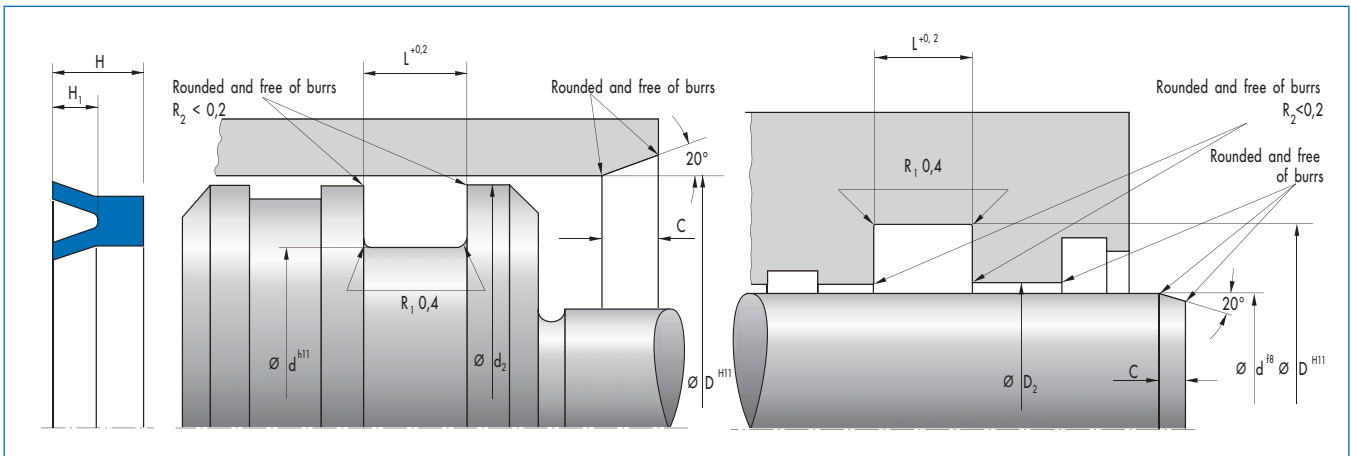


d	D	H	H ₁	L	C	Code	Material	Type	Article No.	
19	26	5	3	6	3	N19-5	90 NBR M00109	N 1	16273	●
19	34	8	4	9	5,5	N19-4	90 NBR M00109	N 1	16272	●
20	28	4	2	4,7	4	N20-29	90 NBR M00109	N 1	16294	●
20	28	8	5	9	4	AUN20-47	94 AU P00925	AUN 1	11818	●
20	30	8	4	9	4,5	AUN20-45	94 AU P00925	AUN 1	11817	●
20	30	8	4	9	4,5	N20-19	90 NBR M00109	N 1	16289	●
20	32	7,5	3,8	8,5	5	AUN20-60	94 AU P00925	AUN 1	14098	●
20	32	7,5	3,8	8,5	5	N20-33	90 NBR M00109	N 1	16297	●
20	33	6	3	7	5,5	N20-28	90 NBR M00109	N 1	16293	●
20	35	10	6	11	5,5	N20-42	90 NBR M00109	N 1	17965	●
20	36	8	4	9	6	AUN20-51	94 AU P00925	AUN 1	14378	●
20	36	8	4	9	6	N20-1	90 NBR M00109	N 1	16279	●
20	40	10	5	11	6	AUN20-49	94 AU P00925	AUN 1	14091	●
20	40	10	5	11	6	N20-18	90 NBR M00109	N 1	16288	●
20	45	12	6	13	6,5	AUN20-53	94 AU P00925	AUN 1	14093	○
20	45	12	6	13	6,5	N20-22	90 NBR M00109	N 1	17458	●
22	28	5	2,5	6	2,5	N22-22	90 NBR M00109	N 1	16339	●
22	28	8	5	9	2,5	AUN22-35	94 AU P00925	AUN 1	11834	○
22	30	6	3	7	4	AUN22-29	94 AU P00925	AUN 1	11833	●
22	30	6	3	7	4	N22-4	90 NBR M00109	N 1	16321	●
22	32	5	2,5	6	4,5	N22-13	90 NBR M00109	N 1	16334	●
22	34	6	3	7	5	AUN22-28	94 AU P00925	AUN 1	11832	○
22	34	6	3	7	5	N22-12	90 NBR M00109	N 1	16333	●
22	35	7	3	8	5,5	N22-24	90 NBR M00109	N 1	16340	●
22	35	8	4	9	5,5	AUN22-34	94 AU P00925	AUN 1	14106	●
22	36	8	4	9	5,5	N22-25	90 NBR M00108	N 1	16341	○
22	38	8	4	9	6	N22-8	90 NBR M00108	N 1	16324	●
22	40	10	5	11	6	AUN22-27	94 AU P00925	AUN 1	14104	○
22	40	10	5	11	6	N22-5	90 NBR M00109	N 1	16322	○
22	46	12	6	13	6	N22-11	90 NBR M00109	N 1	16332	○
23	32	5	2,5	6	4,5	N23-6	90 NBR M00108	N 1	16366	●
23	35	10	5	11	5	AUN23-5	94 AU P00925	AUN 1	11844	●
23	35	10	5	11	5	N23-3	90 NBR M00109	N 1	16364	○
23	43	10	5	11	6	N23-2	90 NBR M00109	N 1	16363	○
24	30	5	2,5	6	2,5	N24-16	90 NBR M00109	N 1	16383	●
24	31	5	2,5	6	3	N24-6	90 NBR M00109	N 1	16378	●
24	31	5	3,5	6	3	AUN24-28	94 AU P00925	AUN 1	11849	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	H ₁	L	C	Code	Material	Type	Article No.	
24	32	4	2	4,7	4	N24-8	90 NBR M00109	N 1	16379	●
24	32	7	4,5	8	4	AUN24-30	94 AU P00925	AUN 1	11850	●
24	34	5	2,5	6	4,5	N24-17	90 NBR M00109	N 1	16384	●
24	37	6	3	7	5,5	N24-22	90 NBR M00109	N 1	16386	●
24	40	8	4	9	6	AUN24-26	94 AU P00925	AUN 1	14255	●
24	40	8	4	9	6	N24-5	90 NBR M00109	N 1	16377	○
24	44	10	5	11	6	N24-20	90 NBR M00108	N 1	16385	○
24	50	12	6	13	6,5	AUN24-27	94 AU P00925	AUN 1	14111	●
24	50	12	6	13	6,5	N24-9	90 NBR M00109	N 1	16380	○
25	33	7	4,5	8	4	N25-22	90 NBR M00109	N 1	16400	●
25	35	5	2,5	6	4,5	AUN25-40	94 AU P00925	AUN 1	11856	●
25	35	5	2,5	6	4,5	N25-18	90 NBR M00109	N 1	16399	●
25	35	8	5	9	4,5	AUN25-28	94 AU P00925	AUN 1	11854	●
25	35	8	5	9	4,5	N25-35	90 NBR M00109	N 1	18116	●
25	38	7	3,5	8	5,5	N25-27	90 NBR M00109	N 1	16401	●
25	40	6	2,5	7	5,5	N25-12	90 NBR M00109	N 1	16397	●
25	40	11	7,5	12	5,5	AUN25-26	94 AU P00925	AUN 1	11853	●
25	42	8,5	4,25	9,5	6	AUN25-10	94 AU P00925	AUN 1	14116	●
25	42	8,5	4,25	9,5	6	N25-10	90 NBR M00109	N 1	16395	●
25	45	10	5	11	6	AUN25-24	94 AU P00925	AUN 1	11852	○
25	45	10	5	11	6	N25-6	90 NBR M00109	N 1	16393	●
25	50	12	6	13	6,5	AUN25-25	94 AU P00925	AUN 1	14115	○
25	50	12	6	13	6,5	N25-1	90 NBR M00109	N 1	16391	○
26	38	6	3	7	5	N26-14	90 NBR M00109	N 1	16428	●
26	42	8	4	9	6	N26-2	90 NBR M00109	N 1	16422	○
27	36	6	3	7	4,5	N27-2	90 NBR M00109	N 1	16444	●
28	38	5	2,5	6	4,5	N28-12	90 NBR M00109	N 1	16461	●
28	38	8	4	9	4,5	AUN28-34	94 AU P00925	AUN 1	14131	●
28	44	8	4	9	6	AUN28-36	94 AU P00925	AUN 1	12310	○
28	44	8	4	9	6	N28-17	90 NBR M00109	N 1	16464	●
28	46	10	5	11	6	AUN28-30	94 AU P00925	AUN 1	14127	○
28	46	10	5	11	6	N28-6	90 NBR M00109	N 1	16456	●
28	48	10	5	11	6	N28-10	90 NBR M00109	N 1	16459	●
29	45	8	4	9	6	N29-2	90 NBR M00108	N 1	16479	○
30	37	8	4,5	9	3	N30-7	90 NBR M00109	N 1	16487	●
30	37	8	5	9	3	AUN30-35	94 AU P00925	AUN 1	12319	●
30	40	5	2,5	6	4,5	AUN30-38	94 AU P00925	AUN 1	12322	●
30	40	5	2,5	6	4,5	N30-17	90 NBR M00109	N 1	16493	●
30	41	8	5,5	9	4,5	N30-27	90 NBR M00108	N 1	16497	○
30	45	10	5	11	5,5	AUN30-29	94 AU P00925	AUN 1	12317	●
30	45	10	5	11	5,5	N30-11	90 NBR M00109	N 1	16490	●
30	48	9	4,5	10	6	N30-26	90 NBR M00109	N 1	16496	○
30	50	10	5	11	6	AUN30-28	94 AU P00925	AUN 1	14137	●
30	50	10	5	11	6	N30-6	90 NBR M00109	N 1	16486	●
30	55	12	6	13	6,5	N30-5	90 NBR M00109	N 1	16485	●
30	55	15	7,5	16	6,5	N30-4	90 NBR M00108	N 1	16484	○
32	40	4	2	4,7	4	N32-17	90 NBR M00109	N 1	16510	●
32	40	7	5	8	4	N32-28	90 NBR M00109	N 1	16517	●
32	44	6	3	7	5	N32-19	90 NBR M00109	N 1	16512	●
32	45	6,5	3,2	7,5	5,5	AUN32-37	94 AU P00925	AUN 1	14147	○

