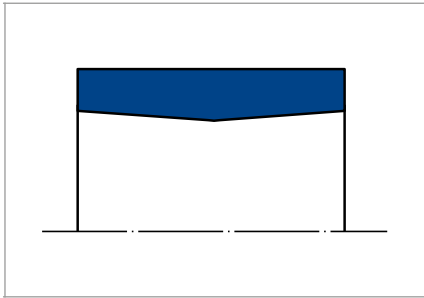# MERKEL GUIDE RING GUIVEX KBK

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 KB and KF
- 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

- Mobile hydraulics
- Long stroke cylinders (piston rod bowing under load)
- Heavy-duty hydraulics

MATERIAL

≤300 mm

Material	Code	Colour
Fabric-base laminate	HGW HG517	Dark grey
Fabric-base laminate	HGW HG650	Red

>300 mm

Material	Code	Colour
Fabric-base laminate	HGW HG650	Red

OPERATING CONDITIONS

Medium/ Temperature	HGW HG517	HGW HG650
Hydraulic oils HL, HLP	−40 °C ... +120 °C	−40 °C ... +120 °C
HFA fluids	+5 °C ... +60 °C	+5 °C ... +60 °C
HFB fluids	+5 °C ... +60 °C	+5 °C ... +60 °C
HFC fluids	−40 °C ... +60 °C	−40 °C ... +60 °C
HFD fluids	−40 °C ... +120 °C	−40 °C ... +120 °C
Water	+5 °C ... +60 °C	+5 °C ... +60 °C
HETG (rapeseed oil)	−40 °C ... +80 °C	−40 °C ... +80 °C
HEES (synthetic ester)	−40 °C ... +100 °C	−40 °C ... +100 °C
HEPG (glycol)	−40 °C ... +80 °C	−40 °C ... +80 °C
Mineral greases	−40 °C ... +120 °C	−40 °C ... +120 °C

DESIGN NOTES

The diameter D1 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.

Surface quality

Peak-to-valley heights	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.

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Sliding surfaces

Abrasivität/MCP-Index	Characteristic value
R_a	>0,05 ... 0,30 mm
R_{max}	<2,50 mm
Core surface roughness R_k	>0,25 ... 0,70 mm
Reduced centre height R_{pk}	<0,50 mm
Full centre height R_{pkx}	<0,50 mm
Reduced groove height R_{vk}	>0,20 ... 0,65 mm
Full groove height R_{vkx}	>0,20 ... 2,00 mm

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

Tolerances

d_1
h9

SPECIALITIES

### Manufacturing tolerance

Production tolerance profile thickness S
−0,01 ... −0,06 mm

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.
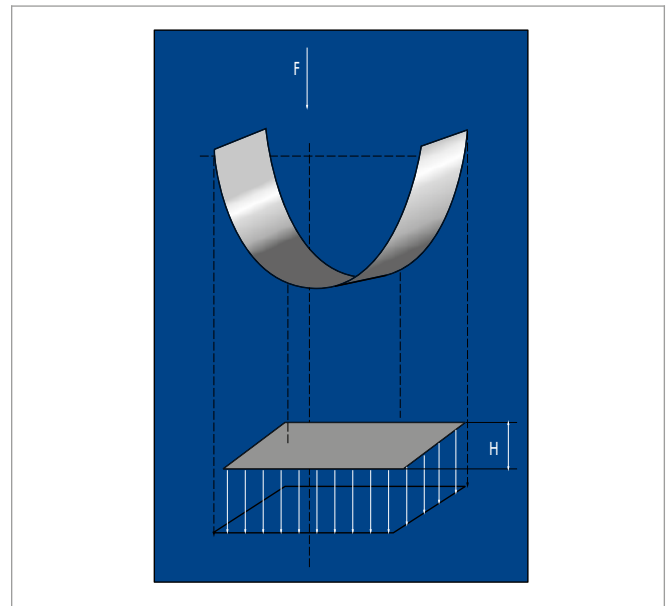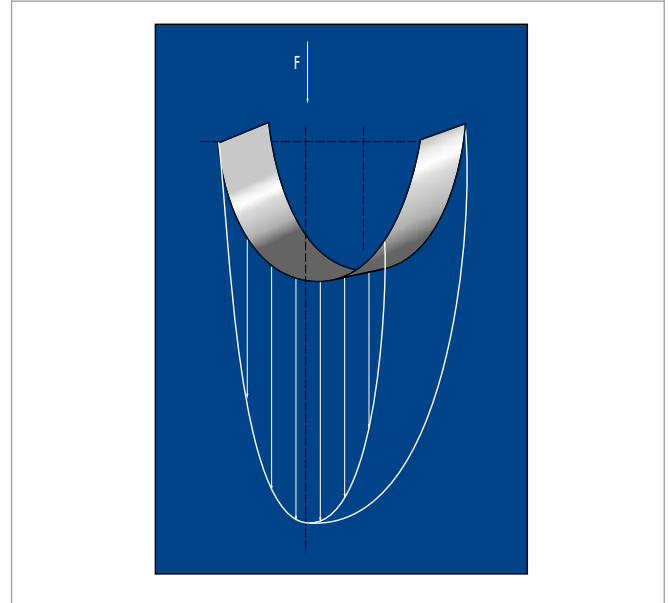
Deflection

