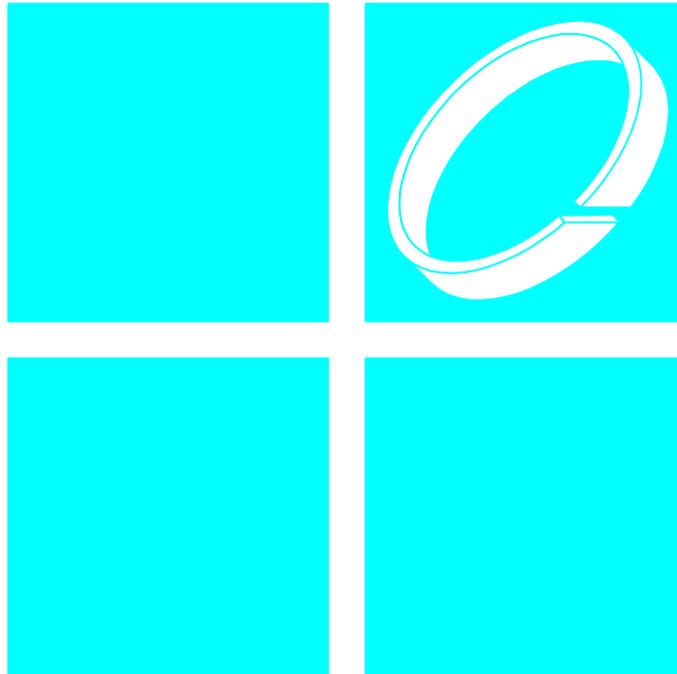


---

# HYDRAULIC SEALS SLYDRING®





---

**Contents**

Choice of Slydring® ..... 4

Design Instructions ..... 7

Turcite® and Zurcon® Slydring® for Piston and Rod ..... 9

HiMod® Slydring® for Piston and Rod ..... 20

Luytex® Slydring® for Piston and Rod ..... 42



## ■ Choice of Slydring®

The function of Slydring® is to guide the piston and piston rod of a hydraulic cylinder and to absorb the transverse forces which occur. At the same time, metallic contact between the sliding parts of the cylinder, e.g. piston and cylinder barrel or rod and cylinder head, must be prevented. Non-metallic guide rings offer major benefits compared with the traditional metallic guides:

- Cost efficient production
- High load bearing capacity
- Eliminates local stress concentrations
- Wear-resistant, long service lives
- Metal/plastic pairing eliminates fretting and seizure
- Favourable friction behaviour
- Damping of mechanical vibrations
- Good wiping effect, embedding of foreign particles possible
- Protection of the seal against "dieseling"
- Free choice of material of the metal components as guiding properties are no longer required
- Eliminates hydrodynamic pressure problems in the guide system
- Simple closed groove, easy installation
- Low service costs

### Materials

In view of the different specific demands made on piston and rod guides, various Slydring® materials are available:

- Highly wear-resistant, low friction, specially modified Turcite® materials for low to medium duty with limited radial forces
- HiMod® materials with friction-reducing fillers for medium duty
- Luytex® fabric composite materials for heavy duty and high radial forces

In order to choose the most suitable Slydring®, it is first necessary to know all the required functional parameters. Table I can be used to make an initial preselection of the Slydring® and the materials to meet the demands of the application.

Before the final choice of Slydring® and material is made, the details and information must be checked in the relevant data sheets of Slydring® materials.

In principle, piston Slydring® and rod Slydring® are interchangeable if the difference in size is taken into consideration, e.g. piston ring, diameter 100 x 2.5 mm thick can be used as a piston rod Slydring® diameter 95 x 2.5 mm thick. Depending on the material and dimensions of the Slydring®, the thickness tolerance is in the range of +0 to -0.08 mm.

Please do not hesitate to contact our Technical Department for further information on specific applications and special technical questions.



**Table I Selection Criteria for Slydring®**

Slydring®		Application				Standard <sup>1)</sup>	Installation	Material	
Type	Page	Field of Application			Mating Surface	ISO	Size Range mm	Recommended Slydring® Material	
		Light	Medium	Heavy					
	9	Mobile hydraulics Standard cylinders Machine tools Injection moulding machines Automotive industry	●	-	-	Steel	ISO 10766	Off-the-roll up to diameter 4200	Turcite® T47
			●	●	-	Steel, hardchromed Cast iron			Turcite® T51
		●	●	-	Mild steel Stainless steel Aluminium, Bronze	Turcite® T59			
		●	●	-	Mild steel Stainless steel Aluminium, Alloys				
		Pneumatics Water hydraulics Dry application	●	-	-	Mild steel Stainless steel Aluminium, Alloys			
		Foodstuff industry Water hydraulics Dry application Pneumatics	●	●	-	Steel Mild steel Steel, hardchromed Stainless steel Aluminium, Bronze Ceramic coating	ISO 10766	Off-the-roll up to diameter 4200	Zurcon® Z80 UHMWPE
	20	Mobile hydraulics Standard cylinders Agricultural machinery	●	●	●	Steel Steel, hardchromed Cast iron	ISO 10766	Rings up to diameter 300	HiMod® HM061 POM/Glass fibre
			●	●	-	Steel Steel, hardchromed Cast iron			HiMod® HM062 PA/Glass fibre + PTFE
		●	●	●	Steel Steel, hardchromed Cast iron	HiMod® HM063 PA/Glass fibre			
	42	Mobile hydraulics Standard cylinders Presses	-	●	●	Steel Steel, hardchromed Cast iron Ceramic coating	ISO 10766	Rings up to diameter 1500 <sup>2)</sup>	Luytex® C320 Polymer/fabric
			●	●	●	Steel Steel, hardchromed Cast iron Stainless steel			Luytex® C380 Polymer/fabric
		●	●	●	Steel Steel, hardchromed Cast iron Stainless steel	Luytex® C931 Phenolic/cotton			

1) For Slydring® to other standards, e.g. to French standard NF E 48-037, please contact us.  
 2) Segments made from off-the-roll material can be used for larger diameters.



**Forms of Supply**

Two characteristics must be observed with respect to the forms of supply for Slydring®:

- Type of cut

Figure 1 shows the angle cut which are the most frequently used standard type of cut. Rings with other types of cut are available on request. Design Code as shown in Table III.

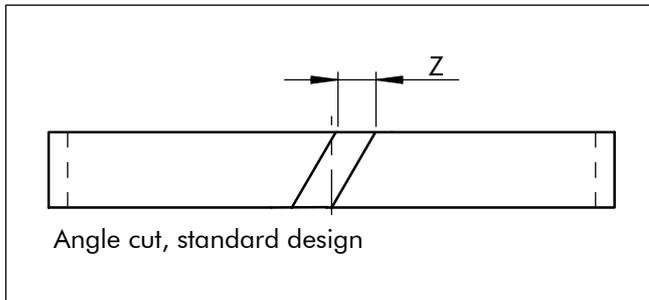


Figure 1 Type of cut

- Design type

Slydring® have a rectangular cross-section with rounded or chamfered edges, thus preventing impermissible edge forces in the corner radii of the grooves. The chamfers also serve to facilitate installation, e.g. when inserting into the cylindrical tube or guide bush.

Slydring® are supplied ready to fit with the gap necessary (dimension Z) for their function. The ring ends are finished as standard with an angle cut.

For further details, please refer to Table II.

Slydring® are depending on material supplied as split rings and/or as strip material.

Strip material is available in rolls or precut to size as listed in Table II.

