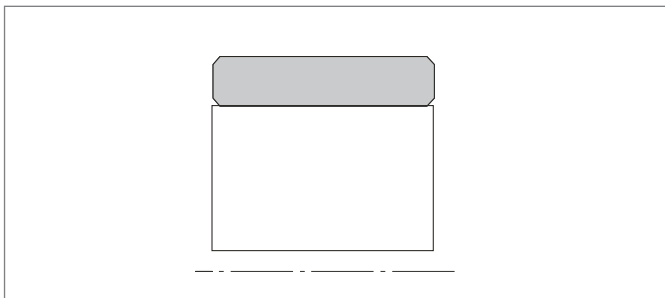


# MERKEL GUIDE RING SB / KB



Merkel guide ring SB (rod) resp. the version KB (piston) are fabric based laminate guide rings with chamfered profile edges.



## VALUE TO THE CUSTOMER

- Metal/fabric based laminate material combination prevents „seizing“
- High load-bearing capacity, elastic (not plastic) behavior up to break point
- Chamfered profile edges prevent edge pressure at the corners of the housing groove

### Applications

Non-metallic guide ring for rods resp. pistons, also for standardised housings as per ISO 10766.

### Material

< 300 mm Ø

Material	Designation	Color
Fabric base laminate	HGW HG517	dark gray

> 300 mm Ø

Material	Designation	Color
Fabric base laminate	HGW HG600	dark gray



## FEATURES AND BENEFITS

### Operating conditions

Material	HGW HG517 HGW HG600
Hydraulic oils, HL, HLP	-40... +120 °C
HFA fluids	+5... +60 °C
HFB fluids	+5... +60 °C
HFC fluids	-40... +60 °C
HFD fluids	-40... +120 °C
Water	+5... +60 °C
HETG (rapeseed oil)	-40... +80 °C
HEES (synthetic ester)	-40... +100 °C
HEPG (glycol)	-40... +80 °C
Mineral greases	-40... +120 °C

Regarding sliding speed, please refer to the sealing system.

### Surface finish

Peak-to-valley heights	$R_a$	$R_{max}$
Sliding surface	0,05 ... 0,3 $\mu\text{m}$	$\leq 2,5 \mu\text{m}$
Groove base	$\leq 1,6 \mu\text{m}$	$\leq 6,3 \mu\text{m}$
Groove sides	$\leq 3,0 \mu\text{m}$	$\leq 15,0 \mu\text{m}$

Material content  $M_r$  > 50% to max. 90%, with cut depth  $c = R_z/2$  and reference line  $C_{ref} = 0\%$

The long term behavior of a sealing element and its reliability to avoid early failure are crucially influenced by the quality of the counterface. Therefore a precise description and assessment of the surface is critical.

Based on recent findings, we recommend supplementing the above definition of surface finish for the sliding surface by the characteristics detailed in the table below. With these new characteristics derived from the material content, previous more general descriptions of the material content are significantly improved, especially in regard to surface roughness (see section with additional information on surfaces in our technical manual).

### Surface finish of the sliding surfaces

Characteristic value	Limit	
$R_a$	>0,05 $\mu\text{m}$	<0,30 $\mu\text{m}$
$R_{max}$	<2,5 $\mu\text{m}$	
$R_{pkx}$	<0,5 $\mu\text{m}$	
$R_{pk}$	<0,5 $\mu\text{m}$	
$R_k$	>0,25 $\mu\text{m}$	<0,7 $\mu\text{m}$
$R_{vk}$	>0,2 $\mu\text{m}$	<0,65 $\mu\text{m}$
$R_{vkx}$	>0,2 $\mu\text{m}$	<2,0 $\mu\text{m}$

The limit values listed in the table do not apply, at the present time, to ceramic or partly ceramic counterfaces.

### Tolerances

Diameter $D_1$ / $d_1$	Profile thickness [mm]
H8 / h8	-0,02 ... -0,08

The tolerance regarding diameters  $d$  and  $D_f$  (SB) resp.  $d_f$  and  $D$  (KB) is determined in connection with the calculation of the gap dimension. Tolerance zones f7 and f8 resp. H7 and H8 (SB) as well as H7 and H8 resp. h7 and h8 (KB) are usually selected for typical hydraulic applications with a nominal size of up to 1.000 mm.

