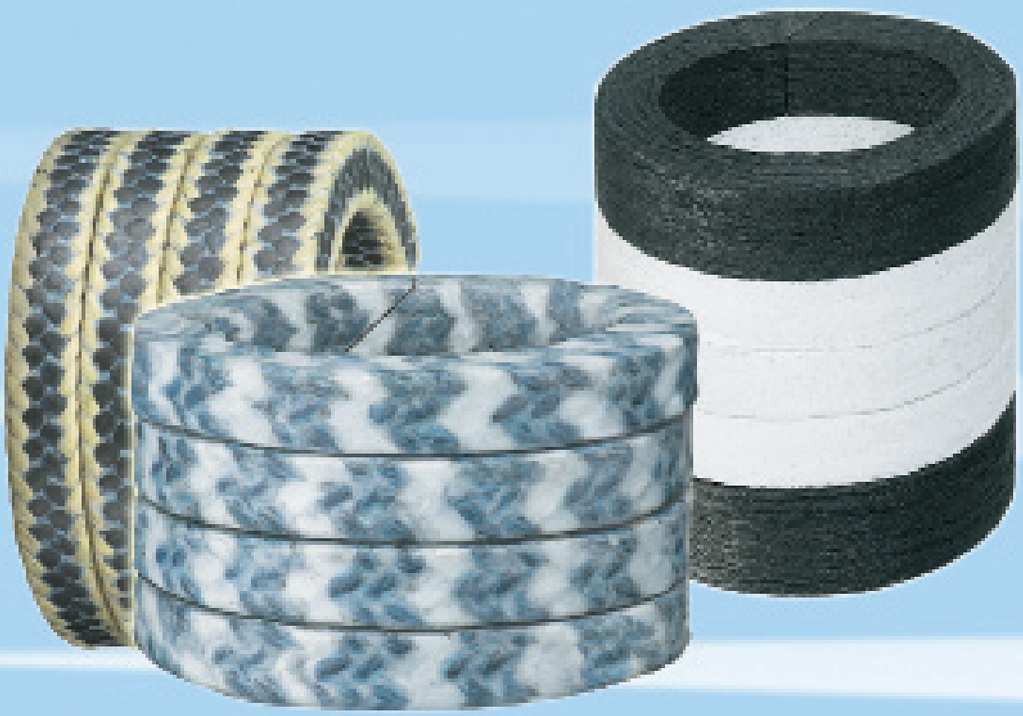

Merkel Standard Packings Range

simrit®

Merkel Freudenberg
Fluidtechnic GmbH

MERKEL

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The figures indicated in the catalog are based on experiences gathered within the Freudeberg Group in the field of research over several decades for the development and manufacture of seals and they are in line with today's state-of-the-art expertise.
However, the sealing effect provided by numerous products mentioned in the catalog is not only generated by the component proper. It is rather based to a very large extent – depending on the specific application involved – on other parameters such as the place of installation and counter rotation, the pressure applied, the operating Temperaturee, the media to be sealed, the lubrication, vibration-related influences and possible dirt from outside. These and further unknown factors are likely to exert a tangible influence on the function of seals in practical applications.
Against this background, no standard statements can be made about the function of the products mentioned in the catalog. The data stated in the latter merely represent general, non-binding reference values which cannot be applied to every case of application. As a result, we recommend that you discuss concrete cases of application with our consulting services.
In the event of higher and special stresses, e.g. exerted by aggressive media, the seal should be selected in cooperation with us, as functional reliability tests are frequently indispensable.

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Environmental protection, improvement in working conditions and increased operational safety are of fundamental importance in the sealing of valves, centrifugal pumps and high-pressure plunger pumps. Correct selection of Merkel packings will ensure these requirements are met.

Thanks to continued material research, the latest in design technology and the most advanced production processes Merkel packings offer superior sealing performance, long service life and the ability to be used in a wide range of applications.

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Pre-Selection Packings Standard Range

Product	Pressure [bar]			Speed [m/s]		Temperature [°C]	pH value
	Rotary pumps	Plunger pumps	Valves	Rotary pumps	Plunger pumps		
Merkel Ramilon 4586	40	1000*		12.5	2	–30 … +120	5 … 11
Merkel Arostat 6204			200			–50 … +250	1 … 13
Merkel Arolan II 6215	25		100	26		–50 … +280	1 … 13
Merkel Arochem S 6216	25	250*		25	2	–50 … +280	1 … 13
Merkel Unistat 6303		800*	250		2	–200 … +280	0 … 14
Merkel Unichem 6313	15			8		–100 … +250	0 … 14
Merkel Unival 6323	25		250	20		–100 … +280	0 … 14
Merkel Alchem 6375		500*	250		2	–200 … +280	0 … 14
Merkel Grafiflex 6501			1000			–200 … +550 [1)] –200 … +700 [2)] –200 … +2500 [3)]	0 … 14
Merkel Grafiflex Cover Seal			1000			–200 … +550 [1)] –200 … +700 [2)] –200 … +2500 [3)]	0 … 14
Merkel Carbosteam 6550			300			–30 … +400 [1)] –30 … +550 [2)]	0 … 14
Merkel G-Spezial 6560			450			–200 … +450 [1)] –200 … +550 [2)]	1 … 14
Merkel G-Spezial S 6565	25		450	25		–200 … +450 [1)] –200 … +550 [2)]	0 … 14
Merkel Uniflex 6588	25			25		–50 … +280	1 … 13
Merkel Kombilon 6742	25			20		–100 … +280	0 … 14
Merkel Univerdit 7000	25*		160*	6		–30 … +250	0 … 14

* most media and air [2)] steam [3)] inert gas * installation with anti-extrusion rings

Ordering note:
Standard packings are supplied by the kilo. The content of the boxes in kg in each case is given in the dimension lists in the kg/box column. Packing can also be supplied as rings on request.

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Merkel Ramilon 4586

Economical packing, ideal for all water pump applications

Product description

Merkel Ramilon is braided from Ramie, an extremely strong and water-resistant natural fibre. The packing also contains a high level of PTFE due to a comprehensive impregnation process. This ensures high density and low friction performance. Merkel Ramilon is also widely used in plunger pumps for high-pressure water applications. The packing is approved for use in the food processing industries.

Application

Rotary pumps, refiner, mills, plungerpumps, stern tubes.

Media

Cold water, drinking water, sea water, warm water, solutions containing solid particles, oils, greases, solvents, foodstuffs

Operating conditions

Pumps		
p	40 bar 1000 bar*	580 psi 14300 psi*
t	-30 ... +120 °C	-22 ... +248 °F
v	12,5 m/s 2 m/s*	2500 ft/min 400 ft/min*
pH	5 ... 11	5 ... 11

* installation with end rings

Product advantages

Extremely wear-resistant	Long service life
Water resistant	Will not swell or rot
Strong yarn	Excellent pressure resistance

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
3	1/8	12	85.5	1	24115932	
4		21	48.1	1	24107608	
5	3/16	33	30.8	1	24107609	
6		47	21.4	1	24107610	
	1/4	52	18.3	1	24121704	
8	5/16	83	12.0	2	24107612	*
	3/8	117	8.5	2	24119759	
10		130	7.7	2	22107613	*
12		187	5.3	3	24107614	*
	1/2	210	4.8	3	24107615	
14	9/16	255	3.9	3	24107616	
15		293	3.4	3	24107617	
16	5/8	333	3.0	3	24107618	*
18		421	2.4	3	24107619	
19	3/4	469	2.1	3	24117489	
20		520	1.9	5	24107620	*
22	7/8	629	1.6	5	24107621	
25	1	813	1.2	10	24113360	*

Also available in die-formed rings and pre-cut lengths.

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Merkel Arostat 6204

Wear-resistant all round packing for static and valve applications

Product description

Merkel Arostat is made from wear-resistant and flexible aramid yarn. The packing is thoroughly impregnated with PTFE.
This results in a very dense and resilient structure making Merkel Arostat particularly ideal for housing and cover lid applications.

Application

Valves

Media

Cold and hot water, steam up to 180 °C, salt solutions, organic solvents, hydro-carbons, oils, greases, diluted acids and alkalis

Operating conditions

Valves		
p	200 bar	2900 psi
t	-50 ... +250 °C	-58 ... +482 °F
pH	5 ... 13	5 ... 13

Product advantages

Highly wear resistant	Can withstand very abrasive media
High content of PTFE impregnation	Improved density and low leakage
Extremely flexible	Minimum maintenance

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
3	1/8	10	101.0	1	24246907	
4		18	56.8	1	24216841	
5	3/16	28	36.4	1	24198908	
6		40	25.3	1	24198907	
	1/4	44	22.6	1	24353539	
8	5/16	70	14.2	2	24198906	*
	3/8	89	10.2	2	24335330	
10		110	9.1	2	24198042	*
12		158	6.3	3	24291198	
	1/2	177	5.6	3	24353564	
14	9/16	216	4.6	3	24224826	
15		248	4.0	3	24233204	
16	5/8	282	3.6	3	24199444	*
18		356	2.8	3	24291163	
19	3/4	397	2.5	3	24262740	
20		440	2.3	5	24250751	*
22	7/8	532	1.9	5	24261064	
25	1	688	1.5	10	24232513	*

Also available in die-formed rings and pre-cut lengths

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Merkel Arolan II 6215

Universal pump packing, especially suitable for abrasive media and shaft deflection

Product description

Merkel Arolan II is made from highly wear-resistant aramid yarn with a special PTFE impregnation and a universally stable running-in lubricant. Its high level of resistance to abrasion as well as to temperature and chemical fluctuations make Merkel Arolan II a universal packing for many industry sectors.