**Table II Forms of Supply for Slydring®**

Material	Ring Diameter mm	Cut Strip for Diameter mm	Off-the-Roll
Turcite® T47/T51/T59	-	8 - 4200	See Table V
Zurcon® Z80	on request	30 - 4200	on request
Luytex® C320/C380	16 - 1500	300 - 2000	see page 43
Luytex® C931	16 - 1200	-	-
HiMod® HM061	up to 300	-	-
HiMod® HM062	up to 300	-	-
HiMod® HM063	up to 300	-	-

**Table III Design Codes for Cut**

Material	Turcite®		Zurcon®	HiMod®	Luytex®	
	T47 T51 T59		Z80	HM061 HM062 HM063	C320 C380 C931	C320 C380
Code for cut	Strip		Strip	Ring	Ring	Strip
Angle cut	<b>0*</b>	L	<b>0</b>	<b>0</b>	<b>0</b>	A
Straight cut	B*	D	D	-	H	D
Step cut	C*	E	E	-	-	E

Design Code **0**, in bold types are the standard Slydring® versions

\*Design Code for **Turcite®** Slydring® with teardrop structure on both sides - which is standard up to and including 3 mm radial thickness "W". See Ordering Examples.

- Teardrop structure: A detailed description can be found on page 6.



## ■ Design Instructions

### Choice of Slydring®

An initial selection can be made for various application, see Table I.

The values for the load on the Slydring® are valid for a load distribution as illustrated in Figure 2. The flexibility of the materials ensures a relatively constant specific load, irrespective of the size of the radial forces F, as with increasing radial loading, the guide surface subjected to the load increases also.

The radial forces which occur can vary within wide ranges and cannot always be calculated exactly in advance. For such cases, a safety factor of at least 2 is recommended when calculating (see calculation example).

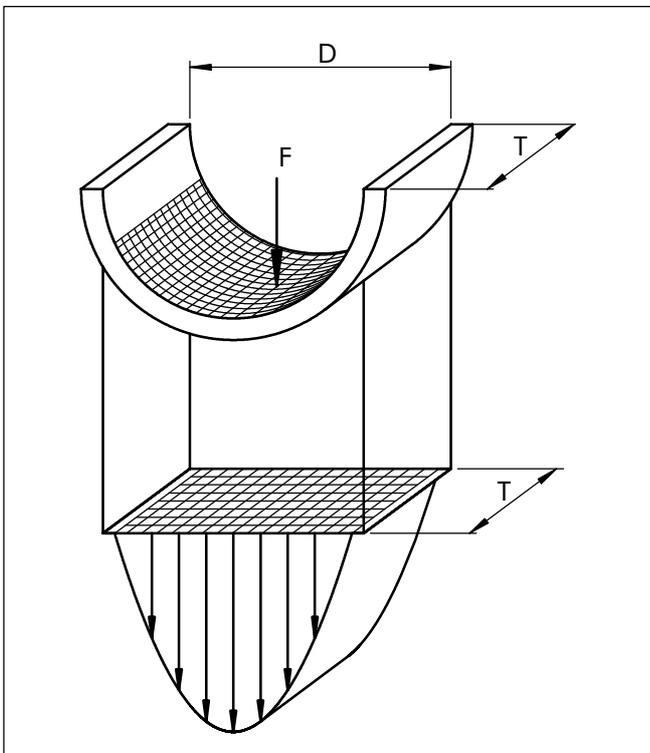


Figure 2 Load distribution

The large effective bearing area of non-metallic Slydring® gives low maximum contact pressure.

### Dimensioning of Slydring®

The load, and thus the resulting elastic deformation, is critical for the design of the Slydring®. The Slydring® clearance resulting from the dimensional tolerance, deformation and wear must always be smaller than the smallest gap to be sealed in the system. On request, we are willing to carry out dimensioning calculations for specific applications.

A rough estimate of the number and width of Slydring® required can be calculated using the following formula:

$$\text{Slydring}^{\circledR} \text{ width } T_{\text{total}} = \frac{F \times f}{d_N \times Pr}$$

where:

- F = Maximum radial load [N]
- f = Safety factor
- d<sub>N</sub> = Rod diameter [mm]
- Pr = Permissible dynamic load [N/mm<sup>2</sup>]

Example:

- d<sub>N</sub> = 60 mm
- F = 40.000 N
- t = 70 °C
- f = 2

Slydring® material Luytex® C 380  
Pr<sub>per.</sub> 100 N/mm<sup>2</sup>

$$\text{Total} = \frac{40.000 \times 2}{60 \times 100} = 13.3 \text{ mm}$$

From Table V, a groove with a width of 15 mm or 2 grooves with widths of 9.7 mm are selected. The installation of two strips is recommended as this gives a wider guide length.

Selected:

2 strips Series GR69 with a groove width L<sub>2</sub> = 9.7 mm

With this choice, the safety factor increases to 2.9.



The standard installation arrangement for pistons and rods is shown in Figures 3 and 4.

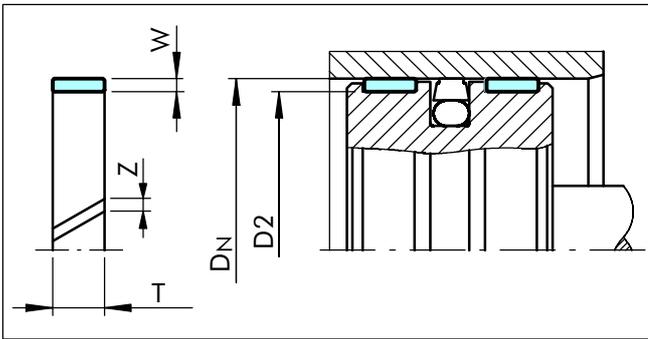


Figure 3 Piston guide

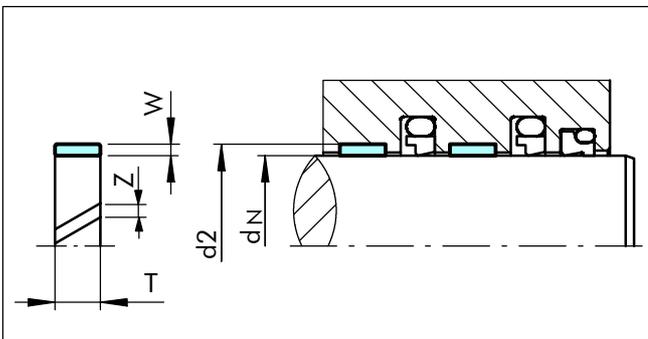


Figure 4 Rod guide

To further improve the operational safety, particularly under high loads, the installation of a 3rd strip made of material Turcite® T47 is recommended. It is installed on the oil side and serves eg as an internal scraper seal where contaminated media may be involved.

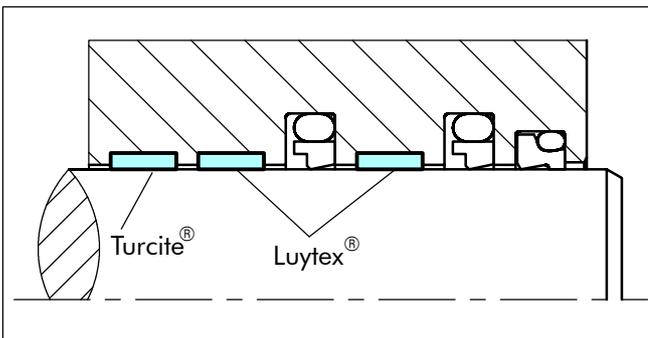


Figure 5 Rod guide for high loads

### Calculation of the Straight Length

The straight length of the Slydring® is calculated such that a gap "Z" is created at the ends of the strip after installation (see Figure 3 and 4). This is required for the following reasons:

- Compensation of the linear expansion of the strips due to the effects of temperature
- Avoidance of intermediate pressures and entrained pressures.

When ordering strips off-the-roll for manufacturing of Slydring® in your own works, the length of the strip can be calculated using the following formulae:

Piston Slydring®:

$$L = c \times (D_N - W) - k \text{ [mm]}$$

Rod Slydring®:

$$L = c \times (d_N + W) - k \text{ [mm]}$$

$D_N$  = Bore diameter [mm]

$d_N$  = Rod diameter [mm]

$W$  = Ring thickness [mm]

$c$  = 3.11 material factor, valid for all materials

$k$  = Temperature constant:  
0.8 for all materials.

1.8 only for Turcite® materials for applications  
> 120° C.