● Available from stock ○ On request: Tool is available, delivery at short notice

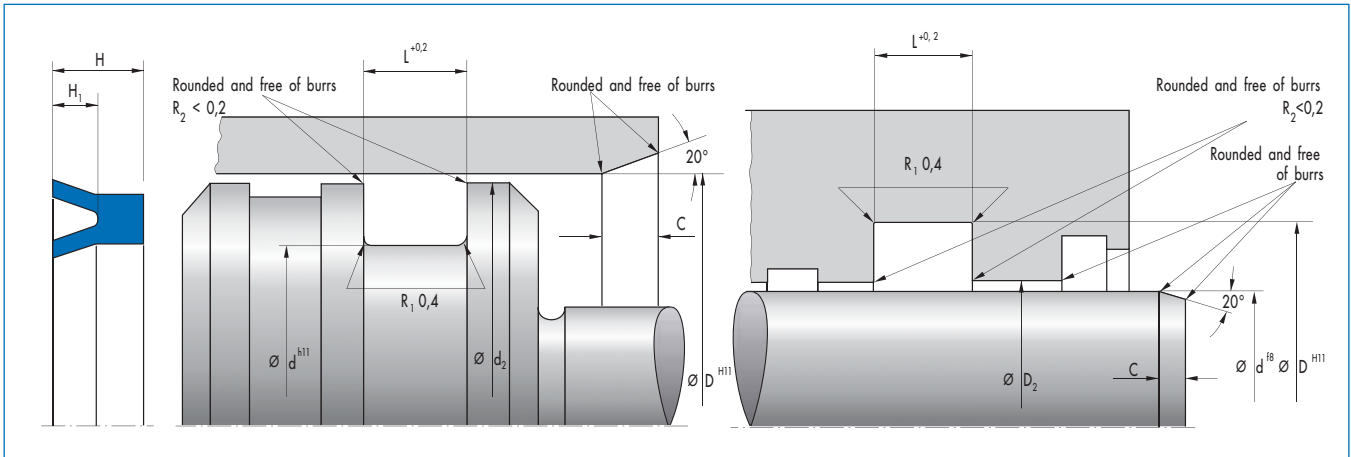


d	D	H	H ₁	L	C	Code	Material	Type	Article No.	
32	45	6,5	3,2	7,5	5,5	N32-18	90 NBR M00109	N 1	16511	●
32	48	8	2,5	9	6	N32-2	90 NBR M00109	N 1	16506	●
32	48	8	4	9	6	N32-22	90 NBR M00109	N 1	16514	●
32	50	10	5	11	6	AUN32-39	94 AU P00925	AUN 1	14149	●
32	50	10	5	11	6	N32-24	90 NBR M00109	N 1	16516	●
32	52	10	5	11	6	AUN32-33	94 AU P00925	AUN 1	14145	○
32	52	10	5	11	6	N32-15	90 NBR M00109	N 1	16508	●
33	43	6	3	7	4,5	N33-7	90 NBR M00109	N 1	16534	●
34	45	7	3,5	8	4,5	AUN34-10	94 AU P00925	AUN 1	12341	○
35	45	6	2,5	7	4,5	N35-5	90 NBR M00109	N 1	16547	●
35	45	6	3	7	4,5	N35-14	90 NBR M00109	N 1	16552	●
35	45	8	5	9	4,5	AUN35-25	94 AU P00925	AUN 1	12344	●
35	50	8	4	9	5,5	N35-16	90 NBR M00109	N 1	16553	●
35	51	8	4	9	6	N35-9	90 NBR M00109	N 1	16549	●
35	55	10	5	11	6	AUN35-20	94 AU P00925	AUN 1	14152	●
35	55	10	5	11	6	N35-6	90 NBR M00109	N 1	11664	●
35	56	10	5	11	6	N35-31	90 NBR M00108	N 1	16559	○
35	60	12	6	13	6,5	AUN35-22	94 AU P00925	AUN 1	14154	○
35	60	12	6	13	6,5	N35-11	90 NBR M00108	N 1	16550	●
36	46	6	3	7	4,5	N36-7	90 NBR M00109	N 1	16571	●
36	48	6	3	7	5	N36-34	90 NBR M00109	N 1	16568	●
36	50	7	3,5	8	5,5	N36-9	90 NBR M00109	N 1	16573	●
36	55	10	5	11	6	N36-1	90 NBR M00109	N 1	16566	●
38	50	6	3	7	5	N38-5	90 NBR M00109	N 1	16586	●
38	50	9	6	10	5	AUN38-16	94 AU P00925	AUN 1	13758	●
38	58	10	5	11	6	AUN38-17	94 AU P00925	AUN 1	14165	●
38	58	10	5	11	6	N38-6	90 NBR M00109	N 1	16587	●
38	60	12	6	13	6	N38-14	90 NBR M00109	N 1	16593	○
39	45	4	2	4,7	2,5	N39-3	90 NBR M00108	N 1	16600	○
40	46	4	2	4,7	2,5	N40-25	90 NBR M00109	N 1	16619	●
40	48	8	5	9	4	N40-50	90 NBR M00109	N 1	16629	●
40	50	5	2,5	6	4,5	N40-17	90 NBR M00109	N 1	16615	●
40	50	8	5	9	4,5	AUN40-56	94 AU P00925	AUN 1	14179	●
40	50	9	0	10	4	N40-219	90 NBR M00109	N 1	18024	●
40	52	8	4	9	5	N40-45	90 NBR M00109	N 1	16627	●
40	55	10	5	11	5,5	N40-52	90 NBR M00109	N 1	16630	●
40	56	8	4	9	6	N40-12	90 NBR M00109	N 1	16611	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	H ₁	L	C	Code	Material	Type	Article No.	
40	56	10	5	11	6	AUN40-54	94 AU P00925	AUN 1	14177	●
40	56	10	5	11	6	N40-29	90 NBR M00109	N 1	16621	●
40	60	10	5	11	6	AUN40-47	94 AU P00925	AUN 1	14174	●
40	60	10	5	11	6	N40-9	90 NBR M00109	N 1	16610	●
40	64	12	6	13	6	N40-22	90 NBR M00108	N 1	16617	○
40	65	12	6	13	6,5	AUN40-41	94 AU P00925	AUN 1	14176	●
40	65	12	6	13	6,5	N40-5	90 NBR M00109	N 1	16608	●
40	70	15	7,5	16	7,5	N40-6	90 NBR M00108	N 1	16609	○
40	80	20	10	21	11	N40-14	90 NBR M00109	N 1	16612	○
42	50	6	3	7	4	N42-13	90 NBR M00109	N 1	16654	●
42	55	6,5	3,25	7,5	5,5	N42-5	90 NBR M00109	N 1	16649	●
42	62	10	5	11	6	N42-10	90 NBR M00109	N 1	16652	●
43	63	10	5	11	6	N43-1	90 NBR M00109	N 1	16657	○
44	55	6	3	7	4,5	N44-5	90 NBR M00109	N 1	16661	●
45	52	8	4,5	9	3	N45-4	90 NBR M00109	N 1	16672	●
45	57	6	3	7	5	N45-13	90 NBR M00109	N 1	16679	●
45	58	6,5	3,2	7,5	5,5	N45-9	90 NBR M00109	N 1	16677	●
45	63	10	5	11	6	AUN45-30	94 AU P00925	AUN 1	14192	●
45	63	10	5	11	6	N45-5	90 NBR M00109	N 1	16673	●
45	65	10	5	11	6	AUN45-25	94 AU P00925	AUN 1	14188	●
45	65	10	5	11	6	N45-6	90 NBR M00109	N 1	16674	●
45	70	12	6	13	6,5	AUN45-29	94 AU P00925	AUN 1	14191	○
45	70	12	6	13	6,5	N45-8	90 NBR M00109	N 1	16676	○
48	60	6	3	7	5	N48-4	90 NBR M00109	N 1	16707	●
48	60	9	6	10	5	AUN48-27	94 AU P00925	AUN 1	13789	●
48	65	10	5	11	6	N48-17	90 NBR M00108	N 1	16715	●
48	68	10	5	11	6	N48-7	90 NBR M00109	N 1	16709	●
49	65	8	3	9	6	N49-2	90 NBR M00109	N 1	16722	○
50	56	8	5,8	9	2,5	N50-28	90 NBR M00109	N 1	11666	●
50	60	10	6	11	4,5	N50-31	90 NBR M00109	N 1	16740	●
50	62	6	3	7	5	N50-23	90 NBR M00109	N 1	16735	●
50	62	9	6	10	5	AUN50-47	94 AU P00925	AUN 1	14211	●
50	63	6	3	7	5,5	AUN50-50	94 AU P00925	AUN 1	13799	●
50	70	10	5	11	6	AUN50-41	94 AU P00925	AUN 1	14207	●
50	70	10	5	11	6	N50-6	90 NBR M00109	N 1	16728	●
50	70	18	12	19	6	AUN50-49	94 AU P00925	AUN 1	14212	●
50	72	12	6	13	6	N50-10	90 NBR M00109	N 1	16730	●
50	74	12	6	13	6	N50-20	90 NBR M00109	N 1	16734	○
50	75	12,5	6,25	13,5	6,5	AUN50-45	94 AU P00925	AUN 1	14210	○
50	80	15	7,5	16	7,5	N50-5	90 NBR M00109	N 1	16727	○
51	63	6	3	7	5	N51-2	90 NBR M00109	N 1	16755	●
52	62	6	3	7	4,5	N52-9	90 NBR M00109	N 1	16763	●
52	70	9	4,5	10	6	AUN52-14	94 AU P00925	AUN 1	14250	○
53	65	6	2,5	7	5	AUN53-5	94 AU P00925	AUN 1	12297	●
53	65	10	3	11	5	N53-2	90 NBR M00109	N 1	16768	○
55	65	5	2,5	6	4,5	N55-26	90 NBR M00109	N 1	16787	●
55	68	6,5	3,2	7,5	5,5	N55-16	90 NBR M00109	N 1	16783	●
55	70	7,5	3,7	8,5	5,5	N55-17	90 NBR M00109	N 1	16784	●
55	75	10	5	11	6	AUN55-31	94 AU P00925	AUN 1	14227	●
55	75	10	5	11	6	N55-5	90 NBR M00109	N 1	16778	●