Application

Rotary pumps, valves

Media

Cold and hot water, salt solutions, organic solvents, hydrocarbons, oils, greases, diluted acids and alkalis.

Operating conditions

Rotary pumps		
p	25 bar	362 psi
t	-50 ... +280 °C	-58 ... +536 °F
v	26 m/s	5100 ft/min
pH	1 ... 13	1 ... 13
Valves		
p	100 bar	1450 psi
t	-50 ... +280 °C	-58 ... +536 °F
pH	1 ... 13	1 ... 13

Product advantages

Robust and durable	Suitable for sealing against abrasive media
Extremely wear resistant	Very long service life
Very resilient and flexible	Ideal for sealing against shaft deflection

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
3	1/8	12	84.2	1	24195260	
4		21	47.3	1	24181505	
5	3/16	33	30.3	1	24181506	
6		48	21.0	1	24172093	*
	1/4	54	18.5	1	24180316	*
8	5/16	84	11.8	2	24175041	*
	3/8	120	8.4	2	24175049	*
10		132	7.6	2	24177176	*
12		190	5.3	3	24175522	*
	1/2	213	4.7	3	24175051	*
14	9/16	259	3.9	3	24170381	*
15		297	3.4	3	24175638	
16	5/8	338	3.0	3	24181718	*
18		428	2.3	3	24180328	
19	3/4	477	2.1	3	24178406	*
20		528	1.9	5	24174987	*
22	7/8	639	1.6	5	24188238	
25	1	825	1.2	10	24181719	*

Also available in die-formed rings and pre-cut lengths.

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Merkel Arochem S 6216

Pump packing suitable for high shaft speeds and abrasive media.

Product description

Merkel Arochem S combines the advantages of two advanced yarn materials in the sealing of high-speed shafts. The particular running qualities of thermally stable PTFE-graphite compound yarn ensure shaft protection and even short-term „dry-running" without damage. Due to their stability, wear-resistant aramid yarn edges prevent packing extrusion and protects against abrasive media. Merkel Arochem S contains a universally stable silicone-free lubricant. This ensures superior lubrication during the run-in phase.

Application

Rotary pumps, Plunger pumps

Media

Hot water, salt solutions, alkalis, organic solvents, hydrocarbons, medium concentration acids

Operating conditions

Rotary pumps		
p	25 bar	362 psi
t	-50 ... +280 °C	-58 ... +536 °F
v	25 m/s	4900 ft/min
pH	1 ... 13	1 ... 13
Plunger pumps		
p	250 bar	3625 psi
t	-50 ... +280 °C	-58 ... +536 °F
v	2 m/s	400 ft/min
pH	1 ... 13	1 ... 13

Product advantages

Thermally stable PTFE-graphite compound running surface	Smooth running, low friction
Wear-resistant multi-filament aramid yarn in corners	Anti-extrusion protection and extra stability
Very stable and dense	Ideal for higher pressure/wider clearance gaps

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
5	3/16	38	26.7	1	24258231	
6		54	18.5	1	24233069	
	¼	60	16.5	1	24251376	
8	5/16	96	10.4	2	24232488	
	3/8	135	7.4	2	24242764	
10		150	6.7	2	24232489	*
12		216	4.6	3	24232490	
	½	242	4.1	3	24237883	*
14	9/16	294	3.4	3	24233070	
15		338	3.0	3	24234711	
16	5/8	384	2.6	3	24233071	*
18		486	2.1	3	24239422	
19	¾	542	1.85	3	24242763	
20		600	1.7	5	24232491	*
22	7/8	726	1.4	5	24250804	
25	1	938	1.1	10	24232492	
22	7/8	639	1.6	5	24188238	
25	1	825	1.2	10	24181719	*

Also available in die-formed rings and pre-cut lengths

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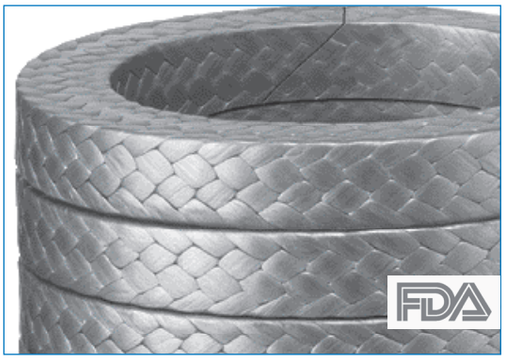
Merkel Unistat 6303

Ideal for control valves and plunger pumps

Product description

Merkel Unistat is manufactured from graphite-filled PTFE yarn. The high level of graphite ensures excellent heat conduction while the PTFE content provides low friction performance. Due to its dense and pressure-resistant structure Merkel Unistat is widely used in plunger pump applications. In addition, its excellent chemical resistance allows for universal use in the chemical industry.
The packing is approved for use in the food processing industries.



Application

Plunger pumps, valves

Media

Steam, condensate, alkalis, solvents, almost all acids.
Exceptions: highly concentrated nitric acid and oleum.
BAM approval for gaseous oxygen (65 bar up to 60 °C; 50 bar up to 200 °C)

Operating conditions

Valves		
p	250 bar	3625 psi
t	-200 ... +280 °C	-328 ... +536 °F
pH	1 ... 14	1 ... 14
Plunger pumps		
p	800 bar	11600 psi
t	-200 ... +280 °C	-328 ... +536 °F
v	2 m/s	400 ft/min
pH	1 ... 14	1 ... 14

Product advantages

Stable PTFE-graphite compound	High chemical and pressure stability
High graphite content	Excellent thermal conductivity
Very dense structure	Low leakage

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
3	1/8	13	76.6	1	24192301	
4		23	43.1	1	24195261	
5	3/16	36	27.6	1	24192302	
6		52	19.2	1	24127129	
	1/4	59	16.8	1	24353543	
8	5/16	93	10.8	2	24183946	*
	3/8	131	7.6	2	24147002	
10		145	6.9	2	24183126	*
12		209	4.8	3	24187294	*
	1/2	234	4.3	3	24147003	
14	9/16	284	3.5	3	24195262	
15		326	3.1	3	24235919	
16	5/8	371	2.7	3	24191302	*
18		470	2.1	3	24195263	
19	3/4	523	1.9	3	24193673	
20		580	1.7	5	24195264	
22	7/8	702	1.4	5	24191529	
25	1	906	1.1	10	24188161	

Also available in die-formed rings and pre-cut lengths

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Merkel Unichem 6313

Rotary pump packing ideal for all chemical media

Product description

Merkel Unichem is made from pure PTFE yarn with an additional PTFE impregnation and lubricant. It has a very dense but soft and pliable structure so that sealing can be achieved with a minimum of gland pressure. Due to its excellent lubrication Merkel Unichem exhibits very low friction. The packing is approved for use in the food processing industries.

Merkel Unichem is also available as a flat tape material for static sealing.*

*Dimensions are available on request

Application

Rotary pumps

Operating conditions

Rotary pumps		
p	15 bar	220 psi
t	-100 ... +250 °C	-148 ... +482 °F
v	8 m/s	1600 ft/min
pH	0 ... 14	0 ... 14

Media

All chemicals including concentrated hot acids and alkalis.
Exceptions: molten alkali metals, fluorine and some fluorine compounds

Product advantages

Very pliable	Provides excellent sealing effect
Very dense when compressed	Very low leakage performance
0-14 pH range	Can be used in all chemical applications

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
3	1/8	15	64.6	1	24107742	
4		28	36.3	1	24107743	
5	3/16	43	23.3	1	24107744	
6		62	16.2	1	24107745	
	1/4	70	14.2	1	24124436	
8	5/16	110	9.1	2	24107746	*
	3/8	156	6.4	2	24121470	
10		172	5.8	2	24107747	*
12		248	4.0	3	24107748	*
	1/2	277	3.6	3	24120009	
14	9/16	337	3.0	3	24116266	
15		387	2.6	3	24117707	
16	5/8	440	2.3	3	24116267	*
18		557	1.8	3	24115577	
19	3/4	621	1.6	3	24266456	
20		688	1.5	5	24115575	*
22	7/8	832	1.2	5	24115576	
25	1	1075	0.9	10	24120976	*

Also available in die-formed rings and pre-cut lengths

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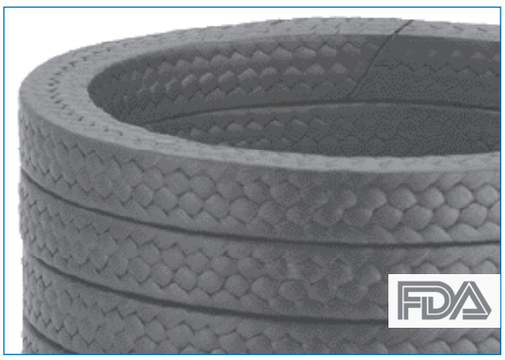
Merkel Unival 6323

Universal packing for high speed/high temperature pumps

Product description

Merkel Unival consists of graphite-filled lubricated PTFE yarn.The special braiding structure offers the benefits of low thermal expansion and excellent heat conduction. Due to its low friction characteristics Merkel Unival can also withstand dry running up to a certain limit. In addition, its pliable and dense composition allows Merkel Unival to seal effectively with a minimum of gland pressure.
The packing is approved for use in the food processing industries.