s	e1	e2
2,5	0,10	0,15
4,0	0,15	0,15
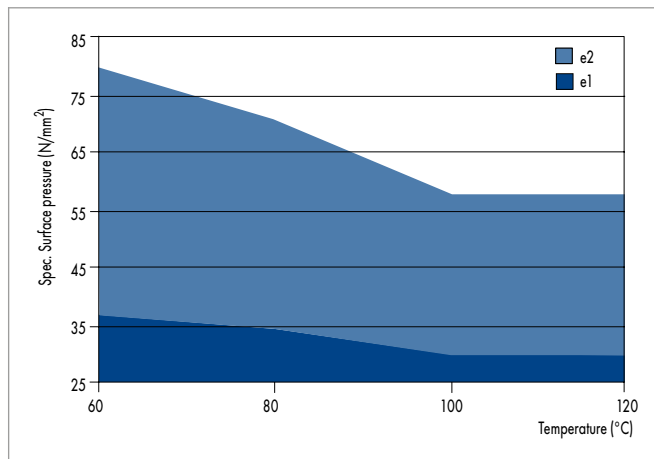
Special surface pressure for parallel load

Radial load

$F = P \times A$

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

H = guide strip width [mm]

F = radial load [N]

A = projected area [mm²]

P = perm. compression per unit area [N/mm²]

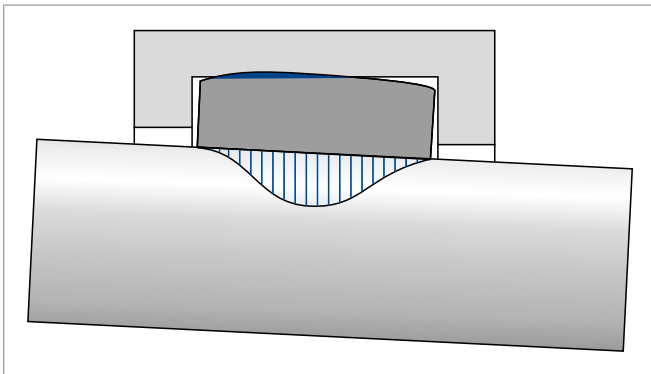d = rod diameter with rod guidance;
    piston diameter with piston guidance [mm].

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 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.

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Mode of operation
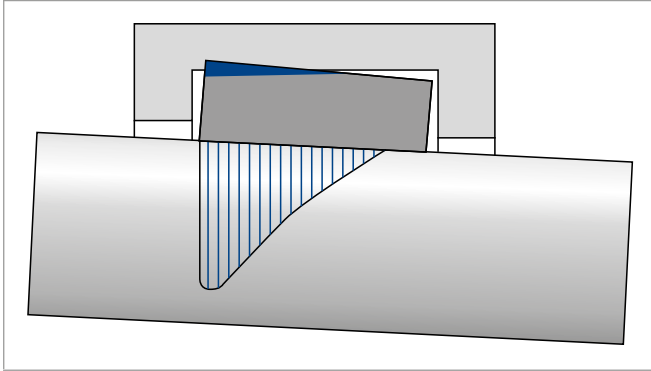
Rectangular guide ring: stress peaks in the edge area

Merkel Guide Ring Guivex KBK: even distribution of stress

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