● Available from stock ○ On request: Tool is available, delivery at short notice

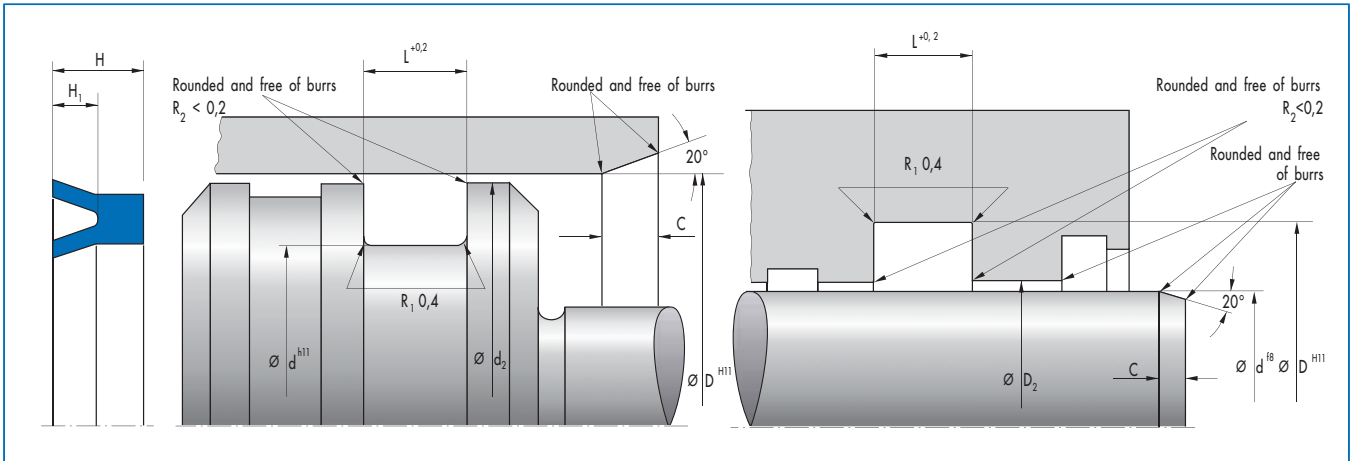


d	D	H	H ₁	L	C	Code	Material	Type	Article No.	
55	80	12	6	13	6,5	N55-8	90 NBR M00109	N 1	16780	○
55	85	15	7,5	16	7,5	N55-23	90 NBR M00108	N 1	16786	○
58	70	6	3	7	5	N58-6	90 NBR M00109	N 1	16806	●
60	68	8	4,5	9	4	N60-5	90 NBR M00109	N 1	16820	●
60	68	8	5,5	9	4	AUN60-44	94 AU P00925	AUN 1	12157	○
60	72	6	3	7	5	AUN60-35	94 AU P00925	AUN 1	14448	○
60	74	7	3,5	8	5,5	N60-17	90 NBR M00108	N 1	16828	●
60	80	10	5	11	6	AUN60-37	94 AU P00925	AUN 1	14450	●
60	80	10	5	11	6	N60-3	90 NBR M00109	N 1	16818	●
60	80	18	12	19	6	AUN60-42	94 AU P00925	AUN 1	14454	●
60	84	12	6	13	6	N60-16	90 NBR M00109	N 1	16827	○
60	85	12	6	13	6,5	N60-12	90 NBR M00109	N 1	16825	○
60	85	12,5	6,25	13,5	6,5	AUN60-41	94 AU P00925	AUN 1	14453	○
60	90	15	7,5	16	7,5	N60-23	90 NBR M00109	N 1	16831	○
61	73	6	3	7	5	N61-1	90 NBR M00109	N 1	16852	○
62	78	8	4	9	6	N62-11	90 NBR M00109	N 1	16858	●
62	82	10	5	11	6	N62-4	90 NBR M00109	N 1	16855	○
63	93	15	7,5	16	7,5	N63-1	90 NBR M00108	N 1	16865	○
64	80	8	4	9	6	N64-1	90 NBR M00109	N 1	16870	●
65	80	7,5	3,7	8,5	5,5	N65-12	90 NBR M00109	N 1	16882	●
65	80	11	7,5	12	5,5	AUN65-27	94 AU P00925	AUN 1	14240	○
65	85	10	5	11	6	AUN65-26	94 AU P00925	AUN 1	14251	●
65	85	10	5	11	6	N65-10	90 NBR M00109	N 1	16880	○
65	90	12	6	13	6,5	N65-7	90 NBR M00109	N 1	16879	○
66	76	10	6	11	4,5	N66-2	90 NBR M00109	N 1	16887	●
68	78	10	6	11	4,5	N68-9	90 NBR M00109	N 1	16896	○
68	80	6	2,5	7	5	AUN68-10	94 AU P00925	AUN 1	14461	●
68	80	12	6	13	5	N68-7	90 NBR M00109	N 1	16893	●
70	82	12	7,5	13	5	N70-12	90 NBR M00109	N 1	16905	○
70	85	7,5	3,7	8,5	5,5	N70-6	90 NBR M00109	N 1	16902	●
70	90	10	5	11	6	N70-1	90 NBR M00109	N 1	16899	●
70	90	18	12	19	6	AUN70-20	94 AU P00925	AUN 1	14465	●
70	95	12	6	13	6,5	AUN70-21	94 AU P00925	AUN 1	14466	○
70	95	12	6	13	6,5	N70-2	90 NBR M00109	N 1	16900	○
70	100	15	7,5	16	7,5	N70-5	90 NBR M00108	N 1	16901	○
72	84	6	3	7	5	N72-5	90 NBR M00109	N 1	16922	●
74	80	8	5,5	9	2,5	N74-2	90 NBR M00109	N 1	16932	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	H ₁	L	C	Code	Material	Type	Article No.	
75	90	7,5	3,7	8,5	5,5	AUN75-28	94 AU P00925	AUN 1	12182	●
75	90	7,5	3,7	8,5	5,5	N75-12	90 NBR M00109	N 1	17431	●
75	95	10	5	11	6	N75-6	90 NBR M00109	N 1	16935	●
75	100	12	6	13	6,5	N75-9	90 NBR M00109	N 1	16936	○
75	100	15	7,5	16	6,5	N75-4	90 NBR M00109	N 1	16934	○
75	105	15	7,5	16	7,5	N75-17	90 NBR M00109	N 1	16939	○
78	86	8	4,5	9	4	N78-1	90 NBR M00109	N 1	16950	●
78	102	12	6	13	6	N78-3	90 NBR M00109	N 1	16951	○
80	93	8	5	9	5,5	N80-13	90 NBR M00109	N 1	16964	○
80	95	7,5	3,7	8,5	5,5	N80-16	90 NBR M00109	N 1	16965	○
80	100	10	5	11	6	AUN80-25	94 AU P00925	AUN 1	14482	●
80	100	10	5	11	6	N80-2	90 NBR M00109	N 1	17367	●
80	105	12	6	13	6,5	N80-12	90 NBR M00108	N 1	16963	○
80	110	15	7,5	16	7,5	AUN80-26	94 AU P00925	AUN 1	14483	○
80	110	15	7,5	16	7,5	N80-3	90 NBR M00108	N 1	16960	○
80	115	15	7,5	16	10	N80-5	90 NBR M00109	N 1	16961	○
82	100	9	4	10	6	N82-2	90 NBR M00109	N 1	16977	○
85	100	7,5	3,7	8,5	5,5	N85-7	90 NBR M00109	N 1	16993	●
85	105	10	5	11	6	N85-2	90 NBR M00109	N 1	16989	●
85	105	12	6	13	6	N85-1	90 NBR M00109	N 1	16988	○
85	105	18	12	19	6	AUN85-13	94 AU P00925	AUN 1	14296	○
85	110	12	6	13	6,5	N85-3	90 NBR M00109	N 1	16990	○
85	115	15	7,5	16	7,5	N85-4	90 NBR M00109	N 1	16991	○
86	98	12	6	13	5	N86-1	90 NBR M00109	N 1	11675	○
88	100	6	3	7	5	N88-3	90 NBR M00109	N 1	16999	●
90	105	7,5	3,7	8,5	5,5	N90-13	90 NBR M00108	N 1	17009	●
90	110	10	5	11	6	N90-6	90 NBR M00109	N 1	17007	●
90	110	18	12	19	6	AUN90-19	94 AU P00925	AUN 1	14500	○
90	115	12	6	13	6,5	N90-8	90 NBR M00109	N 1	17008	○
90	120	15	7,5	16	7,5	AUN90-20	94 AU P00925	AUN 1	14501	●
90	120	15	7,5	16	7,5	N90-2	90 NBR M00109	N 1	17005	○
95	110	7,5	3,75	8,5	5,5	N95-9	90 NBR M00108	N 1	17021	○
95	110	15	10	16	5,5	AUN95-18	94 AU P00925	AUN 1	12122	○
95	115	10	5	11	6	N95-4	90 NBR M00108	N 1	17019	○
95	115	18	12	19	6	AUN95-15	94 AU P00925	AUN 1	14253	○
95	120	12	6	13	6,5	N95-7	90 NBR M00108	N 1	17020	○
100	110	5	2,5	6	4,5	N100-11	90 NBR M00109	N 1	17034	●
100	120	10	5	11	6	N100-9	90 NBR M00109	N 1	17032	●
100	125	12	6	13	6,5	AUN100-26	94 AU P00925	AUN 1	14513	○
100	125	12	6	13	6,5	N100-8	90 NBR M00109	N 1	17031	●
100	130	15	7,5	16	7,5	AUN100-27	94 AU P00925	AUN 1	14514	○
100	130	15	7,5	16	7,5	N100-6	90 NBR M00109	N 1	11687	○
100	140	20	10	21	11	N100-10	90 NBR M00109	N 1	17033	○
105	120	8	4	9	5,5	N105-6	90 NBR M00109	N 1	17058	○
105	125	10	5	11	6	N105-8	90 NBR M00109	N 1	17059	●
106	118	12	6	13	5	N106-4	90 NBR M00108	N 1	11691	○
110	125	7,5	3,7	8,5	5,5	N110-10	90 NBR M00109	N 1	17039	●
110	125	12	7	13	5,5	AUN110-23	94 AU P00925	AUN 1	14532	○
110	130	10	5	11	6	N110-3	90 NBR M00109	N 1	17065	●
110	130	18	12	19	6	AUN110-19	94 AU P00925	AUN 1	14530	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	H ₁	L	C	Code	Material	Type	Article No.	
110	135	12	6	13	6,5	N110-9	90 NBR M00109	N 1	17037	○
110	140	15	7,5	16	7,5	AUN110-18	94 AU P00925	AUN 1	14529	○
110	140	15	7,5	16	7,5	N110-2	90 NBR M00108	N 1	15905	○
115	140	12	6	13	6,5	N115-3	90 NBR M00109	N 1	17073	○
120	140	10	5	11	6	N120-3	90 NBR M00109	N 1	17084	●
120	150	15	7,5	16	7,5	N120-1	90 NBR M00109	N 1	17082	●
125	145	10	5	11	6	N125-2	90 NBR M00109	N 1	17089	○
125	155	15	7,5	16	7,5	N125-3	90 NBR M00109	N 1	17090	○
130	150	10	5	11	6	N130-5	90 NBR M00109	N 1	17103	●
130	160	15	7,5	16	7,5	AUN130-13	94 AU P00925	AUN 1	14560	○
130	160	15	7,5	16	7,5	N130-1	90 NBR M00108	N 1	17101	○
135	150	10	4	11	5,5	N135-4	90 NBR M00108	N 1	11701	●
135	160	12	6	13	6,5	N135-5	90 NBR M00109	N 1	11702	●
140	170	15	7,5	16	7,5	N140-2	90 NBR M00109	N 1	17112	○
140	175	20	8	21	10	N140-9	90 NBR M00108	N 1	11704	○
145	170	15	8	16	6,5	N145-2	90 NBR M00108	N 1	17117	○
145	175	15	7,5	16	7,5	N145-1	90 NBR M00108	N 1	17116	○
150	170	10	5	11	6	N150-9	90 NBR M00108	N 1	17122	●
150	170	18	12	19	6	AUN150-11	94 AU P00925	AUN 1	103802	○
150	180	15	7,5	16	7,5	AUN150-13	94 AU P00925	AUN 1	103804	○
150	180	15	7,5	16	7,5	N150-1	90 NBR M00108	N 1	17120	○
155	185	15	7,5	16	7,5	N155-1	90 NBR M00108	N 1	17131	○
160	180	14	7	15	6	N160-9	90 NBR M00108	N 1	17137	●
160	185	15	7,5	16	6,5	N160-11	90 NBR M00108	N 1	17138	○
160	190	15	7,5	16	7,5	N160-4	90 NBR M00108	N 1	17135	○
165	195	15	7,5	16	7,5	N165-1	90 NBR M00108	N 1	17139	○
165	195	26	17,5	27	7,5	AUN165-7	94 AU P00925	AUN 1	103810	○
170	200	15	7,5	16	7,5	N170-4	90 NBR M00109	N 1	17143	●
170	200	26	17,5	27	7,5	AUN170-7	94 AU P00925	AUN 1	103812	○
170	210	20	10	21	11	N170-3	90 NBR M00108	N 1	17142	○
175	205	15	7,5	16	7,5	N175-2	90 NBR M00108	N 1	17145	○
180	200	10	5	11	6	N180-8	90 NBR M00108	N 1	17151	●
180	200	18	12	19	6	AUN180-11	94 AU P00925	AUN 1	103815	○
180	204	12	6	13	6	N180-4	90 NBR M00108	N 1	17149	○
180	210	15	7,5	16	7,5	N180-5	90 NBR M00108	N 1	17150	○
180	220	20	10	21	11	AUN180-9	94 AU P00925	AUN 1	103813	○
190	220	15	7,5	16	7,5	N190-2	90 NBR M00108	N 1	17158	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	H ₁	L	C	Code	Material	Type	Article No.	
195	225	15	7,5	16	7,5	N195-2	90 NBR M00108	N 1	17161	○
200	230	15	7,5	16	7,5	AUN200-8	94 AU P00925	AUN 1	103825	○
200	230	15	7,5	16	7,5	N200-1	90 NBR M00108	N 1	17166	○
200	240	20	10	21	11	N200-2	90 NBR M00109	N 1	17167	○
205	230	15	7,5	16	6,5	N205-1	90 NBR M00108	N 1	17172	○
210	240	20	10	21	7,5	N210-4	90 NBR M00108	N 1	17178	○
210	250	20	10	21	11	N210-1	90 NBR M00108	N 1	17177	○
210	250	34	23	35	11	AUN210-5	94 AU P00925	AUN 1	103831	○
220	250	15	7,5	16	7,5	N220-6	90 NBR M00108	N 1	17188	○
220	250	26	17,5	27	7,5	AUN220-7	94 AU P00925	AUN 1	103834	○
225	255	15	7,5	16	7,5	N225-1	90 NBR M00108	N 1	17189	○
230	255	15	7,5	16	6,5	N230-5	90 NBR M00108	N 1	17196	○
230	270	20	10	21	11	N230-1	90 NBR M00108	N 1	17194	○
235	275	20	10	21	11	N235-2	90 NBR M00108	N 1	15909	○
240	272	16	8	17	8	N240-4	90 NBR M00108	N 1	17197	○
240	272	26	17,5	27	8	AUN240-6	94 AU P00925	AUN 1	103838	○
240	280	20	10	21	11	N240-3	90 NBR M00108	N 1	11895	○
250	280	25	12,5	26	7,5	N250-1	90 NBR M00108	N 1	18096	○
250	280	26	17,5	27	7,5	AUN250-12	94 AU P00925	AUN 1	103840	○
260	285	12	6	13	6,5	N260-2	90 NBR M00108	N 1	11896	○
260	300	20	10	21	11	N260-1	90 NBR M00109	N 1	17203	○
280	310	15	7,5	16	7,5	N280-7	90 NBR M00108	N 1	17209	●
280	320	20	10	21	11	N280-4	90 NBR M00108	N 1	17208	○
285	330	34	23	35	13	AUN285-4	94 AU P00925	AUN 1	103847	○
290	330	20	10	21	11	N290-1	90 NBR M00108	N 1	17211	○
300	330	16	8	17	7,5	N300-7	90 NBR M00108	N 1	17214	○
310	350	20	10	21	11	N310-1	90 NBR M00108	N 1	17219	●
350	390	35	15	36	11	N350-2	90 NBR M00108	N 1	17226	○
360	400	20	10	21	11	N360-1	90 NBR M00108	N 1	17228	○
380	420	20	10	21	11	N380-2	90 NBR M00108	N 1	17231	○
390	415	15	7,5	16	6,5	N390-1	90 NBR M00108	N 1	17233	○
400	440	20	10	21	11	N400-1	90 NBR M00108	N 1	17234	○
420	450	15	7,5	16	7,5	N420-2	90 NBR M00108	N 1	17239	○
440	480	25	10	26	11	N440-1	90 NBR M00108	N 1	17242	○
460	500	20	10	21	11	N460-2	90 NBR M00108	N 1	17248	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel U-Ring N 100, AUN 100

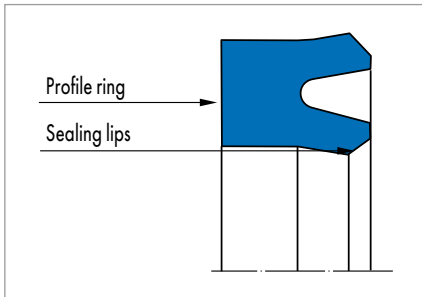


Fig. 1 Merkel U-Ring N 100, AUN 100

Product description

Merkel U-ring with symmetrical profile and set back sealing edges for rods/pistons.

Product advantages

Single-acting piston or rod seal, preferably for spare parts requirements.

Application

Special cylinders, agricultural machinery, forestry equipment, injection moulding machines, loading platforms, standard cylinders.

Material

N 100

Material	Code	Hardness
Nitrile rubber	90 NBR 109	90 Shore A

AUN 100

Material	Code	Hardness
Polyurethane	94 AU 925	94 Shore A

Operating conditions

Material	90 NBR 109	94 AU 925
	Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +100	-30 ... +110
HFA fluids	+5 ... +60	+5 ... +60
HFB fluids	+5 ... +60	+5 ... +60
HFC fluids	-30 ... +60	-30 ... +50
HFD fluids	-	-
Water	+5 ... +90	+5 ... +40
HETG (rapeseed oil)	-30 ... +80	-30 ... +60
HEES (synthetic ester)	-	-30 ... +80
HEPG (glycol)	-30 ... +60	-30 ... +40
Mineral greases	-30 ... +100	-30 ... +110
Pressure p in MPa	10 MPa	30 MPa
Running speed v in m/s	0,5	

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,05 ... 0,3 µm	≤2,5 µm
Groove base	≤1,6 µm	≤6,3 µm
Groove flanks	≤3,0 µm	≤15,0 µm

Percentage contact area M_v >50% to max. 90% at cutting depth c = Rz/2 and reference line C ref = 0%.

Design notes

Please observe our general design notes in → Technical Manual.

Gap dimension

The decisive factor for the function of the seal is the largest gap dimension occurring during operation on the non-pressurised side of the seal. → Technical Manual.