Application

Rotary pumps, valves

Media

Alkalis, solvents, bitumen, almost all acids.

Exceptions: highly concentrated nitric acid, oleum

Operating conditions

Valves		
p	250 bar	3625 psi
t	-100 ... +280 °C	-148 ... +536 °F
pH	0 ... 14	0 ... 14
Rotary pumps		
p	25 bar	362 psi
t	-100 ... +280 °C	-148 ... +536 °F
v	20 m/s	3900 ft/min
pH	0 ... 14	0 ... 14

Product advantages

Very low thermal expansion	Ability to run at high speeds
Low friction characteristics	Longer service life
Dense and pliable composition	Low leakage with a minimum of gland pressure

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
3	1/8	14	70.3	1	24230131	
4		25	39.6	1	24191207	
5	3/16	40	25.3	1	24187457	
6		57	17.6	1	24186270	
	1/4	64	15.5	1	24188526	
8	5/16	101	9.9	2	24186511	*
	3/8	143	7.0	2	24188537	
10		158	6.3	2	24186500	*
12		228	4.4	3	24186161	*
	1/2	255	3.9	3	24193723	
14	9/16	310	3.2	3	24187392	
15		356	2.8	3	24186570	
16	5/8	404	2.5	3	24188237	*
18		512	2.0	3	24193023	
19	3/4	570	1.8	3	24199600	
20		632	1.6	5	24186633	
22	7/8	765	1.3	5	24191064	
25	1	988	1.0	10	24186194	

Also available in die-formed rings and pre-cut lengths

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Merkel Alchem 6375

Universal chemical valve packing

Product description

Merkel Alchem is manufactured from pure PTFE Yarn with an additional PTFE impregnation, ensuring excellent chemical resistance. Its high density and tight braid structure ensure very low leakage performance. The packing has a high degree of form stability and a low compressibility which makes it also suitable for plunger pump applications. The packing is approved for use in the food processing industries.

Application

Plunger pumps, valves

Media

All chemicals including concentrated hot acids and alkalis
Exceptions: molten alkali metals, fluorine and some fluorine compounds
BAM approved for gaseous oxygen (30 bar up to 60° C)

	Valves	
p	250 bar 500 bar*	3625 psi 7250 psi*
t	-200 ... +280 °C	-328 ... +536 °F
v	2 m/s	400 ft/min
pH	0 ... 14	0 ... 14

* installation with end rings

Product advantages

Particularly tight braid and dense structure	Very low leckage rates
High degree of form stability and compressibility	Very low setting rates
Low soluble chloride content	Suitable for nuclear applications

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
3	1/8	16	1.75	63.49	24107749	
4		28	1.75	35.71	24107750	*
5	3/16	44	1.75	22.86	24107751	*
6		63	1.75	15.87	24107752	*
	1/4	72	1.75	13.95	24115712	
8	5/16	112	1.75	8.93	24107753	*
	3/8	158	1.75	6.33	24117570	
10		175	1.75	5.71	24107754	*
12		252	1.75	3.97	24107755	*
	1/2	282	1.75	3.54	24107756	*
14	9/16	343	1.75	2.92	24116248	*
15		394	1.75	2.54	24116340	
16	5/8	448	1.75	2.23	24107757	*
18		567	1.75	1.76	24117869	
19	3/4	632	1.75	1.58	24192581	
20		700	1.75	1.43	24115579	*
22	7/8	847	1.75	1.18	24115580	
25	1	1094	1.75	0.91	24121883	*

Also available in die-formed rings and pre-cut lengths

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Merkel Grafiflex

Packing rings for high temperature valve applications

Product description

Merkel Grafiflex is characterised by a high level of chemical resistance and thermal stability as well as excellent sealing effect and constant elasticity. Regardless of temperature cycle this material is not subject to cold flow, shrinkage or aging. Merkel Grafiflex fulfills the purity requirements for seals in nuclear power station valves (content of soluble chlorides < 20 ppm).

Merkel Grafiflex rings

Preformed Merkel Grafiflex rings are supplied in densities between 1.4 and 1.85 g/cm³.
Additionally they are available as:

- Merkel Grafiflex Cover Lid seals (see page 15)
- Merkel Grafiflex 6501 with carbon content 98 % or 99,85 %
- Merkel Grafiflex 6561 with carbon content 98 % and PTFE coating
- Merkel Grafiflex 6509 with carbon content 99,85 % and corrosion inhibitor

Merkel Grafiflex tape

Merkel Grafiflex tape is also available as foil material with a unique surface pattern for quick repair service.

Merkel Grafiflex material is approved for use in food, drinking water and oxygen applications.

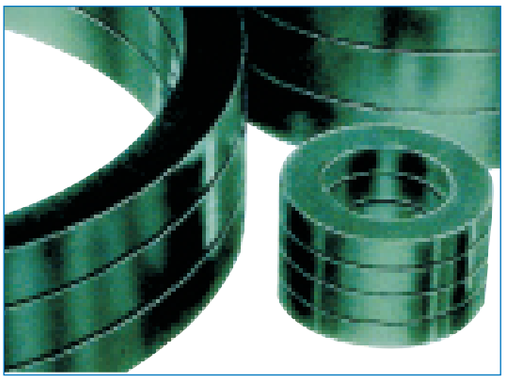
For re-conditioned valves we recommend the combined use of Merkel Grafiflex and Merkel Carbosteam 6550 anti-extrusion rings.

Application

Valves

Media

Hot water and feed water, steam, heat transfer oils, hydrocarbons and many other media
Exceptions: strongly oxidising media
BAM approved for gaseous oxygen (450 bar up to 60° C; 220 bar up to 200° C)



Operating conditions

Valves		
p	1000 bar	14500 psi
t	-200 ... +550 °C[1] -200 ... +700 °C[2] -200 ... +2500 °C[3]	-328 ... +1022 °F[1] -328 ... +1292 °F[2] -328 ... +4532 °F[3]
pH	0 ... 14	0 ... 14

[1] most media and air [2] steam [3] inert gas

Product advantages

Pure expanded graphite	Very high temperature and chemical resistance
Dense and resilient	Excellent sealing effect and constant elasticity
Wide variety of moulds available	Fast delivery without mould charges

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Merkel Grafiflex Cover Lid Seals

Packing rings for high pressure cover seal applications

Product description

Merkel Grafiflex-cover seals are supplied as pre-formed rings and offer proven high performance, especially in heavy-duty valves or high-pressure feedwater preheaters.
Merkel Grafiflex remains elastic even with fluctuating temperatures and pressures up to 200 N/mm². Clearances up to 0.3 mm can be sealed without difficulty.
Larger gaps can be controlled by Merkel Grafiflex reinforced with stainless steel springs or caps integrated into the corners.

Application

Valves

Media

Hot water and feed water, steam, heat transfer oils, hydrocarbons and many other media.
Exceptions: strongly oxidising media.