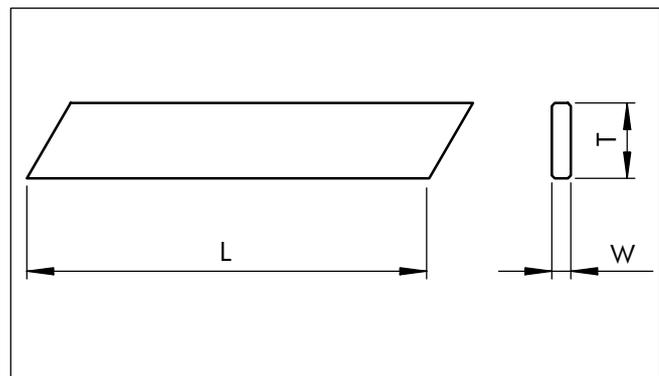


Figure 6 Cut length



## ■ Turcite® Slydring® for Piston and Rod

### Description

Turcite® Slydring® are used as piston and rod guides due to their outstanding friction behaviour, stick-slip free running and good resistance to high temperatures and chemicals.

Slydring® are available as off-the-roll materials for cutting to length in the users works as listed in Table V. Sections cut to size ready for installation is available for rod and piston diameters according to Table II.

Slydring® have a geometrically rectangular cross-section and are chamfered at the edges for easy installation into the grooves.

- Teardrop structure

Slydring® up to and including 3 mm radial thickness in Turcite® materials are as standard supplied with "teardrop" structure on the sliding surfaces. This structure comprises small lubricant pockets on the surface which improve the initial lubrication and promote the formation of a lubricant film. They also help to protect the seal system through their ability to embed any foreign particles. In order to be able to use the strip material for both piston and piston rod guides, the rings have this same teardrop structure on both sides.

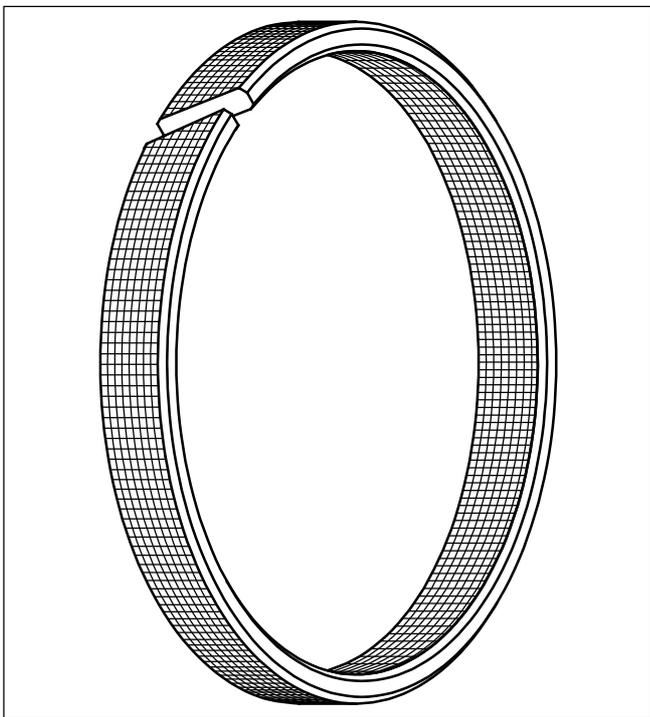


Figure 7 Turcite® Slydring® with teardrop structure

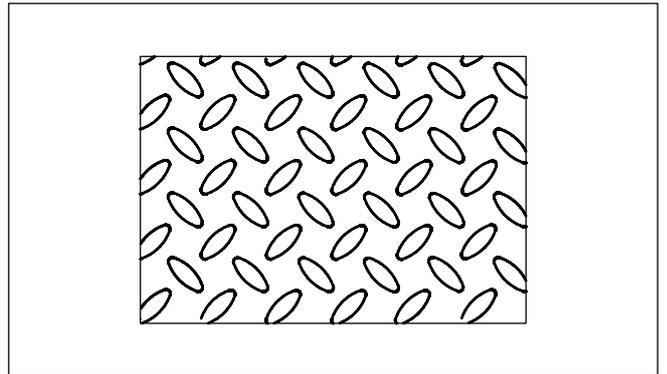


Figure 8 Teardrop structure for Turcite® Slydring®

Slydring® can also be delivered without teardrop structure. In this case, this must be indicated in the Order No. (see Design Code for cut/type in Table III).

### Advantages

- Outstanding lubrication conditions further improved by the Teardrop structure
- No stick-slip effect when starting for smooth operation even at very low speeds
- Minimum static and dynamic friction coefficient for low operating temperature and energy loss
- Suitable for non lubricating fluids depending on Turcite® material for optimum design flexibility
- High wear resistance ensures long service life
- Installation grooves according to ISO 10766
- Suitable for most hydraulic fluids in relation with the majority of modern hardware materials and surface finish depending on material selected.
- Suitable for new environmentally safe hydraulic fluids
- The embedding of foreign particles is enhanced
- Good damping effect, absorbs vibrations



## Application Examples

The Turcite® Slydring® is successfully applied in demanding applications as a standard guiding element for hydraulic operated pistons, plus for piston rods with special requirements, in:

- Machine tools
- Injection moulding machines
- Press brakes
- Presses
- Robotics & Handling machinery
- Automation
- Positioning cylinders
- Servo hydraulics
- Piston accumulators
- Shock absorber
- Valves for hydraulic & pneumatic circuits
- Agriculture
- Chemical and Process Industry

## Technical Data

The Turcite® Slydring® with angle cut is recommended for reciprocating movements

Speed: up to 15m/s

Temperature: -60°C to +150°C (200°C)

Media: Mineral Oil based Hydraulic fluids, barely flammable hydraulic fluids, environmentally safe hydraulic fluids (biological degradable oils), water, air and others. Depending on the Turcite® material compatibility.

Clearance: The maximum permissible radial clearance  $s_{max}$  is depending on the actual sealing system.

Dynamic load F: Max. 15 N/mm<sup>2</sup> at 25°C  
(Values for size and quantity calculation)

With the Turcite® materials it must be taken into account that the permissible surface pressure decreases with increasing temperatures. The load bearing ability for dynamic applications in practice is dependent primarily on the operating temperature. This should therefore generally not exceed 150°C.

### Important Note:

The above data are maximum values and cannot be used at the same time. e.g. the maximum operating speed depends on material type, pressure, temperature and gap value.

## Materials

Various Turcite® materials are recommended for piston and piston rod guides as shown in Table I.

### Standard Application:

- For hydraulic components with reciprocating movement in mineral oils or medium with good lubricating performance. Low friction, high resistance to wear, heat and chemicals:

Turcite® Slydring®: Turcite® T47 (bronze filled)

### Special Application:

- For lubricated and poor lubricated moving components: Water hydraulics and soft metal surfaces:

Turcite® Slydring®: Turcite® T51 (carbon filled)

- For short stroke movements, non-lubricating fluids, water hydraulics, soft metal surfaces or pneumatic, applications requiring self-lubricating sealing materials:

Turcite® Slydring®: Turcon® T59 (carbon fiber filled)

**Table IV Serial Numbers for Turcite® Slydring® in T47, T51, T59**

Piston Serial No.	Rod Serial No.	Off-the-roll Serial No.	Groove Width L <sub>2</sub>	Ring Thickness W
GP41	GR41	GM4100000-	2.50	1.55
GP43	GR43	GM4300000-	4.00	1.55
GP65	GR65	GM6500000-	5.60	2.50
GP69	GR69	GM6900000-	9.70	2.50
GP73	GR73	GM7300000-	15.00	2.50
GP75	GR75	GM7500000-	25.00	2.50
GP98*	GR98*	GM9800000-*	25.00	4.00
GP99*	-	GM9900000-*	9.70	4.00

\* without teardrop structure.

Further dimensions on request.

**Table V Turcite® Slydring® as off-the-roll Material (Rolls)**

Turcite® T47, T51, T59	Ring Thickness
Length of the Roll	W
23.0 m	1.55
13.5 m	2.50
7.0 m	4.00

Off-the-roll material can only be supplied as complete rolls.