N 100 (material 90 NBR 109)

Profile	Max. permissible gap dimension		
	5 MPa	10 MPa	16 MPa
≤5,0	0,45	0,25	0,15
>5,0	0,50	0,30	0,20

AUN 100 (material 94 AU 925)

Profile	Max. permissible gap dimension			
	10 MPa	16 MPa	30 MPa	10 MPa
≤5,0	0,45	0,35	0,25	0,25
>5,0	0,50	0,40	0,30	0,30

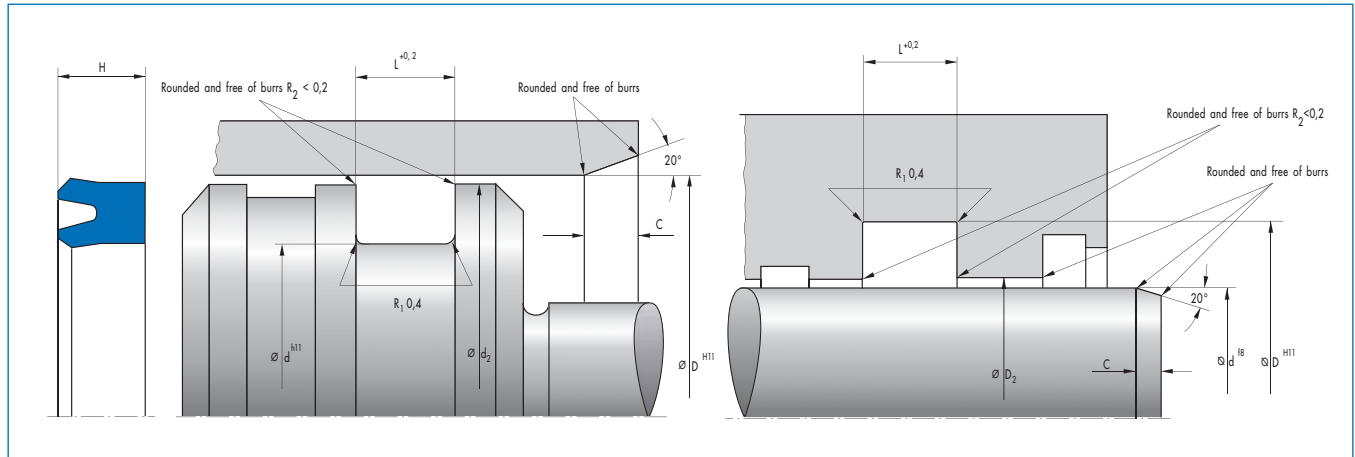
Tolerance recommendation and dimension D₂/d₂

The admissible gap width, tolerances, guide play and deflection of the guide under load are to be taken into account when designing D₂ (rod seal) or d₂ (piston seal). → Technical Manual.

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal. → Technical Manual. Note: the use of male adaptors increases the reliability. Further information is available on enquiry.

Article list

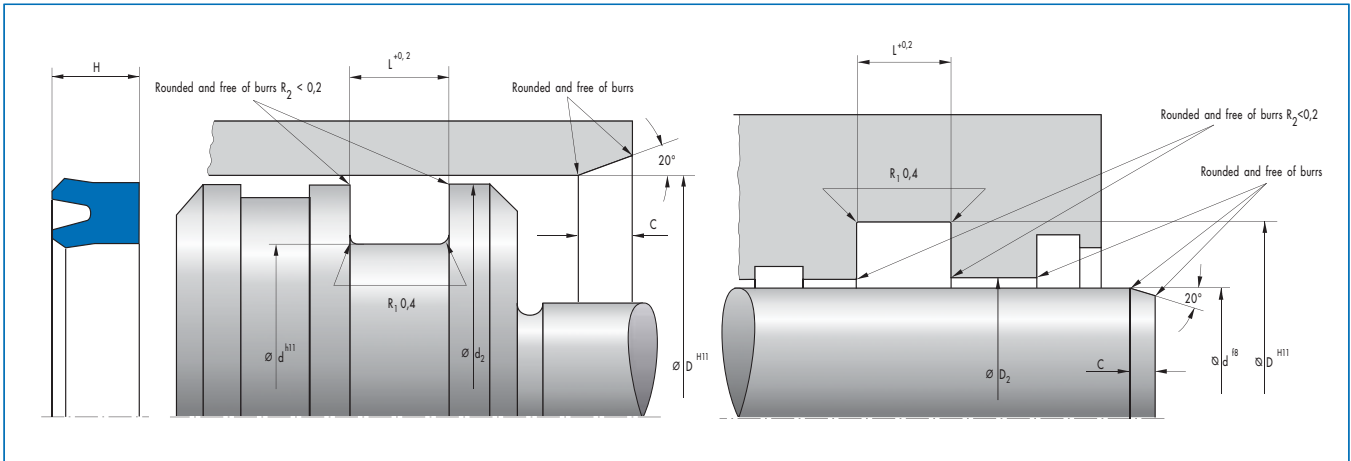


d	D	H	Profile	L	C	Code	Material	Type	Article No.	
8	16	8	4	9	3,5	N8-101	90 NBR M00109	N 100	18047	●
10	20	8	5	9	4	AUN10-106	94 AU P00925	AUN 100	14343	●
10	20	8	5	9	4	N10-103	90 NBR M00109	N 100	17744	●
10	22	8	6	9	5	AUN10-107	94 AU P00925	AUN 100	14344	●
10	22	8	6	9	5	N10-104	90 NBR M00109	N 100	17982	●
10	25	10	7,5	11	5,5	N10-105	90 NBR M00109	N 100	17912	●
12	22	8	5	9	4	AUN12-102	94 AU P00925	AUN 100	14345	●
12	24	10	6	11	5	N12-100	90 NBR M00109	N 100	17978	●
12	25	10	6,5	11	5,5	AUN12-103	94 AU P00925	AUN 100	14346	●
12	26	10	7	11	5,5	N12-101	90 NBR M00109	N 100	18056	●
14	24	8	5	9	4	AUN14-103	94 AU P00925	AUN 100	14347	●
14	28	10	7	11	5,5	N14-102	90 NBR M00109	N 100	17805	●
15	25	8	5	9	4	AUN15-103	94 AU P00925	AUN 100	11799	●
15	28	10	6,5	11	5,5	AUN15-104	94 AU P00925	AUN 100	11800	○
15	28	10	6,5	11	5,5	N15-101	90 NBR M00109	N 100	17783	●
15	30	10	7,5	11	5,5	N15-102	90 NBR M00109	N 100	11909	●
16	26	8	5	9	4	AUN16-105	94 AU P00925	AUN 100	14420	●
16	32	10	8	11	6	N16-104	90 NBR M00109	N 100	17802	●
18	28	8	5	9	4,5	AUN18-104	94 AU P00925	AUN 100	11812	●
18	30	8	6	9	5	AUN18-105	94 AU P00925	AUN 100	11813	●
18	30	10	6	11	5	N18-102	90 NBR M00109	N 100	17580	●
18	35	12	8,5	13	6	N18-103	90 NBR M00109	N 100	17807	○
20	30	8	5	9	4,5	AUN20-107	94 AU P00925	AUN 100	11829	●
20	30	10	5	11	4,5	AUN20-110	94 AU P00925	AUN 100	11830	●
20	32	8	6	9	5	AUN20-108	94 AU P00925	AUN 100	14404	●
20	35	10	7,5	11	5,5	N20-102	90 NBR M00109	N 100	16314	●
20	36	10	8	11	6	N20-105	90 NBR M00109	N 100	17857	○
20	40	12	10	13	6	N20-106	90 NBR M00109	N 100	17933	●
22	32	8	5	9	4,5	AUN22-103	94 AU P00925	AUN 100	11838	●
22	34	10	6	11	5	N22-101	90 NBR M00109	N 100	17846	●
22	35	10	6,5	11	5,5	AUN22-104	94 AU P00925	AUN 100	14349	●
22	38	10	8	11	6	N22-102	90 NBR M00109	N 100	17934	●
24	40	10	8	11	6	N24-100	90 NBR M00109	N 100	17664	●
25	35	8	5	9	4,5	AUN25-110	94 AU P00925	AUN 100	12304	●
25	38	10	6,5	11	5,5	AUN25-111	94 AU P00925	AUN 100	14351	●

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	Profile	L	C	Code	Material	Type	Article No.	
25	40	10	7,5	11	5,5	AUN25-112	94 AU P00925	AUN 100	14391	●
25	40	10	7,5	11	5,5	N25-108	90 NBR M00109	N 100	17762	●
25	45	12	10	13	6	N25-109	90 NBR M00108	N 100	17892	●
28	40	10	6	11	5	AUN28-103	94 AU P00925	AUN 100	14352	●
28	48	12	10	13	6	N28-102	90 NBR M00109	N 100	17916	●
30	40	10	5	11	4,5	AUN30-101	94 AU P00925	AUN 100	14353	●
30	42	10	6	11	5	AUN30-108	94 AU P00925	AUN 100	14354	●
30	42	10	6	11	5	N30-106	90 NBR M00109	N 100	17782	●
30	45	10	7,5	11	5,5	AUN30-109	94 AU P00925	AUN 100	14355	●
30	45	10	7,5	11	5,5	N30-107	90 NBR M00109	N 100	17694	●
30	50	12	10	13	6	AUN30-100	94 AU P00925	AUN 100	14141	●
30	50	12	10	13	6	N30-103	90 NBR M00109	N 100	16504	●
32	45	10	6,5	11	5,5	AUN32-106	94 AU P00925	AUN 100	14356	●
32	45	10	6,5	11	5,5	N32-104	90 NBR M00109	N 100	17547	●
32	50	12	9	13	6	N32-105	90 NBR M00109	N 100	17784	●
35	45	10	5	11	4,5	AUN35-112	94 AU P00925	AUN 100	14357	●
35	48	10	6,5	11	5,5	AUN35-109	94 AU P00925	AUN 100	12262	●
35	50	10	7,5	11	5,5	AUN35-110	94 AU P00925	AUN 100	14390	●
35	50	10	7,5	11	5,5	N35-106	90 NBR M00109	N 100	17910	●
35	52	12	8,5	13	6	N35-107	90 NBR M00108	N 100	18074	●
35	55	10	10	11	6	N35-100	90 NBR M00109	N 100	16563	●
35	55	12	10	13	6	AUN35-113	94 AU P00925	AUN 100	14318	●
35	55	12	10	13	6	N35-108	90 NBR M00109	N 100	17649	●
38	55	10	8,5	11	6	AUN38-103	94 AU P00925	AUN 100	14323	●
38	58	12	10	13	6	N38-102	90 NBR M00109	N 100	17789	●
40	50	10	5	11	4,5	AUN40-112	94 AU P00925	AUN 100	14398	●
40	55	9,5	7,5	10,5	5,5	N40-115	90 NBR M00109	N 100	18063	●
40	55	10	7,5	11	5,5	AUN40-113	94 AU P00925	AUN 100	14358	●
40	56	10	8	11	6	N40-111	90 NBR M00109	N 100	17662	●
40	60	12	10	13	6	N40-110	90 NBR M00109	N 100	17698	●
40	60	13	10	14	6	AUN40-105	94 AU P00925	AUN 100	14169	●
42	62	12	10	13	6	N42-101	90 NBR M00109	N 100	17935	●
45	55	10	5	11	4,5	AUN45-105	94 AU P00925	AUN 100	14359	●
45	58	10	6,5	11	5,5	N45-103	90 NBR M00109	N 100	17858	●
45	60	10	7,5	11	5,5	AUN45-104	94 AU P00925	AUN 100	14360	●
45	60	10	7,5	11	5,5	N45-109	90 NBR M00109	N 100	35153	●
45	65	12	10	13	6	AUN45-112	94 AU P00925	AUN 100	35601	●
45	65	12	10	13	6	N45-102	90 NBR M00109	N 100	16693	●
48	68	12	10	13	6	N48-100	90 NBR M00109	N 100	17625	○
50	60	10	5	11	4,5	AUN50-106	94 AU P00925	AUN 100	14361	●
50	65	10	7,5	11	5,5	AUN50-107	94 AU P00925	AUN 100	14362	●
50	65	12	7,5	13	5,5	N50-210	90 NBR M00109	N 100	18000	●
50	70	12	10	13	6	AUN50-108	94 AU P00925	AUN 100	14267	●
50	70	12	10	13	6	N50-104	90 NBR M00109	N 100	17650	●
50	75	15	12,5	16	6,5	N50-105	90 NBR M00109	N 100	17827	○
52	62	12	5	13	4,5	AUN52-102	94 AU P00925	AUN 100	12296	●
52	72	12	10	13	6	N52-101	90 NBR M00109	N 100	17755	●
55	70	12	7,5	13	5,5	AUN55-105	94 AU P00925	AUN 100	14363	●
55	75	12	10	13	6	AUN55-106	94 AU P00925	AUN 100	14364	●
55	75	12	10	13	6	N55-103	90 NBR M00109	N 100	17674	●