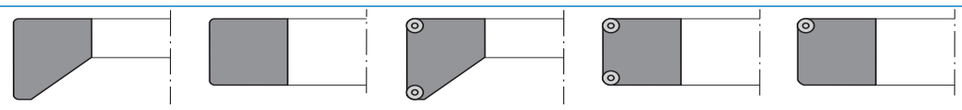
Operating conditions

Valves		
p	1000 bar	14500 psi
t	-200 ... +550 °C[1] -200 ... +700 °C[2] -200 ... +2500 °C[3]	-328 ... +1022 °F[1] -328 ... +1292 °F[2] -328 ... +4532 °F[3]
pH	0 ... 14	0 ... 14

[1] most media and air [2] steam [3] inert gas

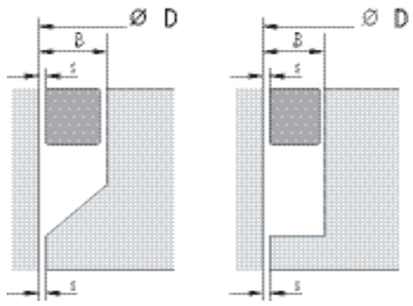
Product advantages

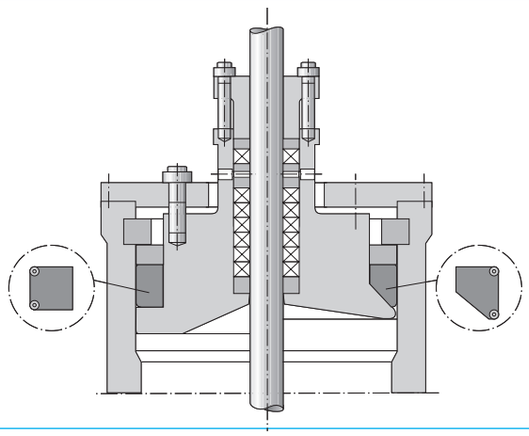
Pure expanded graphite	Very high temperature and chemical resistance
Dense and resilient	Excellent sealing effect and constant elasticity
Incorporated spring insert/caps	Prevents extrusion at high pressures and temperatures
Fast delivery without mould charges	Fast delivery without mould charges



6581 6501 6521 6522 6523

Ø D	B	$S_{(centr.)}$
≤350	≤20	≤0,8
≤350	≥20	≤1,2
>350	≥20	≤0,8
>350	≥25	≤1,2
>350	≥25	≤1,5





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Merkel Carbosteam 6550

High temperature valve packing

Product description

Merkel Carbosteam is made of flexible carbon yarns and a special graphite-based impregnation. Thanks to its excellent thermal stability Merkel Carbosteam is widely used in high temperature steam applications.
Because of its high pressure and extrusion resistance Merkel Carbosteam is ideally used as end rings for Merkel Grafiflex and Merkel G-Spezial and Merkel G-Spezial S.

Application

Valves

Media

Hot water, hot air, steam, acids and alkalis
Exceptions: strongly oxidising media such as hot sulfuric acid and nitric acid

Operating conditions

Valves		
p	300 bar	4350 psi
t	-30 ... +400 °C[1] -30 ... +550 °C[2]	-22 ... +750 °F[1] -22 ... +1022 °F[2]
pH	0 ... 14	0 ... 14

[1] most media and air [2] steam

Product advantages

Thermally stable carbon yarn and impregnation	Very high temperature resistance
High graphite content in impregnation	Reduced friction, longer service life
High strength carbon yarns	Used as anti-extrusion and wiper end rings with Grafiflex or G-Spezial

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
3	1/8	10	101.0	1	24199354	
4		18	56.8	1	24196161	
5	3/16	28	36.4	1	24191670	
6		40	25.3	1	24196568	
	1/4	44	22.6	1	24199357	
8	5/16	70	14.2	2	24191671	*
	3/8	99	10.1	2	24199361	
10		110	9.1	2	24191672	*
12		158	6.3	3	24190391	*
	1/2	177	5.6	3	24199363	
14	9/16	216	4.6	3	24197176	
15		248	4.0	3	24216138	
16	5/8	282	3.6	3	24195492	*
18		356	2.8	3	24199366	
19	3/4	397	2.5	3	24315375	
20		440	2.3	5	24199368	
22	7/8	532	1.9	5	24290307	
25	1	688	1.5	10	24199373	

Also available in die-formed rings and pre-cut lengths

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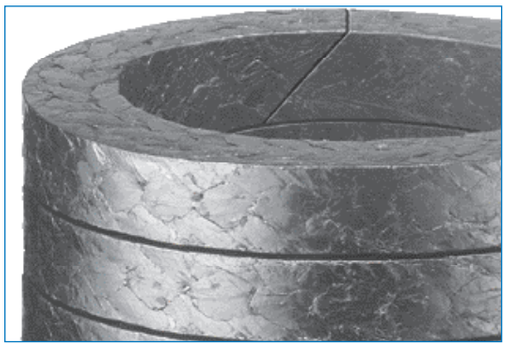
Merkel G-Spezial 6560

General service packing for high temperature steam valves

Product description

Merkel G-Spezial is made from temperature-resistant flexible graphite yarns, reinforced with a thin Inconel wire. This highly pressure resistant braided packing has the same excellent sealing effect as pure die-formed graphite rings.
Merkel G-Spezial is particularly suitable for quick-repair service.
For clearance gaps greater than 0.2mm we recommend the use of Merkel Carbosteam anti-extrusion rings.
Can be used in combination with Merkel Carbosteam end rings for high-pressure valve applications.
Also available with corrosion inhibitor, Merkel G-Spezial I



Application

Valves

Media

Hot water, steam, gases, oils, acids and alkalis
Exceptions: strongly oxidising acids such as sulfuric and nitric acid in high con-centrations

Operating conditions

Valves		
p	450 bar	5800 psi
t	-200 ... +450 °C[1] -200 ... +550 °C[2]	-328 ... +842 °F[1] -328 ... +1022 °F[2]
pH	1 ... 14	1 ... 14

[1]most media and air [2]steam

Product advantages

Pure expanded graphite yarn	High temperature and chemical resistance
Extremely dense when compressed	Very low leakage
Reinforced with Inconel wire	High pressure resistance
Ideal service packing	Quick repair for all valve dimensions

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
4		19	52.1	1	24356667	*
5	3/16	30	33.3	1	24356668	*
6		43	23.10	1	24356669	*
	1/4	49	20.3	1	24377809	
8	5/16	77	13.0	2	24356670	*
	3/8	108	9.2	2	24377978	
10		120	8.3	2	24356671	*
12		173	5.8	3	24356672	*
	1/2	194	5.2	3	24356673	*
14	9/16	235	4.3	3	24356674	*
15		270	3.7	3	24356675	*
16	5/8	307	3.3	3	24356676	*
18		389	2.6	3	24356677	*
19	3/4	433	2.3	3	24356678	
20		480	2.1	5	24356679	*
22	7/8	557	1.7	5	24373834	
25	1	719	1.3	10	24373836	
25	1	1075	0.9	10	24120976	*

Also available in die-formed rings and pre-cut lengths

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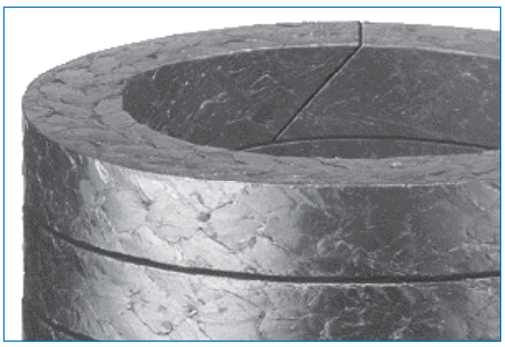
Merkel G-Spezial S 6565

High performance service packing for pumps and valves

Product description

Merkel G-Spezial S is braided from ex-panded pure graphite and is suitable for the use in pump and valve applications. It combines all the advantages of expanded graphite, such as high temperature stability and cross sectional density. Rings from Merkel G-Spezial S can be cut easily from a roll, thus ensuring a prompt repair service.
Can be used in combination with Merkel Carbosteam end rings for high pressure valve applications.



Application

Valves, rotary pumps

Media

Hot water, steam, gases, oils, acids and alkalis

Exceptions: strongly oxidising acids like sulfuric acid and nitric acid in high concentrations

Operating conditions

Pumps/Valves		
p	250 bar	3625 psi
t	-200 ... +450 °C[1] -200 ... +550 °C[2]	-328 ... +842 °F[1] -328 ... +1022 °F[2]
v	25 m/s	4900 ft/min
pH	0 ... 14	0 ... 14

[1] most media and air [2] steam

Product advantages

Pure expanded graphite	Very high temperature and chemical resistance
Dense and resilient	Excellent sealing effect and constant elasticity
Wide variety of moulds available	Fast delivery without mould charges

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
3	1/8	10	96.6	1	70013452	
4		18	54.4	1	00527400	
5	3/16	29	34.8	1	49001846	*
6		41	24.2	2	00527397	*
	1/4	46	21.6	2	00529142	
8	5/16	74	13.6	2	00527398	*
9		93	10.7	2	70013453	
	3/8	104	9.6	2	70013447	
10		115	8.7	2	00527399	*
12		166	6.0	3	00527640	*
	1/2	185	5.4	3	00529143	
14	9/16	225	4.4	3	00527641	*
15		259	3.9	3	70013456	*
16	5/8	294	3.4	3	00527642	*
18		373	2.7	3	00527643	
19	3/4	415	2.4	3	20000200	
20		460	2.2	5	00527644	*
22	7/8	557	1.8	5	70013451	
25	1	719	1.4	10	70013465	*

Also available in pre-cut lengths.