## ■ Zurcon® Slydring® for Piston and Rod

### Zurcon® Z80

Z80 is a UHMW-PE (ultra high molecular weight polyethylene) material which meets the requirements in FDA 21 CFR 177.1520 and is therefore recommended for use in foodstuff applications. The material is also preferred for use in water hydraulics and pneumatics due to excellent friction and wear properties.

#### Advantages:

- Good lubrication and wear performance
- Self-lubricating
- Low friction value
- No water absorption
- In compliance with FDA
- Excellent resistance to chemicals
- High wear resistance.

#### Application Examples

- Water hydraulics
- Dry pneumatics
- Filling machines
- Food processing
- Medical equipment
- Ceramic coated hydraulics

#### Technical Data

Velocity, reciprocating: Max. 2.0 m/s  
 Temperature: -60°C to +80°C (100°C)  
 Load F: Max. 25 N/mm<sup>2</sup> at 25°C.  
 (Values for size and quantity calculation)

**Table VI Serial Numbers for Slydring® of Material Zurcon® Z80**

Piston Serial No.	Rod Serial No.	Off-the-roll Order No.	Groove Width	Ring Thickness
			L <sub>2</sub>	W
GP41	GR41	GM4100000-Z80	2.50	1.55
GP43	GR43	GM4300000-Z80	4.00	1.55
GP65	GR65	GM6500000-Z80	5.60	2.50
GP69	GR69	GM6900000-Z80	9.70	2.50
GP73	GR73	GM7300000-Z80	15.00	2.50
GP75	GR75	GM7500000-Z80	25.00	2.50

Further dimensions on request.

The permissible load bearing capacity for dynamic applications is dependent on the operating temperature and must be adapted accordingly.

**Table VII Zurcon® Z80 Slydring® Length of the Roll**

Zurcon® Z80	Ring Thickness
Length of the Roll	W
23.0 m	1.55
13.5 m	2.50

Off-the-roll material can only be supplied as complete rolls.



■ Installation Recommendation, Turcite® and Zurcon® Slydring® for Piston According to ISO 10766 Groove Dimensions

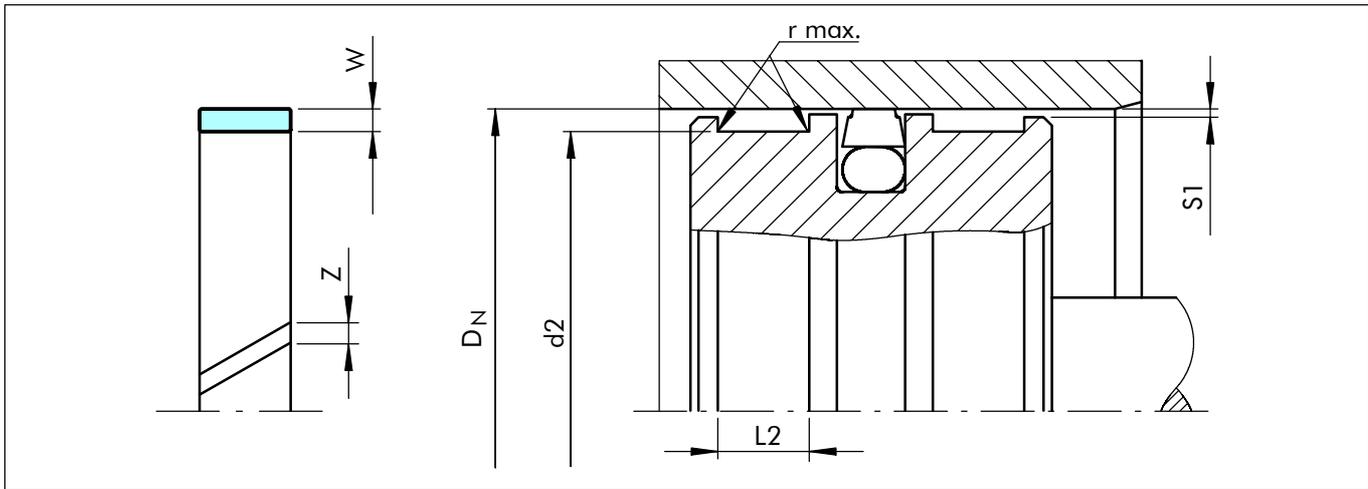


Figure 9 Installation drawing

Table VIII Installation Dimensions

Serial No.	Bore Diameter <sup>1)</sup>	Groove Diameter	Groove Width	Ring Thickness	Ring Gap <sup>3)</sup>
	$D_N$ H9	$d_2$ h8	$L_2 + 0.2$	$W$	$Z$
GP41	8 - 20.0	$D_N - 3.10$	2.50	1.55	1 - 2
GP43	10 - 50.0	$D_N - 3.10$	4.00	1.55	1 - 3
GP65	16 - 140.0	$D_N - 5.00$	5.60	2.50	1 - 6
GP69	60 - 220.0	$D_N - 5.00$	9.70	2.50	3 - 8
GP73	130 - 400.0	$D_N - 5.00$	15.00	2.50	5 - 14
GP75	280 - 999.9	$D_N - 5.00$	25.00	2.50	10 - 33
GP75X	1000-4200.0	$D_N - 5.00$	25.00	2.50	33-134
GP98	280 - 999.9	$D_N - 8.00$	25.00	4.00	10 - 33
GP98X	1000-2200.0	$D_N - 8.00$	25.00	4.00	33 - 70
GP99 <sup>4)</sup>	100 - 999.9	$D_N - 8.00$	9.70	4.00	4 - 33

<sup>1)</sup> Recommended diameter ranges. <sup>3)</sup> Calculation of the straight length, see page ?. <sup>4)</sup> Non ISO 10766 standard.

For Slydring® to other standards, e.g French standard NF E 48-037, please contact us.

Table IX Recommended Radii for Groove Dia.

$D_N$	$r$ max.
8 - 250	0.2
>250	0.4

Table X Radial Clearance S1 <sup>2)</sup>

Bore Dia. $D_N$	S1 min.	S1 max.
8 - 20	0.20	0.30
20 - 100	0.25	0.40
101 - 250	0.30	0.60
251 - 500	0.40	0.80
501 - 1000	0.50	1.10
>1001	0.60	1.20

<sup>2)</sup> Specifications valid only in the area of the Slydring®, but not for the seal area.

Table XI Surface Roughness

Parameter	Mating Surface $\mu\text{m}$		Groove Surface $\mu\text{m}$
	Turcite® Materials	Zurcon® Materials	
$R_{\text{max}}$	0.63 - 4.00	1.00 - 4.00	< 16.0
$R_z$ DIN	0.40 - 2.50	0.63 - 2.50	< 10.0
$R_a$	0.05 - 0.40	0.10 - 0.40	< 2.5



Table XII Slydring® for Piston

Dimensions				Part No.
Bore Diameter	Groove Diameter	Groove-Width	Thick-ness	
D <sub>N</sub> H9	d <sub>2</sub> h8	L <sub>2</sub> +0.2	W	
8.0	4.9	2.5	1.55	GP4100080
10.0	6.9	2.5	1.55	GP4100100
10.0	6.9	4.0	1.55	GP4300100
12.0	8.9	4.0	1.55	GP4300120
14.0	10.9	4.0	1.55	GP4300140
15.0	11.9	4.0	1.55	GP4300150
<b>16.0</b>	<b>12.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300160</b>
<b>16.0</b>	<b>11.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500160</b>
18.0	14.9	4.0	1.55	GP4300180
18.0	13.0	5.6	2.50	GP6500180
<b>20.0</b>	<b>16.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300200</b>
<b>20.0</b>	<b>15.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500200</b>
22.0	17.0	5.6	2.50	GP6500220
<b>25.0</b>	<b>21.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300250</b>
<b>25.0</b>	<b>20.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500250</b>
25.0	20.0	9.7	2.50	GP6900250
27.0	22.0	5.6	2.50	GP6500270
27.0	22.0	9.7	2.50	GP6900270
28.0	23.0	5.6	2.50	GP6500280
30.0	26.9	4.0	1.55	GP4300300
30.0	25.0	5.6	2.50	GP6500300
30.0	25.0	9.7	2.50	GP6900300
<b>32.0</b>	<b>28.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300320</b>
<b>32.0</b>	<b>27.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500320</b>
32.0	27.0	9.7	2.50	GP6900320
33.0	28.0	5.6	2.50	GP6500330
35.0	30.0	5.6	2.50	GP6500350
35.0	30.0	9.7	2.50	GP6900350
36.0	31.9	4.0	1.55	GP4300360
37.0	32.0	5.6	2.50	GP6500370
37.0	32.0	9.7	2.50	GP6900370
<b>40.0</b>	<b>36.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300400</b>
<b>40.0</b>	<b>35.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500400</b>
40.0	35.0	9.7	2.50	GP6900400
41.0	36.0	5.6	2.50	GP6500410
41.0	36.0	9.7	2.50	GP6900410
42.0	37.0	5.6	2.50	GP6500420
45.0	40.0	5.6	2.50	GP6500450
45.0	40.0	9.7	2.50	GP6900450