● Available from stock ○ On request: Tool is available, delivery at short notice

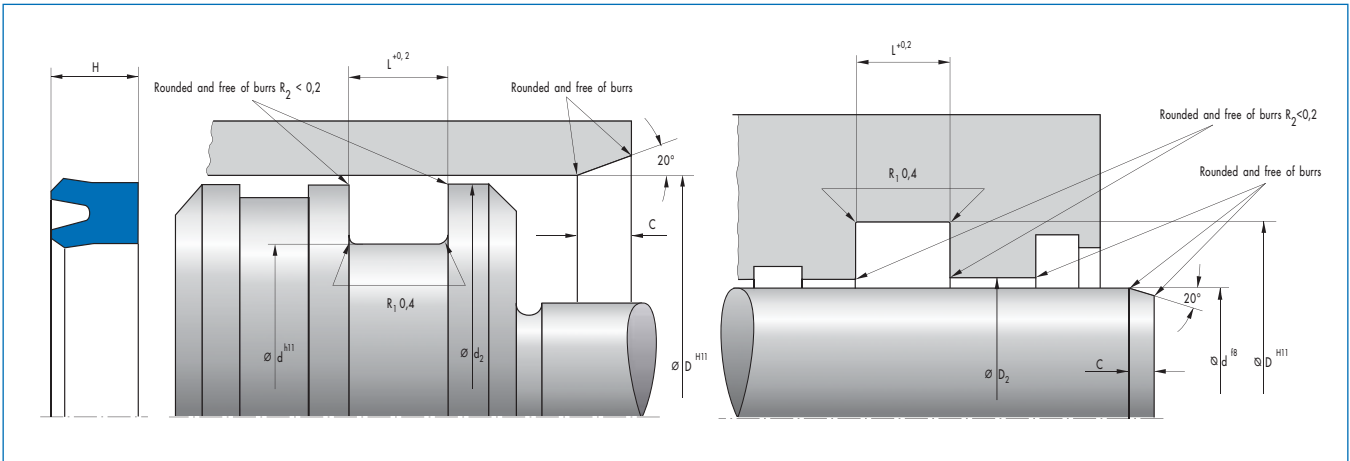


d	D	H	Profile	L	C	Code	Material	Type	Article No.	
55	80	15	12,5	16	6,5	N55-104	90 NBR M00109	N 100	17936	○
60	70	12	5	13	4,5	AUN60-104	94 AU P00925	AUN 100	14411	●
60	75	12	7,5	13	5,5	AUN60-103	94 AU P00925	AUN 100	14365	●
60	80	12	10	13	6	AUN60-107	94 AU P00925	AUN 100	34397	●
60	80	12	10	13	6	N60-101	90 NBR M00109	N 100	16850	●
60	85	15	12,5	16	6,5	N60-102	90 NBR M00109	N 100	17937	○
63	83	15	10	16	6	AUN63-100	94 AU P00925	AUN 100	13532	○
63	83	15	10	16	6	N63-101	90 NBR M00109	N 100	938	●
65	75	12	5	13	4,5	AUN65-108	94 AU P00925	AUN 100	14407	●
65	80	12	7,5	13	5,5	AUN65-105	94 AU P00925	AUN 100	14366	●
65	85	12	10	13	6	AUN65-106	94 AU P00925	AUN 100	14297	●
65	85	12	10	13	6	N65-103	90 NBR M00109	N 100	17667	●
70	80	12	5	13	4,5	AUN70-107	94 AU P00925	AUN 100	14431	●
70	85	12	7,5	13	5,5	AUN70-105	94 AU P00925	AUN 100	14367	●
70	90	12	10	13	6	AUN70-106	94 AU P00925	AUN 100	14322	●
70	90	12	10	13	6	N70-103	90 NBR M00109	N 100	17863	●
70	95	15	12,5	16	6,5	N70-104	90 NBR M00108	N 100	17938	○
75	85	12	5	13	4,5	AUN75-109	94 AU P00925	AUN 100	12185	●
75	90	12	7,5	13	5,5	AUN75-107	94 AU P00925	AUN 100	14368	●
75	95	12	10	13	6	AUN75-102	94 AU P00925	AUN 100	14478	●
75	95	12	10	13	6	N75-106	90 NBR M00109	N 100	18067	●
75	100	15	12,5	16	6,5	N75-105	90 NBR M00109	N 100	16943	○
80	90	10	5	11	4,5	AUN80-102	94 AU P00925	AUN 100	12197	●
80	95	12	7,5	13	5,5	AUN80-108	94 AU P00925	AUN 100	14369	●
80	100	12	10	13	6	AUN80-109	94 AU P00925	AUN 100	14271	●
80	100	12	10	13	6	N80-101	90 NBR M00109	N 100	16974	●
80	100	15	10	16	6	N80-105	90 NBR M00109	N 100	17636	●
80	105	15	12,5	16	6,5	N80-106	90 NBR M00108	N 100	17939	○
85	100	12	7,5	13	5,5	AUN85-104	94 AU P00925	AUN 100	12109	●
85	105	12	10	13	6	AUN85-105	94 AU P00925	AUN 100	14341	●
85	105	15	10	16	6	N85-103	90 NBR M00109	N 100	18019	●
85	110	15	12,5	16	6,5	N85-101	90 NBR M00109	N 100	16997	○
90	105	12	7,5	13	5,5	AUN90-106	94 AU P00925	AUN 100	14370	●
90	110	12	10	13	6	AUN90-107	94 AU P00925	AUN 100	14371	●
90	110	15	10	16	6	N90-104	90 NBR M00109	N 100	17856	●
90	115	15	12,5	16	6,5	N90-102	90 NBR M00109	N 100	17011	●
90	120	18	15	19	7,5	N90-105	90 NBR M00109	N 100	17940	○

● Available from stock ○ On request: Tool is available, delivery at short notice

d	D	H	Profile	L	C	Code	Material	Type	Article No.	
95	110	12	7,5	13	5,5	AUN95-104	94 AU P00925	AUN 100	14372	●
95	115	12	10	13	6	AUN95-105	94 AU P00925	AUN 100	14425	●
95	115	15	10	16	6	N95-102	90 NBR M00108	N 100	17909	●
95	120	15	12,5	16	6,5	N95-103	90 NBR M00109	N 100	17832	○
100	115	12	7,5	13	5,5	AUN100-107	94 AU P00925	AUN 100	14373	●
100	120	12	10	13	6	AUN100-108	94 AU P00925	AUN 100	14286	●
100	120	15	10	16	6	N100-104	90 NBR M00109	N 100	17697	●
100	125	15	12,5	16	6,5	N100-105	90 NBR M00109	N 100	17716	●
100	130	18	15	19	7,5	N100-106	90 NBR M00109	N 100	17825	○
105	125	15	10	16	6	AUN105-102	94 AU P00925	AUN 100	14374	●
105	130	18	12,5	19	6,5	N105-100	90 NBR M00109	N 100	17941	○
110	125	15	7,5	16	5,5	AUN110-105	94 AU P00925	AUN 100	12144	●
110	130	15	10	16	6	AUN110-104	94 AU P00925	AUN 100	14298	●
110	135	18	12,5	19	6,5	N110-102	90 NBR M00108	N 100	17719	●
110	140	18	15	19	7,5	N110-103	90 NBR M00108	N 100	17942	○
115	135	15	10	16	6	AUN115-107	94 AU P00925	AUN 100	14375	●
115	140	18	12,5	19	6,5	N115-105	90 NBR M00108	N 100	17769	●
120	140	15	10	16	6	AUN120-102	94 AU P00925	AUN 100	14311	●
120	145	18	12,5	19	6,5	N120-100	90 NBR M00109	N 100	17779	○
120	150	18	15	19	7,5	N120-101	90 NBR M00109	N 100	17943	●
125	140	15	7,5	16	5,5	AUN125-105	94 AU P00925	AUN 100	12205	●
125	145	15	10	16	6	AUN125-104	94 AU P00925	AUN 100	14386	●
125	150	18	12,5	19	6,5	N125-102	90 NBR M00109	N 100	17944	●
130	150	15	10	16	6	AUN130-106	94 AU P00925	AUN 100	14293	●
130	155	18	12,5	19	6,5	N130-104	90 NBR M00109	N 100	17945	○
130	160	18	15	19	7,5	N130-105	90 NBR M00109	N 100	17853	●
135	155	15	10	16	6	AUN135-105	94 AU P00925	AUN 100	14376	●
135	160	18	12,5	19	6,5	N135-103	90 NBR M00109	N 100	17877	●
135	165	18	15	19	7,5	N135-104	90 NBR M00108	N 100	17946	○
140	160	15	10	16	6	AUN140-103	94 AU P00925	AUN 100	14321	●
140	165	18	12,5	19	6,5	N140-101	90 NBR M00108	N 100	17855	○
140	170	18	15	19	7,5	N140-102	90 NBR M00109	N 100	17947	●
145	165	15	10	16	6	AUN145-102	94 AU P00925	AUN 100	14340	○
145	175	18	15	19	7,5	N145-101	90 NBR M00108	N 100	17949	○
150	170	15	10	16	6	AUN150-101	94 AU P00925	AUN 100	14330	●
150	180	18	15	19	7,5	N150-100	90 NBR M00108	N 100	17760	●
160	180	15	10	16	6	AUN160-104	94 AU P00925	AUN 100	14320	●
160	180	15	10	16	6	N160-105	90 NBR M00109	N 100	15937	●
160	190	22	15	23	7,5	N160-103	90 NBR M00108	N 100	17675	○
170	200	22	15	23	7,5	N170-100	90 NBR M00109	N 100	17721	●
180	200	15	10	16	6	AUN180-101	94 AU P00925	AUN 100	103817	●
180	210	22	15	23	7,5	N180-100	90 NBR M00108	N 100	17708	○
190	210	15	10	16	6	AUN190-102	94 AU P00925	AUN 100	103821	●
190	220	22	15	23	7,5	N190-101	90 NBR M00108	N 100	17736	○
200	230	22	15	23	7,5	N200-102	90 NBR M00109	N 100	17813	○
225	250	18	12,5	19	6,5	N225-101	90 NBR M00108	N 100	17976	○
230	260	22	15	23	7,5	N230-102	90 NBR M00108	N 100	17677	○
270	300	22	15	23	7,5	N270-103	90 NBR M00108	N 100	18078	○
300	330	22	15	23	7,5	N300-102	90 NBR M00108	N 100	17434	○
300	340	20	20	21	11	N300-100	90 NBR M00109	N 100	17216	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	H	Profile	L	C	Code	Material	Type	Article No.	
320	350	16	15	17	7,5	AUN320-100	94 AU P00925	AUN 100	103853	○
320	350	22	15	23	7,5	N320-102	90 NBR M00108	N 100	17734	○
360	390	22	15	23	7,5	AUN360-100	94 AU P00925	AUN 100	103854	○
400	430	25	15	26	7,5	N400-101	90 NBR M00109	N 100	1484	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Cover Seal PU 82

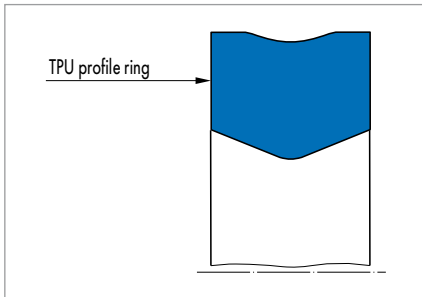


Fig. 1 Merkel Cover Seal PU 82

Product description

Single-piece, double-acting compact seal made from TPU for static sealing, inner sealing.

Product advantages

- Interchangeable for O-ring housings and O-ring with back-up ring
- High reliability
- Simple and secure installation
- Simplified stockkeeping
- Gas proofness.

Application

- Higher operating pressure (up to 60 MPa)
 - Gap for breathing (pipe expansion)
 - Short rate of increase of the pressure (end position damping)
 - Alternating in situ operating pressure
 - Nominal diameter up to 2000 mm.
- Cranes, construction machinery, industrial vehicles, forestry equipment, injection moulding machines, presses, wind power plants.