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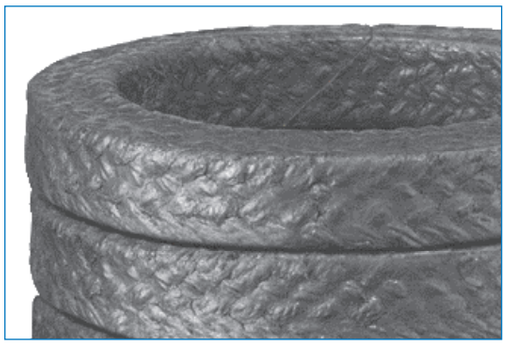
Merkel Uniflex 6588

The ideal general-purpose pump packing

Product description

Merkel Uniflex is manufactured from a carbonised yarn with a special PTFE-graphite impregnation. The packing is very flexible and extrusion-resistant. The impregnation maintains an excellent bond to the yarn over the complete life of the packing. The thermal and volumetric stability provides superior sealing performance with minimal gland compression.
These features make Merkel Uniflex suitable for use in "dry-running" applications.



Application

Rotary pumps

Operating conditions

Pumps		
p	25 bar	362 psi
t	-50 ... +280 °C	-58 ... +536 °F
v	25 m/s	4900 ft/min
pH	1 ... 13	1 ... 13

Media

Cold and hot water, steam, aqueous solutions, diluted acids and alkalis

Product advantages

High carbon content	Very good heat dissipation
Strong, flexible yarn	Extrusion resistant and good resilience
Excellent long-term bond between impregnation and yarn	Long service life, can run "dry" for periods

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
6		48	21.0	1	24374614	
	1/4	54	18.5	1	24374615	
8	5/16	84	11.8	2	24374616	
	3/8	120	8.4	2	24374617	
10		132	7.6	2	24374618	*
12		190	5.3	3	24374619	*
	1/2	213	4.7	3	24374620	
14	9/16	259	3.9	3	24374621	*
15		297	3.4	3	24374622	
16	5/8	338	3.0	3	24374623	*
18		428	2.3	3	24374624	
19	¾	477	2.1	3	24374625	
20		528	1.9	5	24374626	
25	1	825	1.2	10	24374627	
20		480	2.1	5	24356679	*
22	7/8	557	1.7	5	24373834	
25	1	719	1.3	10	24373836	
25	1	1075	0.9	10	24120976	*

Also available in die-formed rings and pre-cut lengths

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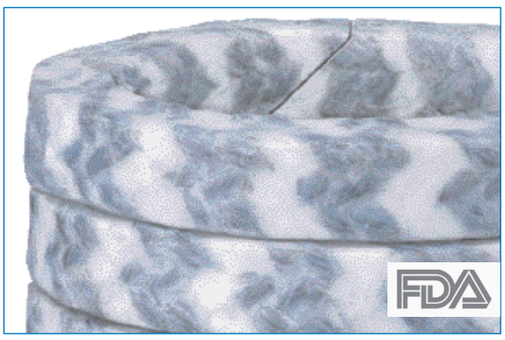
Merkel Kombilon 6742

Ideal for rotary pumps and agitators in the paper and chemical industry

Product description

Merkel Kombilon is an elastic combination braid made from carbon and PTFE yarns. It is impregnated with a special PTFE compound and running-in lubricant.
The unique construction of Merkel Kombilon provides a very low coefficient of friction and exceptional resilience making it ideal for mixer or agitator applications.
The packing maintains its elasticity even after prolonged operation and under high contact pressure. The specially processed carbon yarns ensure excellent flexibility and shaft protection.
The packing is approved for use in the food processing industries.



Operating conditions

Pumps		
p	25 bar	362 psi
t	-100 ... +280 °C	-148 ... +536 °F
v	20 m/s	3900 ft/min
pH	0 ... 14	0 ... 14

Application

Rotary pumps, agitators and mixers

Media

Alkalis, all forms of solvents, alcohols, ketones, esters, oils, acids, hot water, boiler lye, brine, ammonia
Exceptions: strongly oxidising acids

Product advantages

Excellent elasticity and resilience	Low leakage rates even with slight shaft deflection
Very low coefficient of friction	Longer operating life
Good heat dissipation and creep resistance	Excellent performance at higher temperatures

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
4		26	37.9	1	24293761	
5	3/16	41	24.3	1	24293762	
6		59	16.8	1	24293763	
	1/4	68	14.8	1	24327565	
8	5/16	106	9.5	2	24293764	*
	3/8	150	6.7	2	24312110	
10		165	6.1	2	24293765	
12		238	4.2	3	24293766	*
	1/2	266	3.8	3	24302371	*
14	9/16	323	3.1	3	24292346	
15		371	2.7	3	24314668	
16	5/8	422	2.4	3	24293767	*
18		535	1.9	3	24301906	
19	3/4	596	1.8	3	24337151	
20		660	1.5	5	24293768	*
25	1	1031	1.0	10	24299492	

Also available in die-formed rings and pre-cut lengths.

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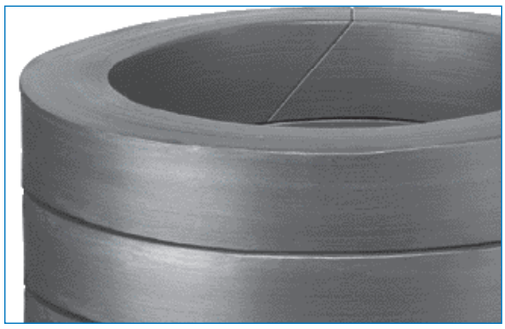
Merkel Univerdit 7000

Special high-density pump and valve packing

Product description

Compact extruded packing made of PTFE graphite compound. Merkel Univerdit has extremely good resistance to gas permeation and has the ability to embed abrasive particles. Merkel Univerdit remains self-lubricating even during extended periods of operation and therefore reduces friction on shafts and spindles. Generally, Merkel Univerdit must always be installed with end rings.*

*End-ring selection dependent on application parameters



Application

Rotary pumps, valves

Media

Alkalis, all forms of solvents, alcohols, ketones, esters, oils, acids, hot water, boiler lye, brine, ammonia
Exceptions: strongly oxidising acids

Operating conditions

Valves		
p	160 bar	2320 psi
t	-30 ... +250 °C	-22 ... +482 °F
pH	0 ... 14	0 ... 14
Rotary pumps		
p	25 bar	362 psi
t	-30 ... +250 °C	-22 ... +482 °F
v	6 m/s	1200 ft/min
pH	0 ... 14	0 ... 14

Product advantages

Very high density	Resistance to gas permeation
Both pliable and volumetrically stable	Easy installation and long service life
Ability to absorb media particles	Ideal for sealing abrasive media
Self-lubricating	Can run „dry“ in some applications

mm	inch	g/m	m/kg	kg/box	Article No.	In stock
3	1/8	16	61.7	1	24139912	
4		29	34.7	1	24115567	
5	3/16	45	22.2	1	24107764	
6		65	15.4	1	24107765	
	1/4	73	13.8	1	24121706	
8	5/16	115	8.7	2	24107766	
	3/8	162	6.2	2	24117922	
10		180	5.6	2	24107767	*
12		259	3.9	3	24107768	
	1/2	290	3.4	3	24117923	
14	9/16	353	2.8	3	24107770	*
15		405	2.5	3	24120253	
16	5/8	461	2.2	3	24107771	
18		583	1.7	3	24115709	
19	3/4	650	1.5	3	24120998	
20		720	1.4	5	24107772	
22	7/8	871	1.2	5	24141641	
25	1	1125	0.9	10	24116047	

Also available in pre-cut lengths.

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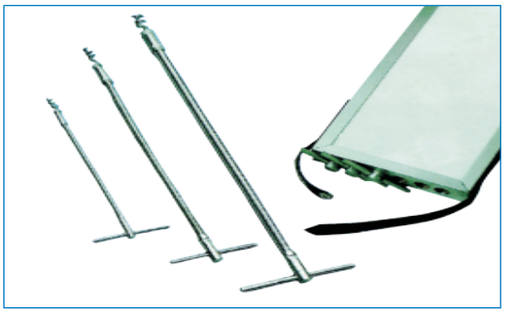
Merkel Fitting Tools

Merkel Packing Extractors 7500

Merkel packing extractors have been developed for rapid and careful removal of old sealing material to provide a clean stuffing box before applying the new packing. They are made from stainless steel. With its flexible and powerful shaft, even packing in difficult to access stuffing boxes of pumps, valves, mixers and other applications are easy to remove.

These extractors are available in four sizes (see table on the right). They can be ordered separately or as a set consisting of a case and extractors in sizes 1, 2 and 3.



Merkel packing extractors			
Size	Length	Installation space	Article no.
3	22 cm	6 mm	24107984
2	33 cm	10 mm	24107985
1	44 cm	13 mm	24107986
0	50 cm	16 mm	24107987
Extractor set (sizes 1,2,3)			24107983

Merkel Ring Segments 7511

For the installation of stuffing box packing, metal ring segments can be screwed onto the Merkel packing extractors making them the ideal tool for pushing the packing evenly into the installation space without damaging the shaft or the housing of the stuffing box.