Dimensions				Part No.
Bore Diameter	Groove Diameter	Groove-Width	Thick-ness	
D <sub>N</sub> H9	d <sub>2</sub> h8	L <sub>2</sub> +0.2	W	
48.0	43.0	5.6	2.50	GP6500480
<b>50.0</b>	<b>46.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300500</b>
<b>50.0</b>	<b>45.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500500</b>
50.0	45.0	9.7	2.50	GP6900500
52.0	47.0	5.6	2.50	GP6500520
55.0	50.0	5.6	2.50	GP6500550
55.0	50.0	9.7	2.50	GP6900550
60.0	55.0	5.6	2.50	GP6500600
60.0	55.0	9.7	2.50	GP6900600
61.0	56.0	5.6	2.50	GP6500610
61.0	56.0	9.7	2.50	GP6900610
<b>63.0</b>	<b>58.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500630</b>
<b>63.0</b>	<b>58.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6900630</b>
65.0	60.0	5.6	2.50	GP6500650
65.0	60.0	9.7	2.50	GP6900650
68.0	63.0	5.6	2.50	GP6500680
68.0	63.0	9.7	2.50	GP6900680
70.0	65.0	5.6	2.50	GP6500700
70.0	65.0	9.7	2.50	GP6900700
72.0	67.0	5.6	2.50	GP6500720
75.0	70.0	5.6	2.50	GP6500750
75.0	70.0	9.7	2.50	GP6900750
<b>80.0</b>	<b>75.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500800</b>
<b>80.0</b>	<b>75.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6900800</b>
85.0	80.0	5.6	2.50	GP6500850
85.0	80.0	9.7	2.50	GP6900850
90.0	85.0	5.6	2.50	GP6500900
90.0	85.0	9.7	2.50	GP6900900
95.0	90.0	5.6	2.50	GP6500950
95.0	90.0	9.7	2.50	GP6900950
<b>100.0</b>	<b>95.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6501000</b>
<b>100.0</b>	<b>95.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901000</b>
105.0	100.0	5.6	2.50	GP6501050
105.0	100.0	9.7	2.50	GP6901050
110.0	105.0	9.7	2.50	GP6901100
115.0	110.0	9.7	2.50	GP6901150
120.0	115.0	9.7	2.50	GP6901200
<b>125.0</b>	<b>120.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6501250</b>
<b>125.0</b>	<b>120.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901250</b>



Dimensions				Part No.
Bore Diameter	Groove Diameter	Groove-Width	Thick-ness	
$D_N$ H9	$d_2$ h8	$L_2 +0.2$	W	
130.0	125.0	9.7	2.50	GP6901300
130.0	125.0	15.0	2.50	GP7301300
135.0	130.0	9.7	2.50	GP6901350
135.0	130.0	15.0	2.50	GP7301350
<b>140.0</b>	<b>135.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901400</b>
<b>140.0</b>	<b>135.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7301400</b>
150.0	145.0	15.0	2.50	GP7301500
<b>160.0</b>	<b>155.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901600</b>
<b>160.0</b>	<b>155.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7301600</b>
170.0	165.0	15.0	2.50	GP7301700
<b>180.0</b>	<b>175.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901800</b>
<b>180.0</b>	<b>175.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7301800</b>
190.0	185.0	15.0	2.50	GP7301900
<b>200.0</b>	<b>195.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6902000</b>
<b>200.0</b>	<b>195.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7302000</b>
210.0	205.0	15.0	2.50	GP7302100
<b>220.0</b>	<b>215.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6902200</b>
<b>220.0</b>	<b>215.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7302200</b>
230.0	225.0	15.0	2.50	GP7302300
240.0	235.0	15.0	2.50	GP7302400
<b>250.0</b>	<b>245.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6902500</b>
<b>250.0</b>	<b>245.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7302500</b>
<b>280.0</b>	<b>275.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7302800</b>
<b>280.0</b>	<b>275.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GP7502800</b>

Dimensions				Part No.
Bore Diameter	Groove Diameter	Groove-Width	Thick-ness	
$D_N$ H9	$d_2$ h8	$L_2 +0.2$	W	
<b>280.0</b>	<b>272.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9802800</b>
300.0	295.0	15.0	2.50	GP7303000
<b>320.0</b>	<b>315.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7303200</b>
<b>320.0</b>	<b>315.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GP7503200</b>
<b>320.0</b>	<b>312.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9803200</b>
350.0	345.0	25.0	2.50	GP7503500
<b>360.0</b>	<b>355.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7303600</b>
<b>360.0</b>	<b>355.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GP7503600</b>
<b>360.0</b>	<b>352.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9803600</b>
<b>400.0</b>	<b>395.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7304000</b>
<b>400.0</b>	<b>395.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GP7504000</b>
<b>400.0</b>	<b>392.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9804000</b>
<b>450.0</b>	<b>445.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7304500</b>
<b>450.0</b>	<b>445.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GP7504500</b>
<b>450.0</b>	<b>442.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9804500</b>
<b>500.0</b>	<b>495.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7305000</b>
<b>500.0</b>	<b>495.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GP7505000</b>
<b>500.0</b>	<b>492.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9805000</b>
1000.0	995.0	25.0	2.50	GP75X1000
2700.0	2695.0	25.0	2.50	GP75X2700
4200.0	4195.0	25.0	2.50	GP75X4200

Zurcon® Z80 is not available as GP98, GP98X and GP99 (Thickness W=4.0 mm)

All sizes printed in bold type conform to ISO 10766 and should be preferred for use.

All intermediate sizes not contained in the table are available.

The Order No. can be formed from the example below.

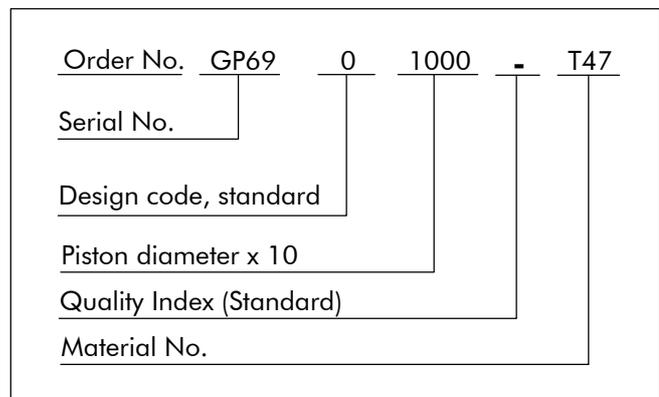
**Ordering Example**

Slydring® for piston diameter  $D_N = 100.0$  mm  
 Series GP 69 from Table VIII  
 Groove width: 9.70 mm, ring thickness: 2.50 mm

Material: Turcite® T47  
 (other materials see Tabel I)

Standard design: With angle cut and teardrop structure  
 Design code: 0

Order No.: GP6901000 (from Table XII)

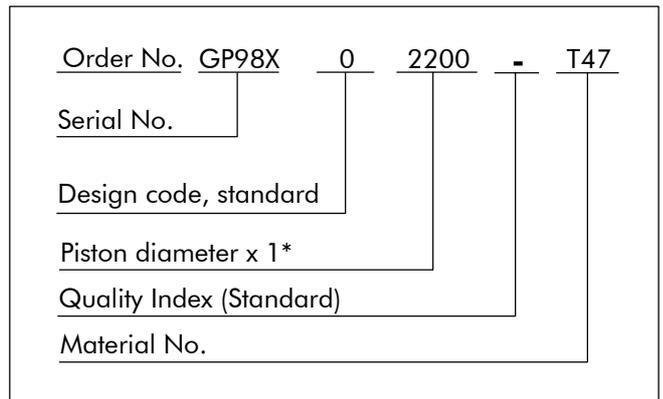




**Ordering Example for  $D_N \geq 1000$  mm**

Slydring® for piston diameter  $D_N = 2200.0$  mm  
 Series GP98X from Table VIII  
 Groove width: 25.00 mm, ring thickness: 4.00 mm

Order No.: GP98X2200 (from Table XII)



\* For diameters  $\geq 1000.0$  mm multiply only by factor 1.