Material

Material	Code
Polyurethane	95 AU V142/94 AU 925

Operating conditions

Material	95 V142/94 AU 925
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +40
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic ester)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Pressure p in MPa	60

The specified values are maximum values and must not be applied simultaneously.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,8 µm	3,2 µm
Groove base	1,6 µm	6,3 µm
Groove flanks	6,3 µm	20 µm
Lead-in chamfer*	0,8 µm	3,2 µm

* burr-free transition

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

For pressures up to 60 MPa

Nominal Ø d	Borehole	Shaft
≤800	H7	f7
>800	+0,0 +0,1	-0,05 -0,15

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Mode of operation

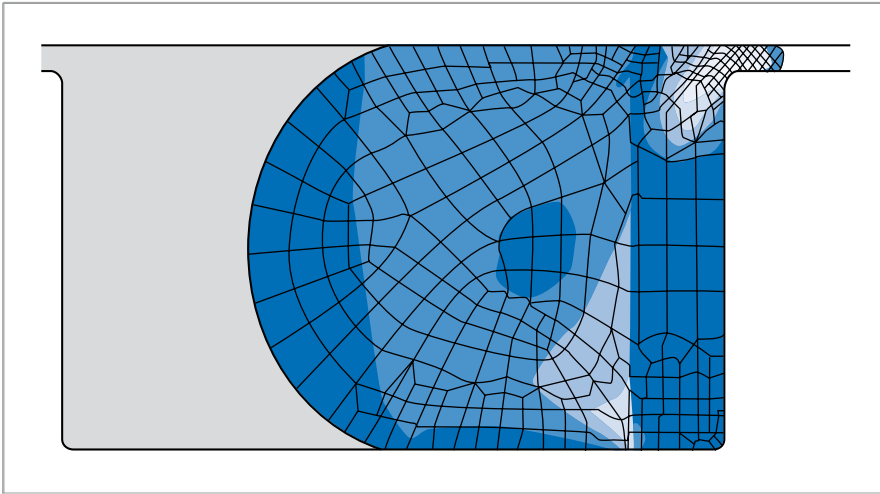


Fig. 2 O-ring with PTFE back-up ring at 40 MPa operating pressure

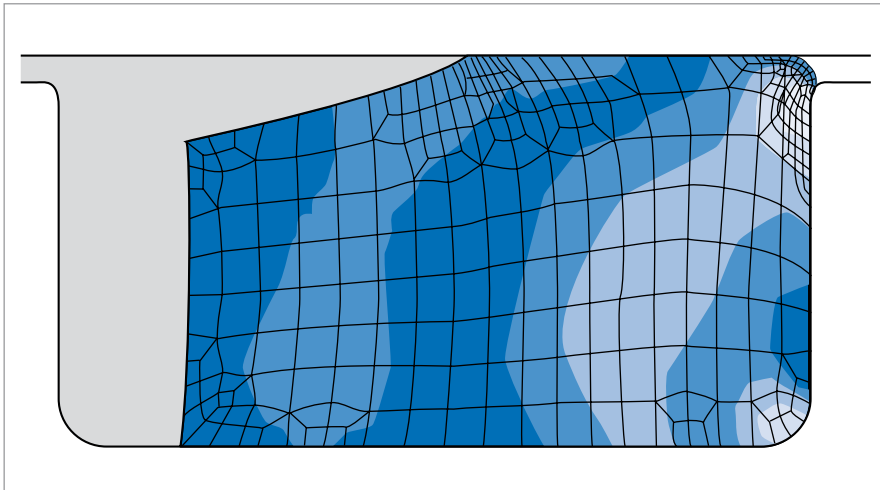
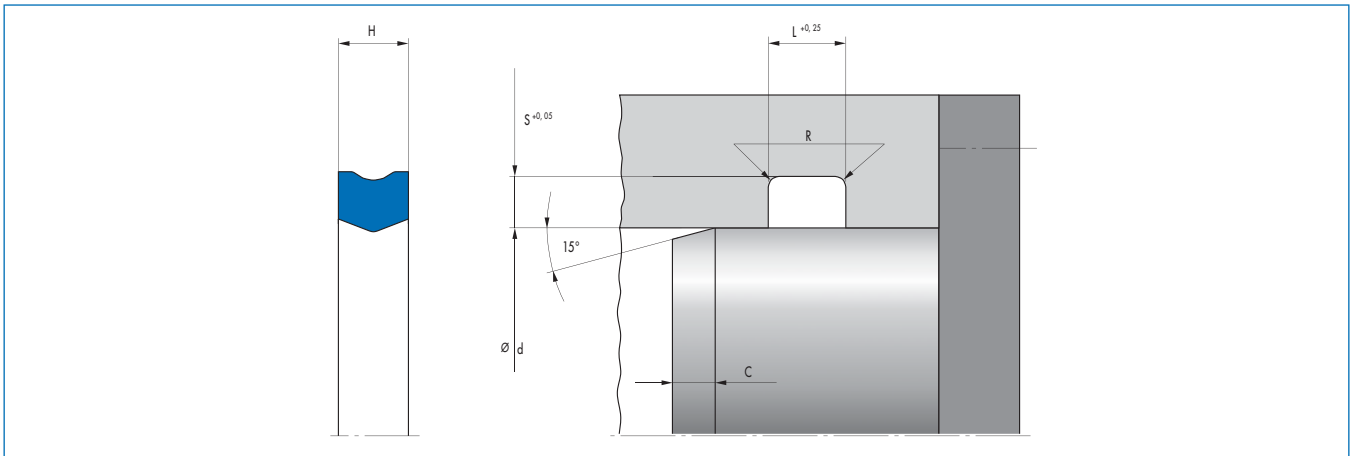


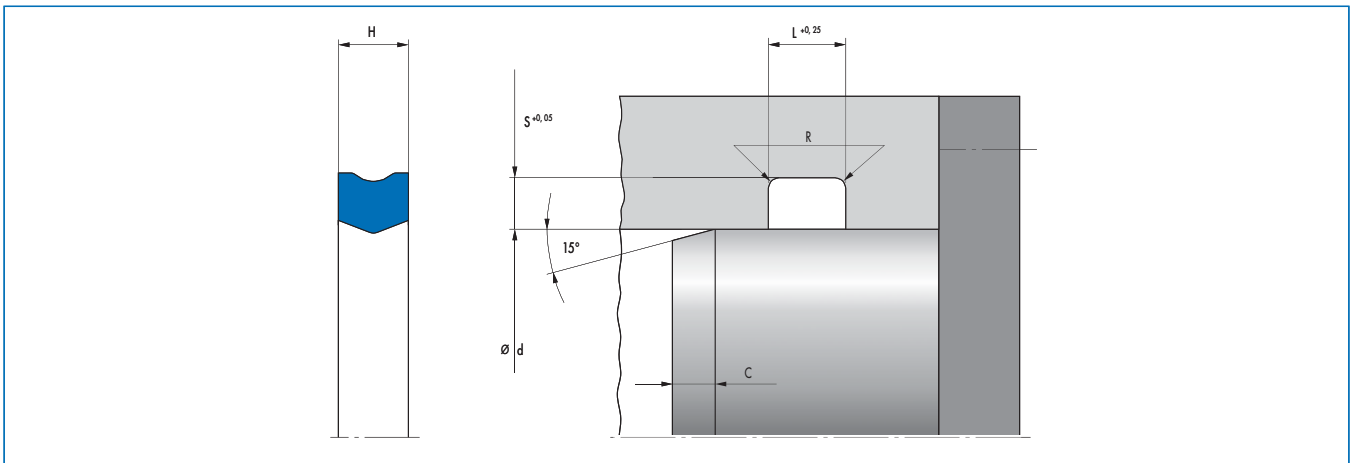
Fig. 3 Cover Seal at 40 MPa operating pressure

Article list



d	D	Profile	H	L	C	ISC O-Ring	Material	Article No.	
16	21	2,5	4,2	5	3	3	95 AU V142	24359080	●
16	22	3	4,3	5	3		95 AU V142	24287685	○
20	24	2	4,1	4,8	2,5	2,5	95 AU V142	49000714	○
25	29,2	2,1	4,1	5	3	2,62	95 AU V142	49014546	○
25	33	4	5,7	6,5	3,5		95 AU V142	24377325	○
30	34	2	4,1	4,8	2,5	2,5	95 AU V142	49000656	○
35	39,5	2,25	3,8	4,5	3	2,62	95 AU V142	24361201	○
40	46	3	2,4	3	3		95 AU V142	24354007	○
50	58	4	5,6	6,4	3,5		95 AU V142	24362417	○
55	60,4	2,7	5,3	6,2	3		95 AU V142	49000660	○
60	65,5	2,8	4,5	5,2	3		95 AU V142	24368756	●
70	75,6	2,8	5,3	6,2	3	3,53	95 AU V142	49004012	○
80	90	5	9,2	10,5	4,5		95 AU V142	49000500	○
90	110	10	10,8	12,3	8		95 AU V142	49018307	○
105	112,8	3,9	5	5,8	3,5		95 AU V142	24354748	○
110	117	3,5	4	4,7	3		95 AU V142	24367583	○
117	123,1	3,05	4,9	5,8	3,5		93 AU V142	24245387	○
120	140	10	10,8	12,3	8		95 AU V142	49018308	○
136	141,9	2,95	4,9	5,8	3,5		95 AU V142	24250882	○
140	145,9	2,95	4,9	5,8	3,5		95 AU V142	49009024	○
149,7	165,5	7,9	11,1	12,7	6,5		95 AU V142	49006190	○
160	168,6	4,3	7,8	9	4	5,33	95 AU V142	24370625	○
170	176,3	3,15	4,9	5,8	3,5		95 AU V142	24250879	○
180	188,6	4,3	7,8	9	4	5,33	95 AU V142	49002910	○
190	201,6	5,8	10,7	12,3	5		94 AU 925	49003461	○
200	208,6	4,3	7,8	9	4		95 AU V142	533208	○
210	221,6	5,8	10,7	12,3	5	6,99	94 AU 925	24379224	○
250	258,6	4,3	7,8	9	4		95 AU V142	49004491	○
270	278,6	4,3	7,8	9	4		94 AU 925	49016834	○
275	286,6	5,8	10,7	12,3	5		94 AU 925	529839	○
280	320	20	17,9	20	15		94 AU 925	49009097	○
300	311,6	5,8	10,7	12,3	5		95 AU V142	49006854	○
320	333,4	6,7	8,6	10	6		95 AU V142	24369684	○
330	341,6	5,8	10,7	12,3	5		94 AU 925	532554	○
360	371,6	5,8	10,7	12,3	5		94 AU 925	49005757	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	Profile	H	L	C	ISC O-Ring	Material	Article No.	
400	411,6	5,8	10,7	12,3	5		94 AU 925	49014554	○
440	451,6	5,8	10,7	12,3	5		94 AU 925	531798	○
540	553,4	6,7	9,3	10,8	6		94 AU 925	49001311	○
790	803,6	6,8	9,2	10,7	6		94 AU 925	527748	○
840	853,6	6,8	9,2	10,7	6		94 AU 925	527749	○
1120	1137	8,5	14,4	16,3	7		94 AU 925	533599	○
1155	1177,4	11,2	12,4	14	9		94 AU 925	24371571	○
1320	1337	8,5	14,4	16,3	7	10	94 AU 925	49001112	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Cover Seal PU 83

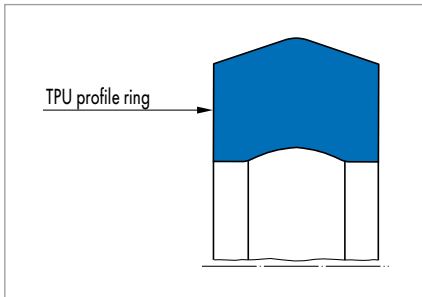


Fig. 1 Merkel Cover Seal PU 83

Product description

Single-piece, double-acting Merkel compact seal made from low temperature polyurethane for static sealing, outer sealing.

Product advantages

- Interchangeable for O-ring housings and O-ring with back-up ring
- High reliability
- Simple and secure installation
- Simplified stockkeeping
- Gas-proof height.

Application

- Higher operating pressure (up to 60 MPa)
- Gap for breathing (pipe expansion)
- Short rate of increase of the pressure (end position damping)
- Alternating in situ operating pressure
- Nominal diameter up to 2000 mm.

Presses, steel industry, wind power plants, cranes, construction machinery, industrial vehicles, forestry equipment, injection moulding machines.

Material

Material	Code
Polyurethane	95 AU V142/94 AU 925

Operating conditions

Material	95 V142/94 AU 925
	Temperature range in °C
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +40
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Pressure p in MPa	60

The specified values are maximum values and must not be applied simultaneously.

Surface quality

Surface roughness	R _a	R _{max}
Sliding surface	0,8 µm	3,2 µm
Groove base	1,6 µm	6,3 µm
Groove flanks	6,3 µm	20,0 µm
Lead-in chamfer*	0,8 µm	3,2 µm

* burr-free transition

Design notes

Please observe our general design notes in → Technical Manual.

Tolerance recommendation

For pressures up to 60 MPa

Nominal Ø D	Borehole	Shaft
≤800	H7	f7
>800	+0,0 +0,1	-0,05 -0,15

Fitting & installation

Careful fitting is a prerequisite for the correct function of the seal.
→ Technical Manual.