Merkel ring segments are available in 4 sizes equivalent to the sizes of the Merkel packing extractors.

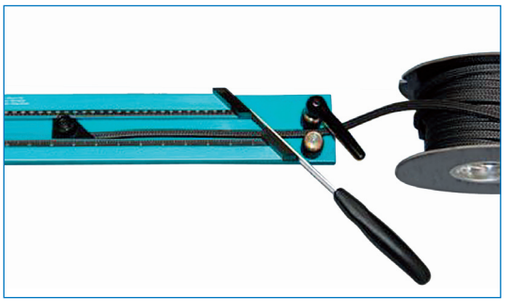
Merkel ring segment	
Size	Article no.
3	24107988
2	24107989
1	24107990
0	24107991

Product advantages

- Flexible shaft for working on hard-to-reach stuffing boxes
- Special manufactured screw for all type and size of stuffing box packing and metal ring segments

Merkel Packing Cutter 7505

The universal packing cutter is designed for the precision cutting of packing materials. With the help of this cutter, precise lengths can be cut from a coil of packing material.



Packing cutter	Article no.
up to 120 mm Ø	70021963
Replacement knife 7513	24122885

Product advantage

- For radial scarf cuts of 45° for shafts and spinles of 5 - 120 mm Ø and 2 to 20 mm packing
- Cross section measuring scale in inches and millimetres
- Clamping device for holding the packing in place
- Finger guard for additional safety quality
- Knife (can be ordered as replacement knife 7513)

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Table of principal media groups

Page		9	8	20	6	11	19	10	12	21	13	7	16	14	17	18
		Merkel packing														
Principal media group		Arochem S 6216	Arolan II 6215	Kombilon 6742	Ramilon 4586	Unichem 6313	Uniflex 6588	Unistat 6303	Unival 6323	Univerdit 7000	Alchem 6375	Arostat 6204	Carbosteam 6550	Grafiflex 6501	G-Spezial 6560	G-Spezial S 6565
1. 1.1	Acids Heavily diluted inorganic and organic acids	■	■	■		■	■	■	■	■	■	■	■	■	■	■
1.2	Concentrated organic acids, inorganic acids (medium concentration)	●	●	■		■	●	■	■	■	■	●	■	■	■	■
1.3	Concentrated inorganic acids			■		■		■	■		■		●	●	●	●
2. 2.1 2.2	Alkalis Diluted alkalis Concentrated alkalis	■	■	■ ■	●	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
3. 3.1	Oils and lubricants Mineral oils and lubricants, plant and animal oils and lubricants	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3.2	Synthetic oils, heat transfer oils	■	■	■			■	■	■		■	■		■	■	■
4.	Other organic compounds (nitriles, amines, lactames)	■	■	■		■	■	■	■		■			■	■	■
5.	Neutral aqueous solutions (salt solutions)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
6.	Solvents (aliphatic and aromatic hydrocarbons, aldehydes, alcohols, esters, ketones, chlorinated hydrocarbons)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
7. 7.1 7.2 7.3	Steam up to 180 °C up to 280 °C up to 550 °C	■ ■		■			■ ■	■ ■	■	■	■ ■	●	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
8. 8.1	Steams and gases Inert gases Air	■	■	■	●	■	■	■	■	■	■	■	■	■	■	■
8.2	Volatile hydrocarbons, solvent steams	■	■	■		■	■	■	■	■	■	■	■	■	■	■
8.3	Sour gases	■	■	■		●	■	■	■	■	■			■	■	■
8.4	Oxygen Hydrogen	■	■	■			■	■ ■	■	■	■	■		■ ■		
9. 9.1	Water Drinking water, sea water, sewage, hot water up to 100 °C	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
9.2	Hot water over 100 °C, boiler feed water	■	■	■	●	■	■	■	■	■	■	●	■	■	■	■

■ suitable ● conditionally suitable

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Media List Keyed to Principal Group

A	
Accumulator acid	1.2
Acetic acid	1.1; 1.2
Acetic acid, glacial	1.1; 1.2
Acetic anhydride	1.1; 1.2
Acetone	6
Acetylene	3.2
Acids of a sulphurous type	1.2
Acrylonitrile	4
Adipic acid	1.1; 1.2
Aircraft fuel	6
Al-Acetate	5
Al-Chloride	1.3
Alum, aqueous	1.1
Aluminium sulphate	2.1
Ammonia, aqueos	2.1; 2.2
Ammonia, gaseous	2.2
Ammonia, liquid	2.2
Ammonium chloride	5
Ammonium sulphate	5
Aniline	4
Antifreeze (motor vehicle)	6
Asphalt	3.1
ASTM oils 1,2,3	3.1
Atznatron/Natron alkali	2.1; 2.2
B	
Barium salts, aqueous	5
Benzaldehyde	6
Benzene	6
Benzoic acid, aqueous	1.1; 1.2
Benzyl alcohol	6
Benzyl chloride	6
Bitumen	3.1
Blast furnace gas	8.2
Boiler feed water	9.2
Borax, aqueous	5
Brake fluid (ATE blue)	3.2
Bromine	2.3
Butadiene	8.2; 6
Butane	8.2; 6
Butanediol	6
Butyl acetate	6
Butyl alcohol	6
Butylene glycol	6
Butyraldehyde	6
Butyric acid	1.1; 1.2
C	
Calcium acetate	5
Calcium bisulphites (alkaline)	5;1.1
Calcium chloride, aqueous	5
Calcium hydroxide, aqueous	2.1
Calcium hypo-chloride	1.1; 1.2
Camphor	4
Caprolactam	4
Carbon dioxide (gas)	8.1
Carbon monoxide	3.1
Carbon tetrachloride	6
Caustic potash	2.1; 2.2
Chlorinated paraffin	3.2
Chlorine water RT	1.2; 1.3
Chlorine, wet	8.3
Chlorobenzene	6
Chloroform	6
Chlorsulphonic acid	1.1; 1.2
Chromic acid	1.1; 1.3
Citric acid	1.1; 1.2
Coconut oil	3.1
Cod-liver oil	3.1
Coke-oven gas	8.1
Copper chloride, aqueous	5
Copper sulfate, aqueous	5
Cresylic acid	6
Crude oil	3.2
Cupric acetate, aqueous	5
Cyclohexane	6
Cyclohexanol	6
Cyclohexanone	6
D	
Diamide, hydrazine	2.1; 2.2
Dibenzyl ether	6
Dibutyl ether	6
Dibutyl phthalate	6
Dichlorethane	6
Diesel oil	3.1
Diethanolamine	4
Diethyl ether	6
Diethyl sebacate	6
Diethylene glycol	6
Dimethylformamide	6
Dioctyl phthalate	6
Diphenyl oxide	6
Diphyl	3.2
Dowtherm A	3.2
E	
Ethane	8.2
Ethanolamine	4
Ethyl acetate	6
Ethyl alcohol	6
Ethyl benzene	6
Ethyl chloride	6
Ethylene	8.2
Ethylene chloride	6
Ethylene glycol	6
Ethylene oxide	8.2
F	
Faecal matter	9.1
Fatty acids	1.1; 1.2
Fatty alcohol	6
Ferric sulphate, aqueous	5
Fixing bath	2.1
Fluorine, dry	8.3
Fluorobenzene	6
Fluorosilicic acid	1.1; 1.2
Formaldehyde	6
Formic acid	1.1; 1.2
Freon types	6
Frigen types	6
Furnace gas, dry	8.2; 8.3
G	
Gas oil	3.1
Gelatine	5
Glaubers salt, aqueous (sodium sulphate)	5
Glue, aqueous	5
Glycerine	6
Glycol	6
Greases	3.1
Groundnut oil	3.1
Group H, HL, H-LP	3.1; 3.2
H	
Heat transfer oil	3.2
Heating oil	3.1
Heptane	6
Hexane	6
Hydraulic fluids/mineral oil based	3.1
Hydraulic fluids/phosphate ester based	3.2
Hydrobromic acid	1.1; 1.2
Hydrochloric acid	1.1; 1.3
Hydrocyanic acid	1.1; 1.2
Hydrogen chloride gas	8.3
Hydrogen peroxide	5
I	
Iodine, tincture	6
Iodine-potassium iodide, aqueous	5
Iron nitrate	1.1
Iron-III-Chloride, aquous	5
Isobutanol alcohol	6
Isobutyl ketone	6
Isooctane	6
Isopropanol	6
Isopropyl acetate	6
Isopropyl ether	6
L	
Lactic acid	1.1
Lauryl alcohol	6
Lead acetate, aqueous	5
Lithium chloride	5