■ Installation Recommendation, Turcite® and Zurcon® Slydring® for Rod According to ISO 10766 Groove Dimension

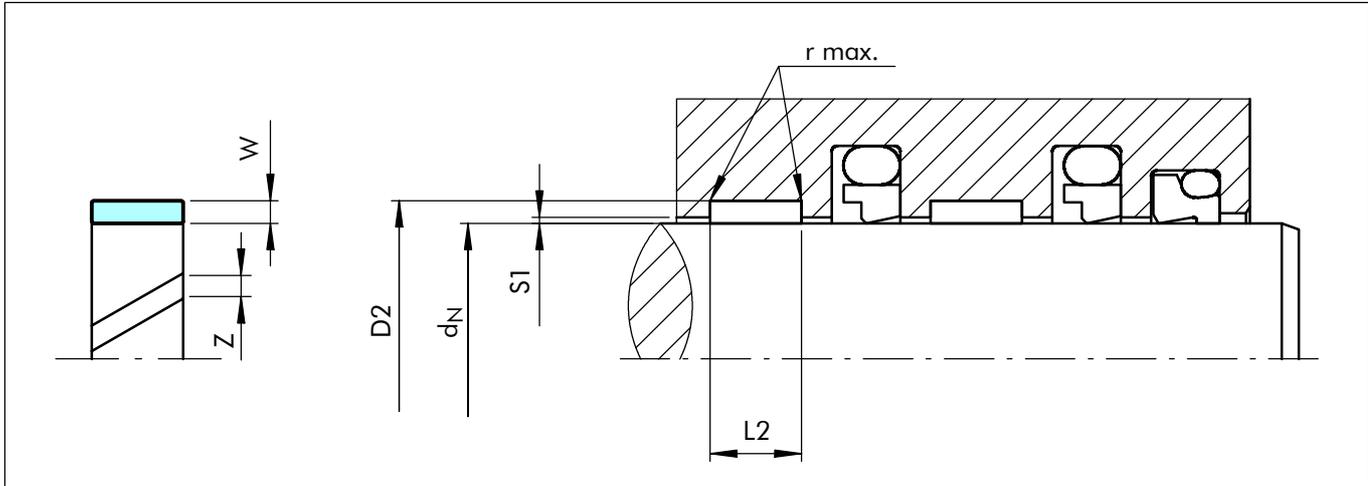


Figure 10 Installation drawing

Table XIII Installation Dimensions

Serial No.	Rod Diameter <sup>1)</sup>	Groove Diameter	Groove Width	Ring Thickness	Ring Gap <sup>3)</sup>
	$d_N$ f8/h9	$D_2$ H8	$L_2 + 0.2$	$W$	$Z$
GR41	8 - 20.0	$d_N + 3.10$	2.50	1.55	1 - 2
GR43	10 - 50.0	$d_N + 3.10$	4.00	1.55	1 - 3
GR65	15 - 140.0	$d_N + 5.00$	5.60	2.50	2 - 5
GR69	20 - 220.0	$d_N + 5.00$	9.70	2.50	2 - 9
GR73	80 - 400.0	$d_N + 5.00$	15.00	2.50	4 - 15
GR75	200 - 999.9	$d_N + 5.00$	25.00	2.50	8 - 33
GR75X	1000-4200.0	$d_N + 5.00$	25.00	2.50	33-134
GR98	280 - 999.9	$d_N + 8.00$	25.00	4.00	10 - 33
GR98X	1000-2200.0	$d_N + 8.00$	25.00	4.00	33 - 70

<sup>1)</sup> Recommended diameter ranges. <sup>3)</sup> Calculation of the straight length, see page 8.

For Slydring® to other standards, e.g French standard NF E 48-037, please contact us.

Table XIV Recommended Radii for Groove Dia.

$d_N$	$r$ max.
8 - 250	0.2
>250	0.4

Table XV Radial Clearance S1 <sup>2)</sup>

Rod Dia. $d_N$	S1 min.	S1 max.
8 - 20	0.20	0.30
20 - 100	0.25	0.40
101 - 250	0.30	0.60
251 - 500	0.40	0.80
501 - 1000	0.50	1.10
>1001	0.60	1.20

<sup>2)</sup> Specifications valid only in the area of the Slydring®, but not for the seal area.

Table XVI Surface Roughness

Parameter	Mating Surface $\mu\text{m}$		Groove Surface $\mu\text{m}$
	Turcite® Materials	Zurcon® Materials	
$R_{max}$	0.63 - 4.00	1.00 - 4.00	< 16.0
$R_{z \text{ DIN}}$	0.40 - 2.50	0.63 - 2.50	< 10.0
$R_a$	0.05 - 0.40	0.10 - 0.40	< 2.5



Table XVII Slydring® for Rods

Dimensions				Part No.
Rod Diameter	Groove Diameter	Groove Width	Thick-ness	
$d_N$ f8/h9	$D_2$ H8	$L_2$ +0.2	W	
8.0	11.1	2.5	1.55	GR4100080
10.0	13.1	2.5	1.55	GR4100100
10.0	13.1	4.0	1.55	GR4300100
<b>12.0</b>	<b>15.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300120</b>
<b>14.0</b>	<b>17.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300140</b>
15.0	18.1	4.0	1.55	GR4300150
<b>16.0</b>	<b>19.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300160</b>
16.0	21.0	5.6	2.50	GR6500160
<b>18.0</b>	<b>21.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300180</b>
18.0	23.0	5.6	2.50	GR6500180
<b>20.0</b>	<b>23.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300200</b>
20.0	25.0	5.6	2.50	GR6500200
20.0	25.0	9.7	2.50	GR6900200
<b>22.0</b>	<b>25.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300220</b>
22.0	27.0	5.6	2.50	GR6500220
22.0	27.0	9.7	2.50	GR6900220
<b>25.0</b>	<b>28.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300250</b>
<b>25.0</b>	<b>30.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500250</b>
25.0	30.0	9.7	2.50	GR6900250
27.0	32.0	5.6	2.50	GR6500270
27.0	32.0	9.7	2.50	GR6900270
<b>28.0</b>	<b>31.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300280</b>
<b>28.0</b>	<b>33.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500280</b>
28.0	33.0	9.7	2.50	GR6900280
30.0	35.0	5.6	2.50	GR6500300
30.0	35.0	9.7	2.50	GR6900300
<b>32.0</b>	<b>37.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500320</b>
<b>32.0</b>	<b>37.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900320</b>
35.0	40.0	5.6	2.50	GR6500350
35.0	40.0	9.7	2.50	GR6900350
<b>36.0</b>	<b>41.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500360</b>
<b>36.0</b>	<b>41.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900360</b>
<b>40.0</b>	<b>45.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500400</b>
<b>40.0</b>	<b>45.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900400</b>
40.0	45.0	15.0	2.50	GR7300400
42.0	47.0	5.6	2.50	GR6500420
43.0	48.0	5.6	2.50	GR6500430
<b>45.0</b>	<b>50.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500450</b>
<b>45.0</b>	<b>50.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900450</b>