Mode of operation

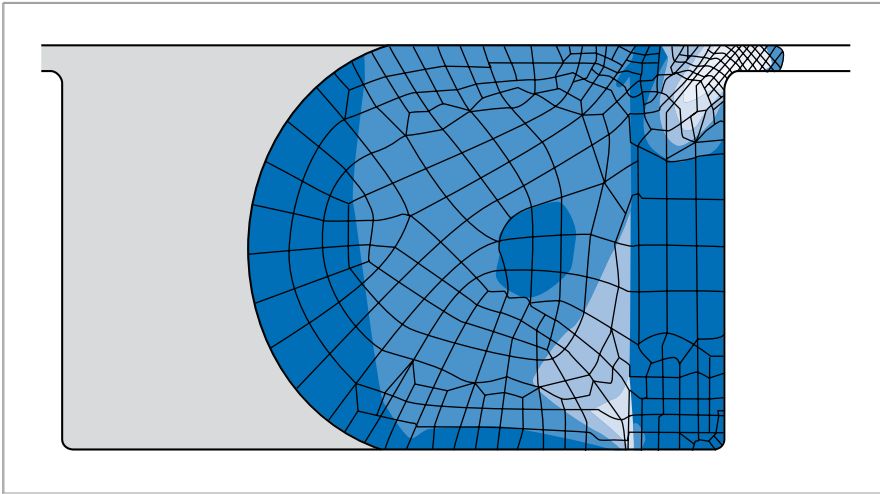


Fig. 2 O-ring with PTFE back-up ring at 40 MPa operating pressure

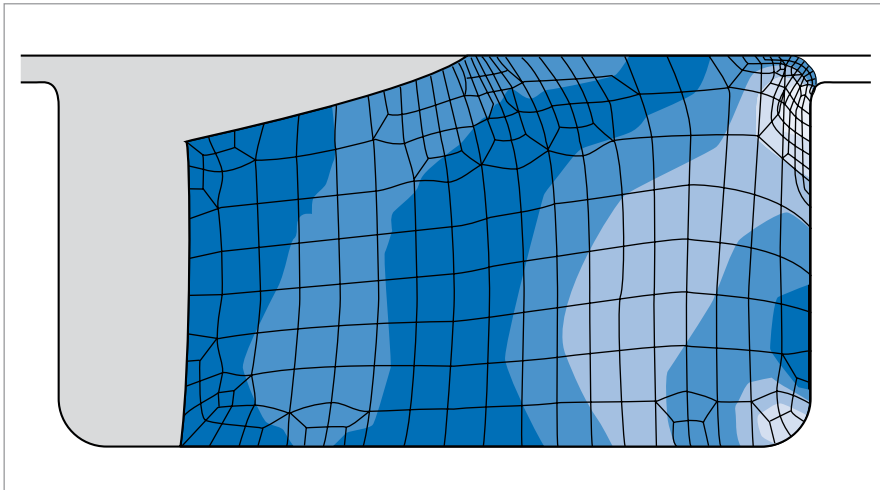
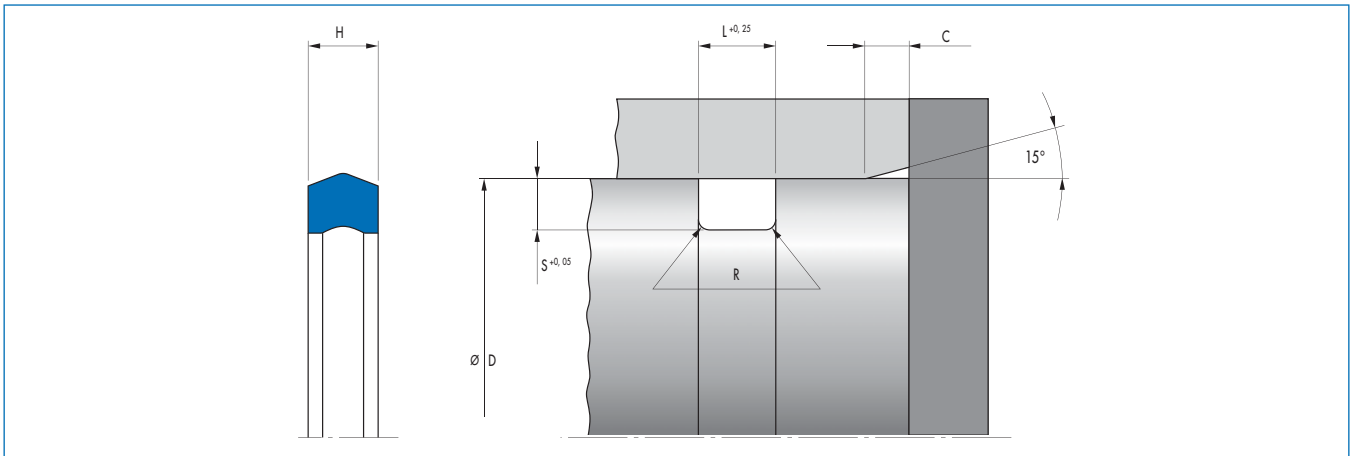


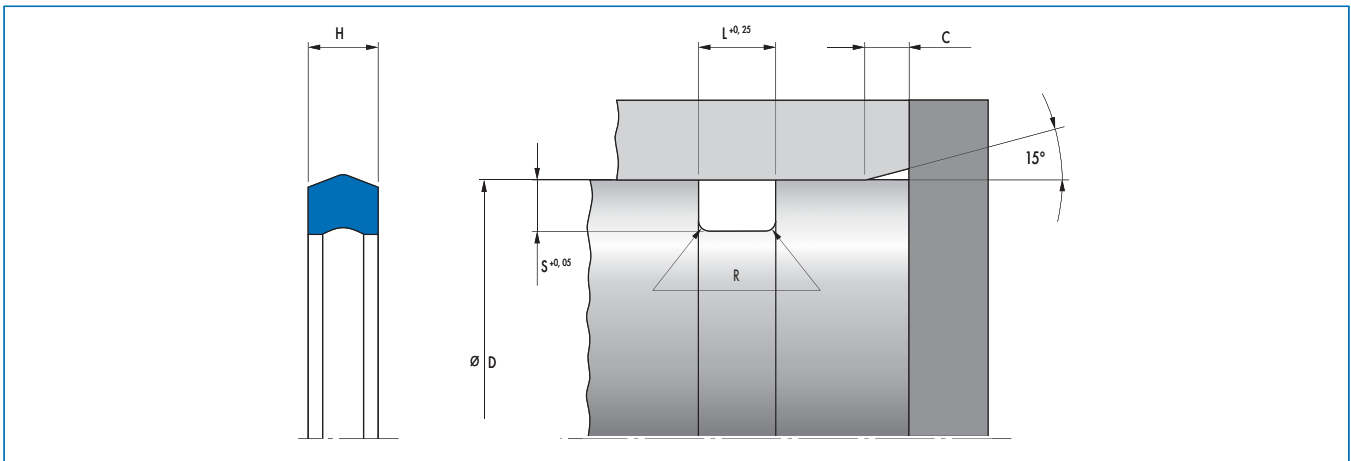
Fig. 3 Cover Seal at 40 MPa operating pressure

Article list



d	D	Profile	H	L	C	ISC O-Ring	Material	Article No.	
32,8	40	3,6	2,8	3,4	3		95 AU V142	24367566	●
42,2	50	3,9	5	5,8	3,5		95 AU V142	24334142	●
44,4	50	2,8	5,3	6,2	3,5	3,53	95 AU V142	532203	○
52,2	60	3,9	5	5,8	3,5		95 AU V142	24327617	●
54	60	3	5,3	6,2	3,5		95 AU V142	49001027	○
54,6	60	2,7	5,5	6,5	3,5		95 AU V142	24380802	●
57,2	65	3,9	5	5,8	3,5		95 AU V142	24327636	●
64,4	70	2,8	5,2	6,2	3,5	3,53	95 AU V142	532201	○
69,6	75	2,7	5,5	6,5	3,5		95 AU V142	24380803	●
73,2	81	3,9	5	5,8	3,5		95 AU V142	24295885	●
80,8	85	2,1	4,2	5	2,5	2,62	95 AU V142	24269861	○
80,1	90	5	6,7	7,8	4		95 AU V142	24362668	●
86,4	95	4,3	7,8	9	4	5,33	94 AU 925	49018330	○
87,7	95,5	3,9	5	5,8	3,5		95 AU V142	24293063	○
90	100	5	7,3	7,8	4		95 AU V142	24362292	●
91,4	100	4,3	7,8	9	4	5,33	95 AU V142	24379356	○
94,4	100	2,8	5,2	6,2	3,5	3,53	95 AU V142	532202	○
95,1	105	5	6,7	7,8	4		95 AU V142	24359847	●
101,4	110	4,3	7,8	9	4	5,33	95 AU V142	24380871	○
105,1	115	5	6,7	7,8	4		95 AU V142	24355287	●
115,6	122	3,2	5,7	6,8	4	4	95 AU V142	49001025	○
115,1	125	5	6,7	7,8	4		95 AU V142	24355288	●
116,4	125	4,3	7,8	9	4	5,33	95 AU V142	24379551	○
120,8	130	4,6	4,2	5	4		95 AU V142	24311962	○
121,4	130	4,3	7,8	9	4	5,33	95 AU V142	528353	○
130,4	140	4,8	6,6	7,7	4		95 AU V142	24362518	○
134,1	140	3	4,9	5,9	3,5		95 AU V142	24245392	●
135	145	5	7,3	8,4	4,5	5,7	95 AU V142	24359031	○
140,4	150	4,8	6,6	7,7	4		95 AU V142	24367348	●
141,9	150	4,1	8	9,2	3,5		95 AU V142	24348854	○
159,2	165	2,9	4,9	5,9	3,5		95 AU V142	24250883	○
170	180	5	7,3	8,4	4,5	5,7	95 AU V142	24378895	○
174,4	180	2,8	5,2	6,2	3,5	3,53	95 AU V142	49001429	○
185,9	192	3,1	4,9	5,9	4		95 AU V142	24250878	○
191,4	200	4,3	7,8	9	4	5,33	95 AU V142	49004492	○
193,9	200	3,1	4,9	5,9	4		95 AU V142	24250880	○

● Available from stock ○ On request: Tool is available, delivery at short notice



d	D	Profile	H	L	C	ISC O-Ring	Material	Article No.	
216,4	225	4,3	7,8	9	4	5,33	95 AU V142	531563	○
228,4	240	5,8	10,7	12,3	5	6,99	95 AU V142	24375294	○
231,4	240	4,3	7,8	9	4	5,33	95 AU V142	24360083	○
236	242	3	4,9	5,9	3,5		95 AU V142	24245390	○
253,4	265	5,8	10,7	12,3	5,5	6,99	95 AU V142	49000175	○
282	288	3	4,9	5,9	4		95 AU V142	24250877	○
463	480	8,5	14,4	16,3	7	10	94 AU 925	49004706	○
643	660	8,5	14,4	16,3	7	10	94 AU 925	49012006	○
715	730	7,5	10,7	12,2	6	8,4	94 AU 925	24360742	○
793	810	8,5	14,4	16,3	7	10	94 AU 925	49015798	○
830	813	8,5	15,6	16,3	7	10	94 AU 925	24361263	○
843	860	8,5	14,4	16,3	7	10	94 AU 925	49015799	○
943	960	8,5	14,4	16,3	7	10	94 AU 925	49012180	○

● Available from stock ○ On request: Tool is available, delivery at short notice

Merkel Stircomatic SRC

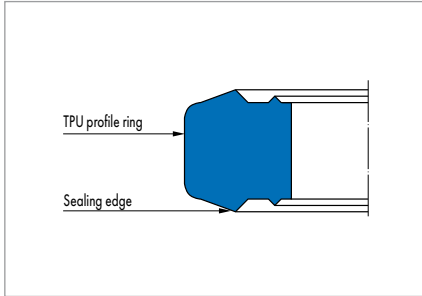


Fig. 1 Merkel Stircomatic SRC

Product description

Static Merkel seal made of a profiled ring with two cutting edge-shaped sealing edges on the front faces.

Product advantages

- Good stress distribution due to the position of the sealing edge in the groove
- Secure seating in the housing for extremely high, pulsating pressure peaks
- Made of extrusion-resistant polyurethane material.

Application

Hydraulic control and regulation equipment, hydraulic hammers.

Material

Material	Code
Polyurethane	95 AU V142

Operating conditions

Material	95 V142
Temperature range in °C	
Hydraulic oils HL, HLP	-30 ... +110
HFA fluids	+5 ... +50
HFB fluids	+5 ... +50
HFC fluids	-30 ... +40
HFD fluids	-
Water	+5 ... +50
HETG (rapeseed oil)	-30 ... +60
HEES (synthetic esters)	-30 ... +80
HEPG (glycol)	-30 ... +50
Mineral greases	-30 ... +110
Pressure p in MPa	80

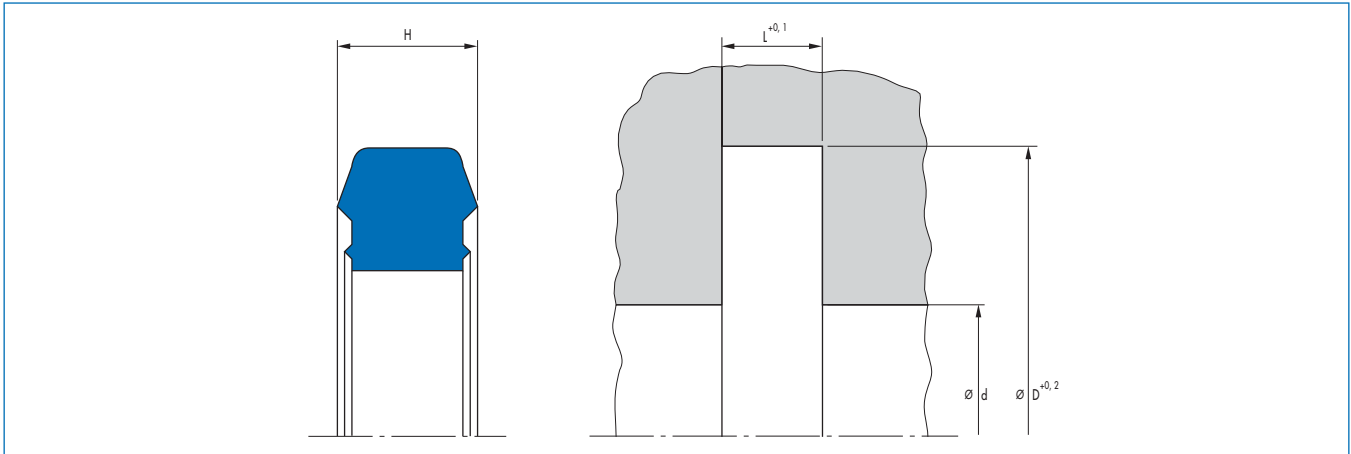
Surface quality

Surface roughness	R _a	R _{max}
Groove base	≤1,8 μm	≤6,3 μm
Groove flanks	≤3,0 μm	≤16,0 μm

Design notes

A spot facing cutter is normally sufficient for the manufacture of a housing. A relatively high degree of roughness on the front face can be permitted. → Technical Manual.