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M	
Magnesium chloride	5
Magnesium hydroxide	2.1; 2.2
Magnesium sulphate	5
Maleic acid	1.1; 1.2
Maleic anhydride	1.2
Methacrylic acid methyl ester	6
Methane	8.2
Methanol	6
Methyl ethylketone (MEK)	6
Methyl glycol acetate	6
Methyl isobutyl ketone	6
Methylene chloride	6
Milk of lime	2.1; 2.2
Mineral oil	3.1
Monobromobenzene	6
Monochloracetic acid	1.2; 1.3
Monochloracetic acid	1.2; 1.3
N	
Naphta	6
Naphtaline	6
Natural gas	8.2
Nickel sulphate	5
Nitric acid	1.2; 1.3
Nitrobenzene	6
O	
Oleum	1.3
Oxalic acid	1.1; 1.2
Oxygen, gaseous	8.4
P	
P3® alkali	2.1; 2.2
Palmitic acid	1.1
Paper pulp	5
Paraffin	3.1
Paraffin oil	3.1
Pentane	6
Perchlorethylene	6
Perchloric acid	1.2; 1.3
Petrol	3.1
Petroleum	3.1
Petroleum ether	6
Phenol, aqueous	1.1; 1.2
Phosphoric acid	1.1; 1.2
Phthalic acid	1.1; 1.2
Phthalic anhydride	1.1; 1.2
Pine needle oil	3.1
Potassium acetate, aqueous	5
Potassium bromide, aqueous	5
Potassium carbonate, aqueous	2.1
Potassium chlorate, aqueous	5.2
Potassium chloride, aqueous	5
Potassium cyanide, aqueous	5
Potassium hydroxide	2.1; 2.2
Potassium nitrate, aqueous	5
Potassium silicate, aqueous	5
Propane	8.2
Propanol	6
Propyl acetate	6
Propylene glycol	6
R	
River acids, concentrated	1.2; 1.3
S	
Salicylic acid	1.1; 1.2
Sea water	9.1
Sea/lake water (salt water)	9.1
Silicone oil	3.2
Silver nitrate, aqueous	5
Soap solution	5
Sodium carbonate	2.1
Sodium chloride	5
Sodium cyanide	5
Sodium hypochlorite	1.1; 1.2
Sodium nitrite	5
Sodium phosphate	5
Sodium silicate	5
Sodium sulphate	5
Sodium sulphide	5
Sodium sulphite	5; 1.1
Sodium thiosulphate	5
Soluble sodium	5
Steam	7
Steam up to 180 °C	7.1
Steam up to 280 °C	7.2
Steam up to 600 °C	7.3
Stearic acid	1.1
Sulphite alkali	2.1; 2.2
Sulphur dioxide	8.3
Sulphuric acid	2.1; 2.2
T	
Tallow	3.1
Tannic acid	1.1; 1.2
Tannin	1.1
Tar	3.1
Tartaric acid	1.1; 1.2
Tetrahydrofurane	6
Toluene	6
Town gas	8.2
Tributyl phosphate	1.2; 1.3
Trichloracetic acid	1.2; 1.3
Trichlorethylene	6
Triethanolamine	4
Turpentine	6
U	
Urea, aqueous	5
V	
Vinyl acetate	6
Vinyl chloride, aqueous	4
W	
Waste water	9.1
Water, boiler feed water	9.2
Water, cold	9.1
Water, sea water	9.1
Water, up to 100°	9.1
Wood pulp	5
X	
Xylene	6
Z	
Zinc chloride	1.1
Zinc sulphate	1.1

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Standardisation Proposals

These proposals are guidelines only. For further advice please contact our Technical Department

Type of industry	Media	Pumps, Agitators, etc.									Valves					
		Arochem S 6216	Arolan II 6215	Kombilon 6742	Ramilon 4586	Unichem 6313	Uniflex 6588	Unistat 6303	Unival 6323	Univerdit 7000	Alchem 6375	Arostat 6204	Carbosteam 6550	Grafiflex 6501	G-Spezial 6560	G-Spezial S 6565
Breweries	Mash				■			■								
	Wort				■			■								
	Water				■			■								
	Beer				■			■								
	Brine				■			■								
	Washing solution				■			■								
	Ammonia				■			■								
	Steam								■			■	■	■	■	■
Chemical industry in general	Alkalis	■	■	■		■	■	■	■		■					
	Inorganic acids			■		■		■	■		■					
	Organic acids	■	■	■		■	■	■	■		■					
	Crystalline media									■	■					
	Hardening media									■	■					
	Halogens			■		■	■		■	■	■					
	Solvents: aliphatic				■			■			■					
	arom. and chlori-nated				■			■			■					
	Alcohols	■	■		■		■	■			■					
	Esters	■	■		■		■	■			■					
	Ketones	■	■		■		■	■			■					
	Oils and greases	■	■		■		■	■			■					
	Water (incl. waste)	■	■		■		■	■			■					
	Steam												■	■	■	■
Paint industry	Greasing oils				■						■					
	Solvents				■						■					
	Dispersion paints				■						■					
	Synthetic resin paints				■					■	■					
Power stations	Boiler feed water			■			■		■			■				
	Condensate	■	■		■		■					■				
	Cooling water	■	■		■		■					■				
	River water	■	■		■		■					■				
	Steam												■	■	■	■

■ type of packing

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Type of industry	Media	Pumps, Agitators, etc									Valves					
		Arochem S 6216	Arolan II 6215	Kombilon 6742	Ramilon 4586	Unichem 6313	Uniflex 6588	Unistat 6303	Unival 6323	Univerdit 7000	Alchem 6375	Arostat 6204	Carbosteam 6550	Grafiflex 6501	G-Spezial 6560	G-Spezial S 6565
Paper industry	Fibrous water				■		■					■				
	Pulp				■		■					■				
	Drum water				■		■					■				
	Condensed water				■		■					■				
	Screening water				■		■					■				
	Waste water				■		■					■				
	Liquors	■	■									■				
	Steam												■	■	■	■
Refineries	Crude oil	■	■								■	■				
	Aliphatic hydro-carbons	■	■				■				■	■				
	Aromatic hydro-carbons	■	■				■				■	■				
	Chlorinated hydrocarbons	■	■				■				■	■				
	Bitumen	■	■	■		■	■		■		■	■				
	Heat transfer oils											■				
	Steam												■	■	■	■
	Organic acids			■		■	■		■							
	Inorganic acids			■		■	■		■		■	■				
	Chlorine			■		■	■		■		■					
	Caustics			■		■	■	■	■		■	■				
Pulp industry	Boiler liquids:			■		■	■	■	■		■	■				
	pH 1-3			■		■		■	■							
	pH 13-14			■		■		■	■							
	Chlorine dioxide			■		■		■	■							
	Sulfite water			■		■		■	■							
	Hypochlorite			■		■		■	■							
	Hydrochloric acid						■			■						
	Fibre suspension									■			■	■	■	■
Cement industry	Steam				■		■			■		■				
	Muds				■							■				
Sugar industry	Water				■					■		■				
	Water (with sand)				■					■		■				
	Juice				■					■		■				
	Lime milk				■					■		■				
	Skimming froth				■							■				
	Sugar juice, mo-lasses												■	■	■	■

■ type of packing

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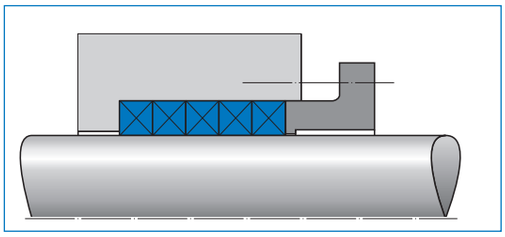
Application examples

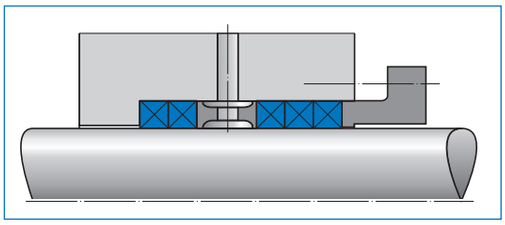
Here are various examples of basic packing applications

Basic design of a stuffing box



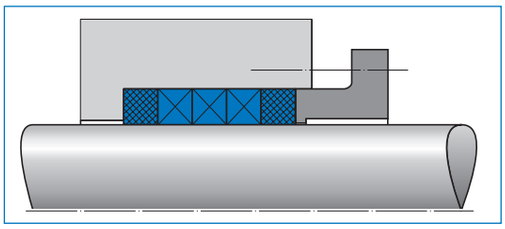
General application for valves, centrifugal and plunger pumps

Stuffing box with lantern ring



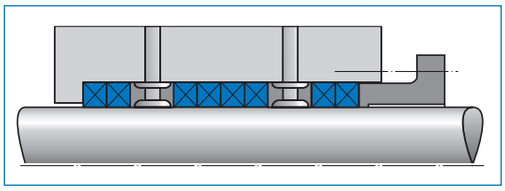
- For lubrication
- For sealing at high pressure (greater than pump pressure)
- For sealing at negative pressure (leakage suction)
- For cooling