Dimensions				Part No.
Rod Diameter	Groove Diameter	Groove Width	Thick-ness	
$d_N$ f8/h9	$D_2$ H8	$L_2$ +0.2	W	
48.0	53.0	5.6	2.50	GR6500480
48.0	53.0	9.7	2.50	GR6900480
<b>50.0</b>	<b>55.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500500</b>
<b>50.0</b>	<b>55.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900500</b>
52.0	57.0	5.6	2.50	GR6500520
52.0	57.0	9.7	2.50	GR6900520
55.0	60.0	5.6	2.50	GR6500550
55.0	60.0	9.7	2.50	GR6900550
<b>56.0</b>	<b>61.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500560</b>
<b>56.0</b>	<b>61.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900560</b>
58.0	63.0	5.6	2.50	GR6500580
58.0	63.0	9.7	2.50	GR6900580
60.0	65.0	5.6	2.50	GR6500600
60.0	65.0	9.7	2.50	GR6900600
<b>63.0</b>	<b>68.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500630</b>
<b>63.0</b>	<b>68.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900630</b>
63.0	68.0	15.0	2.50	GR7300630
65.0	70.0	5.6	2.50	GR6500650
65.0	70.0	9.7	2.50	GR6900650
<b>70.0</b>	<b>75.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500700</b>
<b>70.0</b>	<b>75.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900700</b>
70.0	75.0	15.0	2.50	GR7300700
75.0	80.0	5.6	2.50	GR6500750
75.0	80.0	9.7	2.50	GR6900750
75.0	80.0	15.0	2.50	GR7300750
80.0	85.0	5.6	2.50	GR6500800
<b>80.0</b>	<b>85.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900800</b>
85.0	90.0	5.6	2.50	GR6500850
85.0	90.0	9.7	2.50	GR6900850
90.0	95.0	5.6	2.50	GR6500900
<b>90.0</b>	<b>95.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900900</b>
<b>90.0</b>	<b>95.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7300900</b>
95.0	100.0	5.6	2.50	GR6500950
95.0	100.0	9.7	2.50	GR6900950
95.0	100.0	15.0	2.50	GR7300950
100.0	105.0	5.6	2.50	GR6501000
<b>100.0</b>	<b>105.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901000</b>
<b>100.0</b>	<b>105.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301000</b>



Dimensions				Part No.
Rod Diameter	Groove Diameter	Groove Width	Thick-ness	
$d_N$ f8/h9	$D_2$ H8	$L_2$ +0.2	W	
105.0	110.0	9.7	2.50	GR6901050
105.0	110.0	15.0	2.50	GR7301050
<b>110.0</b>	<b>115.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901100</b>
<b>110.0</b>	<b>115.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301100</b>
115.0	120.0	9.7	2.50	GR6901150
115.0	120.0	15.0	2.50	GR7301150
120.0	125.0	5.6	2.50	GR6501200
120.0	125.0	9.7	2.50	GR6901200
120.0	125.0	15.0	2.50	GR7301200
<b>125.0</b>	<b>130.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901250</b>
<b>125.0</b>	<b>130.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301250</b>
130.0	135.0	15.0	2.50	GR7301300
135.0	140.0	15.0	2.50	GR7301350
<b>140.0</b>	<b>145.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901400</b>
<b>140.0</b>	<b>145.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301400</b>
150.0	155.0	15.0	2.50	GR7301500
155.0	160.0	15.0	2.50	GR7301550
<b>160.0</b>	<b>165.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901600</b>
<b>160.0</b>	<b>165.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301600</b>
170.0	175.0	15.0	2.50	GR7301700
<b>180.0</b>	<b>185.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901800</b>
<b>180.0</b>	<b>185.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301800</b>
190.0	195.0	15.0	2.50	GR7301900
195.0	200.0	15.0	2.50	GR7301950
<b>200.0</b>	<b>205.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7302000</b>
<b>200.0</b>	<b>205.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7502000</b>
210.0	215.0	15.0	2.50	GR7302100
<b>220.0</b>	<b>225.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7302200</b>
<b>220.0</b>	<b>225.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7502200</b>
230.0	235.0	25.0	2.50	GR7502300
240.0	245.0	25.0	2.50	GR7502400
<b>250.0</b>	<b>255.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7302500</b>
<b>250.0</b>	<b>255.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7502500</b>
<b>280.0</b>	<b>285.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7302800</b>
<b>280.0</b>	<b>285.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7502800</b>
<b>280.0</b>	<b>288.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GR9802800</b>
300.0	305.0	25.0	2.50	GR7503000
<b>320.0</b>	<b>325.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7303200</b>
<b>320.0</b>	<b>325.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7503200</b>

Dimensions				Part No.
Rod Diameter	Groove Diameter	Groove Width	Thick-ness	
$d_N$ f8/h9	$D_2$ H8	$L_2$ +0.2	W	
<b>320.0</b>	<b>328.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GR9803200</b>
350.0	355.0	25.0	2.50	GR7503500
<b>360.0</b>	<b>365.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7303600</b>
<b>360.0</b>	<b>365.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7503600</b>
<b>360.0</b>	<b>368.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GR9803600</b>
400.0	405.0	25.0	2.50	GR7504000
400.0	408.0	25.0	4.00	GR9804000
800.0	805.0	25.0	2.50	GR7508000
800.0	808.0	25.0	4.00	GR9808000
1000.0	1005.0	25.0	2.50	GR75X1000
1000.0	1008.0	25.0	4.00	GR98X1000
2600.0	2605.0	25.0	2.50	GR75X2600
4200.0	4205.0	25.0	2.50	GR75X4200

Zurcon® Z80 is not available as GR98 and GR98X (Thickness W=4.0 mm)

All sizes printed in bold type conform to ISO 10766 and should be preferred for use.

All intermediate sizes not contained in the table are available upon request.

The Order No. can be formed from the example below.

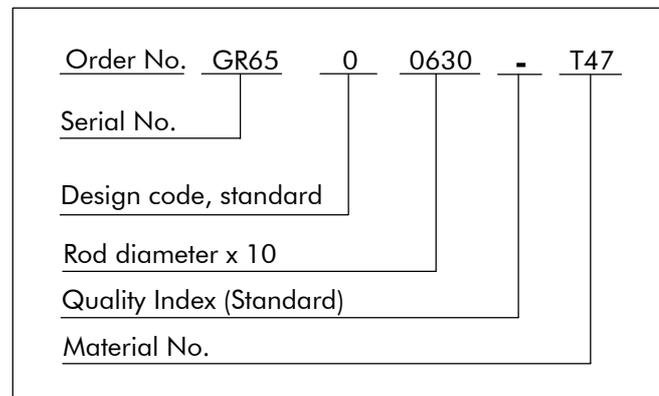
### Ordering Example

Slydring® for rod diameter  $d_N = 63.0$  mm  
 Series GR 65 from Table XIII  
 Groove width: 5.60 mm, ring thickness: 2.50 mm

Material: Turcite® T47  
 (other materials see Table I)

Standard design: With angle cut and teardrop structure  
 Design code: 0

Order No.: GR6500630 (from Table XVII)

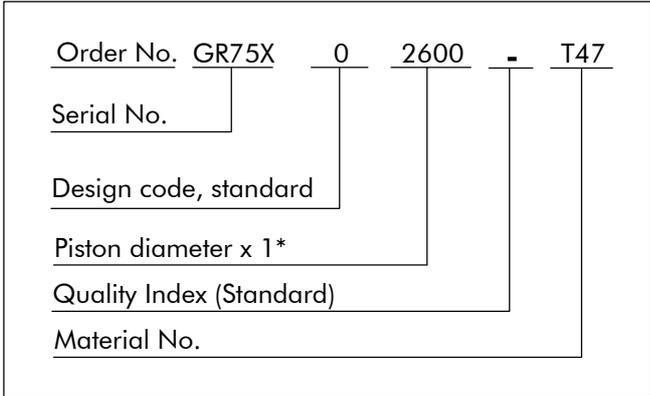




**Ordering Example for  $d_N \geq 1000$  mm**

Slydring® for rod diameter  $d_N = 2600.0$  mm  
 Series GR75X from Table XIII  
 Groove width: 25.00 mm, ring thickness: 2.50 mm

Order No.: GR75X2600 (from Table XVII)



\* For diameters  $\geq 1000.0$  mm multiply only by factor 1.