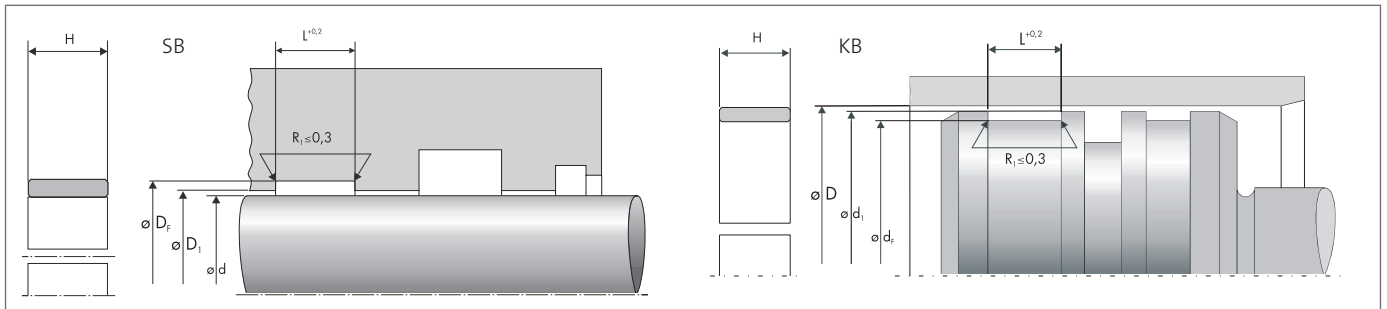
### Design notes

Diameter  $D_1$  (SB) resp.  $d_1$  (KB) indicated in the table of dimensions should be viewed solely in connection with the guide ring. The corresponding diameter of the connected seal housing must be in tune with the sealing element involved. Please note our general remarks on design in our technical manual.



## FEATURES AND BENEFITS

### Installation diagram



### Surface load

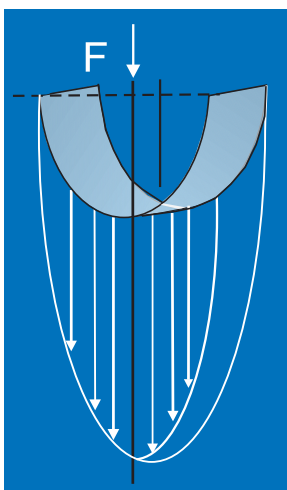
Permissible surface pressure	Operating temperature
$P < 50 \text{ N/mm}^2$	... 60 °C
$P < 25 \text{ N/mm}^2$	... 100 °C

The value for the specific surface pressure depends on the operating temperature and the scope of elastic deformation (spring deflection) of the guiding element involved.

The maximum possible spring deflection in a sealing system is limited by the minimum gap dimension downstream of the primary seal. Further information in our technical manual.

### Side load

The pressure distribution at the contact area between the guide ring and the counterface is not linear. The permissible surface pressure value considers this non-linear contact pressure, as well as a possible angular deviation of the piston respectively the rod. The permissible load of the guide is calculated by multiplying the projected area A with the permissible surface pressure P. For extended service life, it may be advisable to reduce the distributed load by selecting a larger width of the guide ring.

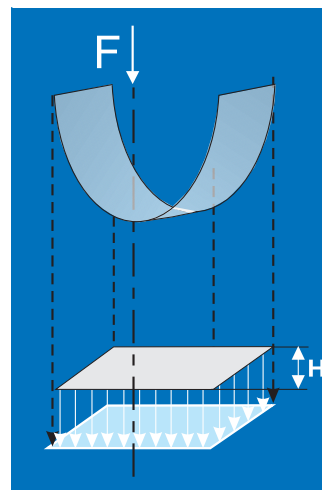


$$F_{\max} = P \times A$$

$$A = d \times H$$

$$H = F / (d \times P)$$

$H$  = Width of guide [mm]  
 $F$  = Radial loads [N]  
 $A$  = Projected area [mm<sup>2</sup>]



$P$  = Permissible surface pressure [N/mm<sup>2</sup>]  
 $d$  = Rod diameter (rod guide); piston diameter (piston guide) [mm]

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