Article list



d	D	H	L	Profile	Material	Article No.	
6	12	2,4	1,9	3	95 AU V142	24350847	●
8	14	2,4	1,9	3	95 AU V142	24350848	●
10	16	2,4	1,9	3	95 AU V142	24350849	●
12	18	2,4	1,9	3	95 AU V142	24350850	●
14	21	2,4	1,9	3,5	95 AU V142	24350851	●
16	23	2,4	1,9	3,5	95 AU V142	24350852	●
20	27	2,4	1,9	3,5	95 AU V142	24350853	●
24	30	2,4	1,9	3	95 AU V142	24354033	●
25	33	3	2,4	4	95 AU V142	24350855	●
30	38	2,4	1,9	4	95 AU V142	24337027	●
32	40	3	2,4	4	95 AU V142	24336213	●
40	48	3	2,4	4	95 AU V142	24343125	●
45	53	3	2,4	4	95 AU V142	49003451	○
50	58	3,1	2,5	4	95 AU V142	24350857	●

● Available from stock ○ On request: Tool is available, delivery at short notice

ISC O-Ring

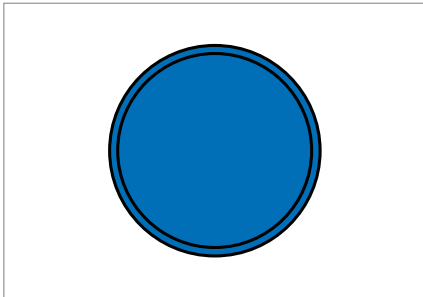


Fig. 1 ISC O-Ring

Product description

ISC O-Rings are endless round sealing rings of circular cross section. They are mainly used to seal stationary machine components – static case – against fluid and gaseous media. In certain conditions, they can also be used as a dynamic sealing component for axial, rotating and oscillating movement.

Product advantages

- In order to cover the widest possible range of technical applications, ISC O-Rings are supplied in various different material qualities:
- All catalogue materials for ISC O-Rings are specified and certified.

Material

Material	Operating parameters range
72 NBR 872	Standard material, which can be used for most applications (mineral oils, mineral oil based hydraulic fluids, static pressures up to approx. 100 bar)
88 NBR 156	Use as 72 NBR 872, but suitable for higher pressures.
80 FKM 610	For chemically aggressive media and high temperatures
70 EPDM 281	For glycol based hydraulic fluids, brake fluid, hot water
Simriz® (70 FFKM 495)	Chlorinated and high polar organic solvents, aromatics, Strong organic and inorganic acids and alkalis

The technical data for the standard materials for ISC O-Ring is specified in the → Technical Manual.

Special materials: for special applications a broad spectrum of other materials is available from Simrit → Technical Manual.

ISC O-Rings made of these materials are not held in stock.

Design notes

The dimensions of an ISC O-Ring are defined by inside dia. d_1 and ring thickness d_2 . These dimensions represent the parameters for the ISC O-Ring. The code for an ISC O-Ring in standard material with inside dia. 20,2 mm and a ring thickness 3 mm is as follows:

ISC O-Ring 20,2-3 72 NBR 872

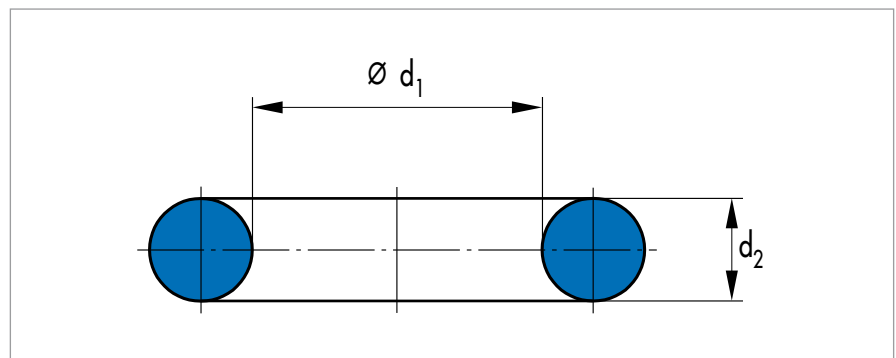


Fig. 2 Drawing with dimensions

Please observe our general design notes in → Technical Manual.

Packaged unit

Delivery in standard packaging units of 5 - 10 - 20 - 50 - 100 units, depending on customer requirements.

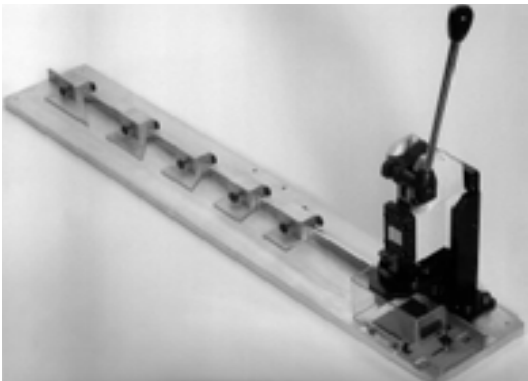
Article list

→ Catalog O-Rings and Static Seals.

Fitting Tools as Mounting Auxiliaries

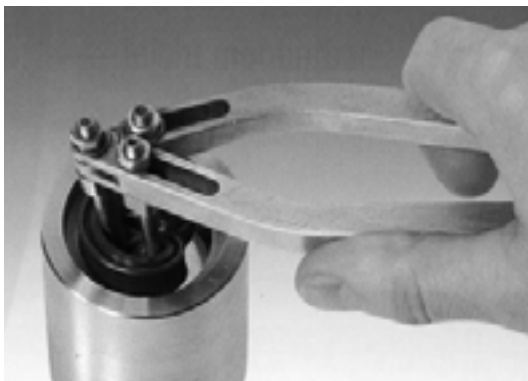
Trimming device

Device for the precise trimming of guide rings (PTFE 40/177024, bronze-filled) up to a length of 1000 mm (corresponds to approx. 320 mm piston or rod diameter). Five different cutting angles are available. A step-cutting blade is available on request.



Order No.: 507228

Fitting pliers for polyurethane rod seals



Order No.: 375753

All fitting devices are supplied with a documentation (work instructions).

Complete toolkits for fitting the seals are available. Please ask for our "complete cylinder service".

Tool for rod seals



On enquiry.

Tool for rod seals for small diameters without axial access



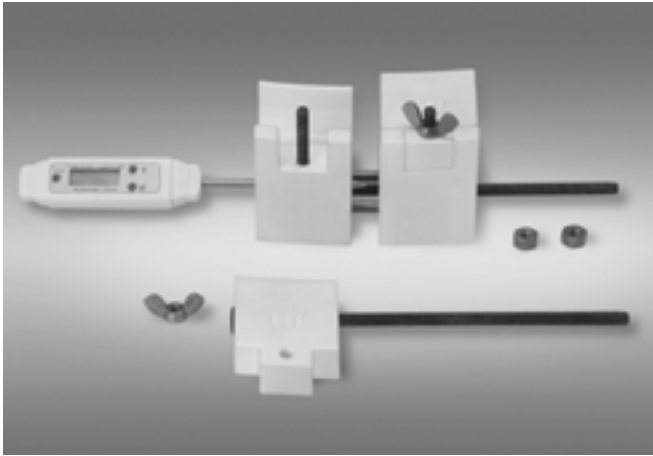
We require a dimensioned installation drawing for delivery.

Tool for piston seals



On enquiry.

Merkel Bonding Set RK 15



Bonding set for Simmerrings without metal insert, for easy and secure installation in open fitting.

Product description

The Merkel bonding set RK 15 makes child's play of seal replacement. The innovative bonding technology allows Radiamatic® Simmerrings to be easily replaced without removal of the shaft and the connected units. Particularly in acute service cases, a short-term availability is guaranteed and includes high operating reliability and long service life of the bonded seal.

Everything needed for easy seal fitting is included in the Merkel Bonding Set RK 15: besides the well thought-out bonding device, the set includes grinding material (grinding sponge medium/hard), cleaning cloths, a digital thermometer and the two-part adhesive.

Product advantages

- Can be replaced without removal of the surrounding components
- Short-term availability
- High operating reliability and long service life
- The bonding set is matched to the diameter of the Radiamatic® Simmerring
- Multiple bondings are possible with the same set.

Catalog Overview

**Clearly laid out and useful:
the new Simrit catalog for
individual offerings**

Quickly and clearly find exactly the right product for your application. Simrit now offers you for every product range a complete reference source for especially easy ordering. Along with the detailed list of items, our catalogs provide valu-

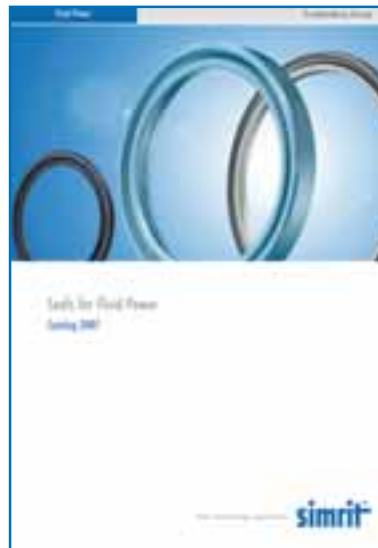
able information on design types, important services and things worth knowing about technology and applications.

Simply order our catalog or Technical Manual now at www.simrit.com.

Simmerrings and Rotary Seals



Seals for Fluid Power



O-Rings and Static Seals



Special Sealing Products



Vibration Control



Technical Manual



Simrit Service Centers and Simrit Partners Worldwide

Europe	Telephone	Fax	E-mail
Austria	+43 (0) 72 42 47 36 10	+43 (0) 72 42 47 36 120	marchtrenk@simrit.at
Belarus	+375 29 645 10 98	+375 17 295 10 98	info@simrit.by
Belgium	+33 (0) 3 20 61 22 64	+33 (0) 3 20 61 22 68	belux@simrit.fr
Czech Republic	+420 2 71 72 21 87	+420 2 71 72 35 63	simrit@simrit.cz
Denmark	+45 (0) 44 92 18 33	+45 (0) 44 92 25 20	info@simrit.dk
Finland	+358 (0) 94 52 01 80	+358 (0) 94 52 01 822	info@simrit.fi
France	+33 (0) 3 85 29 30 00	+33 (0) 3 85 29 30 87	simrit@simrit.fr
Germany	+49 (0) 18 05 74 67 48	+49 (0) 18 03 74 67 48	info@simrit.de
Great Britain	+44 (0) 14 55 20 44 44	+44 (0) 14 55 20 44 55	info@simrit.com
Hungary	+36 1 239 31 40	+36 1 239 31 43	info@simrit.hu
Italy	+39 045 85 17 600	+39 045 85 17 650	vendite@corcos-simrit.it
Norway	+47 64 83 01 70	+47 64 83 01 71	info@simrit.no
Poland	+48 (0) 2 28 33 77 16	+48 (0) 2 28 33 58 97	simrit@simrit.com.pl
Portugal	+34 93 573 87 08	+34 93 570 49 65	simrit.iberica@simrit.es
Rumania	+40 (0) 2 68 32 01 59	+40 (0) 2 68 32 55 90	simrit.brasov@simrit.ro
Russia	+7 495 380 06 50	+7 495 380 06 51	info@simrit.ru
Slovakia	+421 85 44 83 14 59	+421 85 44 83 14 59	info@simrit.sk
Spain	+34 93 573 87 08	+34 93 570 49 65	simrit.iberica@simrit.es
Sweden	+46 (0) 8 70 52 700	+46 (0) 8 83 81 63	info@simrit.se
Switzerland	+41 (0) 1 30 64 42 2	+41 (0) 1 30 27 00 2	info@simrit.ch
Turkey	+90 (0) 216 593 11 18	+90 (0) 216 593 11 18	info@simrit.de
Ukraine	+380 50 352 61 83	+380 44 236 05 43	info@simrit.com.ua

America	Telephone	Fax	E-mail
Brazil	+55 11 4072 8000	+55 11 4075 4635	simritsa@fngp.com
Mexico	+52 442 192 3200	+52 442 221 6319	rzrn@fngp.com
USA	+1 (866) 274 6748	+1 (734) 354 5500	information@simrit.us

Asia	Telephone	Fax	E-mail
China	+86 21 50 36 69 00	+86 21 50 36 63 07	simrit@nfgc.com.cn
India	+91 (0) 11 28 11 79 60	+91 (0) 11 28 11 79 93	sales@sfnindia.com
Japan	+81 45 548 1123	+81 45 545 4759	yosinaba@nok.co.jp
Singapore	+65 (6) 265 32 33	+65 (6) 265 52 42	nacmail@nok.com.sg

Further Simrit Service Centers and Simrit Distributors can be found at www.simrit.com.

www.simrit.com

simrit[®]