Stuffing box with different types of packings



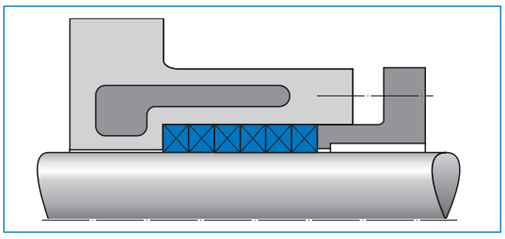
- For protection of a plastic type packing, braided packing is used as anti-extrusion ring
- Highly precompressed rings for bridging large extrusion gaps
- High-density spacer rings as replacement for metal guides

Stuffing box with two lantern rings



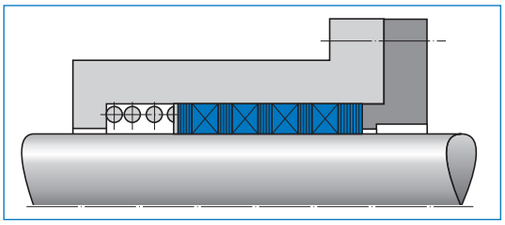
- First ring for high-pressure lubrication, second ring for suction
- Sealing with different media

Stuffing box with cooling manifold



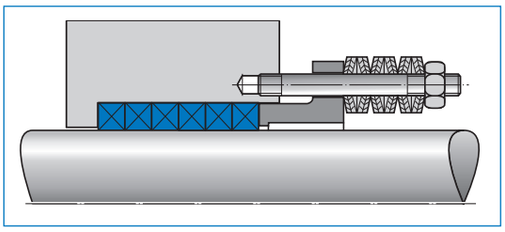
For shaft seals with media boiling point below operating temperature

Stuffing box with inside spring



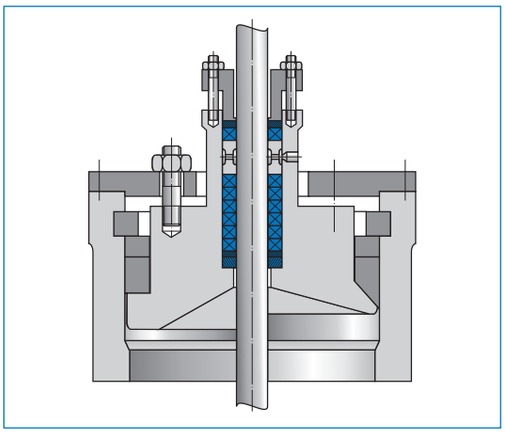
Predominantly on high-pressure plunger pumps (Spring adjustment only to ensure a preliminary seal)

Stuffing box with outside spring



Maintenance-free sealing. Spring load must exceed pressure of medium by ring surface area!

Self-sealing end cover with highly compressed Grafiflex rings



Application e. g. Bredtschneider-Uhde system

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Installation guides

To pack a stuffing box either "cut to size" or use die-formed rings. Use the Merkel packing cutter for an exact length and form a ring around the shaft or spindle. If no tool is available simply wind the packing around a shaft or pipe of correct diameter and cut. A diagonal cut helps to produce a better sealing effect than a straight cut. When cutting packings that tend to fray, place adhesive tape over the area to be cut and then cut through the tape.

Install each ring into the stuffing box bore, ensuring the ends are placed together and first introduced followed by the rest of the ring. Also ensure the joints are placed 90° to each other. The packing should initially be tightly compressed so that it will mould and seat itself in the stuffing box. The gland nuts should then be loosened and retightened to a medium setting.

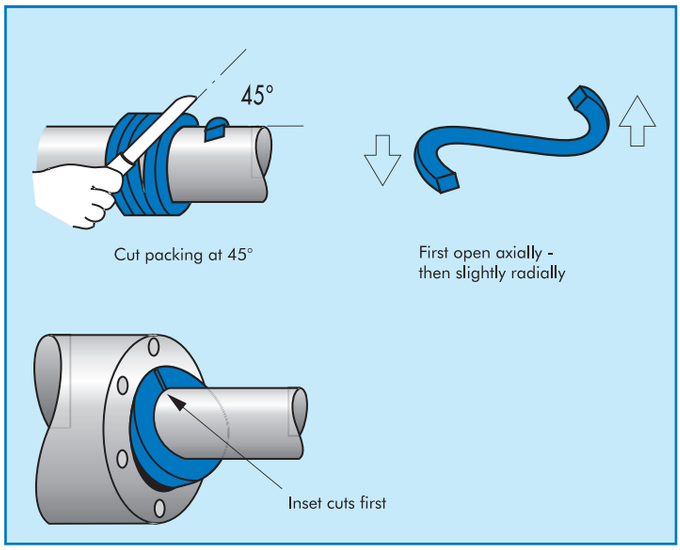
Pump packings
Pump packings are applied with a gland pressure of 1.05 to 2.0 times the pressure of the medium. However, a minimum pressure of 0.5 to 1.5 N/mm2 is necessary.

Valve packings
Valve packings are applied with a gland pressure of 2 to 5 times medium pressure and a minimum pressure of 5 N/mm². Please consult our technical advisory service for the correct values.

"Running in" new packings
Pump packings are particularly susceptible to damage through high temperature during the run-in period. Therefore it is important to pay special attention to the shaft temperature during the run-in phase. If the packing runs too hot the pump must be stopped. After a short cooling down period a regular drip should appear and the pump can then be restarted. It may be necessary to repeat this procedure several times until regular leakage appears.

Installing pre-moulded rings
Pre-moulded rings with exact dimensions should be handled with particular care in order to retain the advantages that these rings offer. If the rings have to be opened to fit onto the shaft then the ring ends should be opened axially only enough to fit the ring over the shaft. Bending the ring radially deforms the ring and makes installation more difficult.

Tolerances and surface finishes
The surface finish should not exceed the following values:
Centrifugal pump shafts, plun-gers and spindles
Ra< 0.25 μm
Stuffing box bores Ra< 2.5 μm
These values are for general applications. For increased sealing effect and longer service life the Ra values should be reduced to Ra< 0.1 μm.
The permissible eccentricity on centrifugal pumps should be less than 1/1000 of the shaft dia-meter. In the interest of reduced Leckage leakage the eccentricity must not exceed 1/100 of the packing



Gap width
The permissible extrusion gaps between shaft and gland are 2/100 of the packing section. If the gaps are larger or the packing in question is inclined to extrude, suitable anti-extrusion rings should be fitted. A copy of our detailed installation instructions is included with each delivery.

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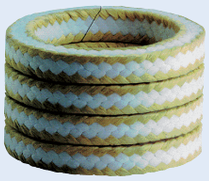
Non-standard Merkel Packings

Merkel packing	Description	Pressure (bar)			Speed (m/s)		Temperature (°C)	pH
		Rotary pumps	Plunger pumps	Valves	Rotary pumps	Plunger pumps		
	Merkel Ramiflex 4510 Ramie fibre with special red grease impregnation	16	100		10	1	-10 ... +120	6 - 9
	Merkel Arolan 6210 Multi-filament aramid yarn with PTFE impregnation and lubricant	25	200		26	2	-50...+280	1 - 13
	Merkel Arochem II 6211 PTFE/Graphite compound yarn re-inforced with aramid corners		500			2	-50...+280	1 - 13
	**Merkel Arochem 6212** PTFE yarn re-inforced with aramid corners	25	500		15	2	-50...+280	1 - 13
	Merkel Aroflex 6226 Staple aramid with mineral grease/graphite impregnation	16			10		-10...+150	2 - 13
	Merkel Flexalon 6250 White synthetic yarn with PTFE impregantion and lubricant	25			25		-50 ... +250	1 - 13
	Merkel Unival II 6326 Graphite-impregnated PTFE yarn with silicon oil lubrication	25			15		-100...+280	0 - 14

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Merkel packing	Description	Pressure (bar)			Speed (m/s)		Temperature (°C)	pH
		Rotary pumps	Plunger pumps	Valves	Rotary pumps	Plunger pumps		
	Merkel Unival GFO® 6329 100 % GFO yarn	25			25		-100...+280	0 - 14
	Merkel Thermapack 6401 High quality silicic acid yarn			10			-50 ... +1100	5 - 9
	Merkel GC Spezial 6567 Expanded flexible graphite fibres and carbon fibres	25		450			-30 ... +400 +550[1]	0 -14
	Merkel Grafolan HT 6570 Graphite yarn with special PTFE impregnation			300			-30...+450 +550[1]	0 - 14
	Merkel G-Spezial AR 6562 Expanded graphite yarns with aramid reinforced corners	40			25		-100...+280	1 - 13
	Merkel Carboflex 6587 Carbon yarn with special PTFE/Graphite impregnation	25			25		-30 ... +300	1 - 13
	Merkel Carbosteam S 6555 Expanded graphite core with carbon yarn overbraid			300			-30 ... +450 +550[1]	0 - 14

1) steam

® GFO, Inconel

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