## ■ HiMod® Slydring® for Piston and Rod

### Description

HiMod® Slydring® are made in special, modified thermo-plastic material and can be used in hydraulic cylinders for medium to high loads. Three different grades of material are available:

HiMod® HM061, PO-POG2	A special glass fibre reinforced polyacetal
HiMod® HM062	A special glass fibre reinforced heat-stabilised polyamid with PTFE filler
HiMod® HM063	A special glass fibre reinforced heat-stabilised polyamid

Slydring® in material HM061 (PO-POG2), HM062 and HM063 are injection moulded to finish parts (mould necessary), a wide range of standard sizes (see Tables XXIII and XXIV) are available. Additionally, further non-standard sizes are available on request.

### Application Examples

HiMod® Slydring® (HM061, 062, 063) is generally utilised in a wide range of hydraulic equipment such as:

- Standard hydraulic cylinder, medium range
- Truck tail lift
- Telescopic cylinders
- Truck cranes
- Forklift truck
- Stabiliser cylinders
- Agriculture equipment

### Materials

#### HiMod® HM061-POG2-PO

All 3 materials are polyacetal (POM) based material with glass fibres.

Former compound designations	
Busak+Shamban:	Zurcon Z61 (HM061)
Polypac:	POM/GL/BK (PO)
Sealing Parts:	Wearite (POG2)

### Advantages:

- Favourable price/performance ratio
- High compressive strength
- Easy installation on pistons and glands (gland bore > 40 mm)
- High wear resistance
- Water absorption 0.2 %
- High stiffness.

### Technical Data

Velocity, reciprocating:	Max. 0.8 m/s
Temperature:	-40°C to +110°C
Load:	Max. 40 N/mm <sup>2</sup> at 25°C. (Values for size and quantity calculation including safety factor).



**HiMod® HM062**

HM062 is a polyamid (PA 66) based material with glass fibres and PTFE filler. The material is heat stabilised.

Former material designation  
(Polypac material code: PA 299A 207AFT 15).

**Advantages:**

- Good price/performance ratio
- High compressive strength even at high temperatures
- High wear resistance
- Easy installation on pistons and glands (gland bore > 30 mm)
- Low friction
- For operation under poor lubrication.

**Technical Data**

Velocity, reciprocating: Max. 1.0 m/s  
 Temperature: -40°C to +130°C  
 Load: Max. 75 N/mm<sup>2</sup> at 60°C  
 (Values for size and quantity calculation including safety factor).

**HiMod® HM063**

HM063 is a polyamid (PA 66) based material with glass fibres. The material is heat stabilised.

Former material designation  
(Polypac: PA 299A-207AB)

**Advantages:**

- Good price/performance ratio
- High compressive strength even at high temperatures
- High wear resistance
- Easy installation on pistons and glands (gland bore > 30 mm)
- Low friction

**Technical Data**

Velocity, reciprocating: Max. 1.0 m/s  
 Temperature: -40°C to +130°C  
 Load: Max. 75 N/mm<sup>2</sup> at 60°C  
 (Values for size and quantity calculation including safety factor).

**Table XVIII Serial Numbers for HiMod® Injection Moulded Slydring®**

Piston Serial No. In Material HiMod® HM061 HM062 HM063	Rod Serial No. In Material HiMod® HM061 HM062 HM063	Groove Width  L <sub>2</sub>	Ring Thickness  W
GP49	GR49	9.70	2.00
GP51	GR51	10.20	2.00
GP53	GR53	15.20	2.00
GP54	GR54	20.30	2.00
GP65	GR65	5.60	2.50
GP69	GR69	9.70	2.50
GP73	GR73	15.00	2.50
GPN1	GRN1	9.70	3.00
GPN3	GRN3	12.80	3.00
GPN4	GRN4	19.20	3.00

All Slydring® have chamfered edges, thus preventing impermissible edge forces in the corner radii of the grooves.



■ Installation Recommendation, HiMod® Slydring® for Piston According to ISO 10766 Groove Dimension

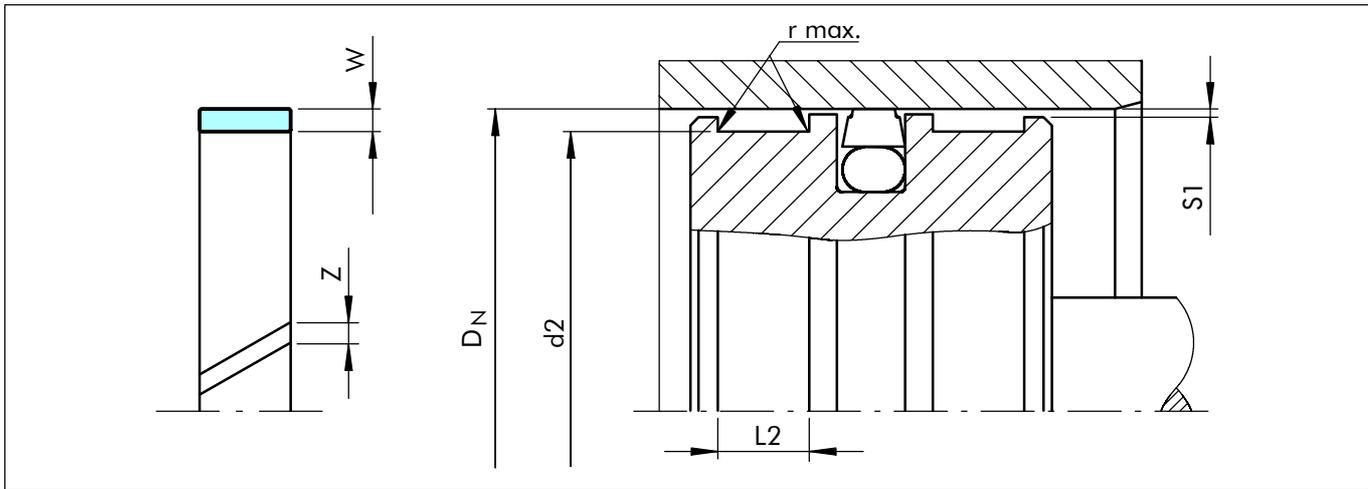


Figure 11 Installation drawing

Table XIX Installation Dimensions

Serial No.	Bore Diameter <sup>1)</sup>	Groove Diameter	Groove Width	Ring Thickness	Ring Gap <sup>3)</sup>
	$D_N$ H9	$d_2$ h8	$L_2 + 0.2$	$W$	$Z$
GP41	8 - 20.0	$D_N - 3.10$	2.50	1.55	1 - 2
GP43	10 - 50.0	$D_N - 3.10$	4.00	1.55	1 - 3
GP65	16 - 140.0	$D_N - 5.00$	5.60	2.50	1 - 6
GP69	60 - 220.0	$D_N - 5.00$	9.70	2.50	3 - 8
GP73	130 - 300.0	$D_N - 5.00$	15.00	2.50	5 - 14
GP75	280 - 300.0	$D_N - 5.00$	25.00	2.50	10 - 33

<sup>1)</sup> Recommended diameter ranges. <sup>3)</sup> Calculation of the straight length, see page ?. <sup>4)</sup> Non ISO 10766 standard.

For Slydring® to other standards, e.g French standard NF E 48-037, please contact us.

Table XX Recommended Radii for Groove Dia.

$D_N$	$r$ max.
8 - 250	0.2
>250	0.4

Table XXI Radial Clearance S1 <sup>2)</sup>

Bore Dia. $D_N$	S1 min.	S1 max.
8 - 20	0.20	0.30
20 - 100	0.25	0.40
101 - 250	0.30	0.60
251 - 300	0.40	0.80

<sup>2)</sup> Specifications valid only in the area of the Slydring®, but not for the seal area.

Table XXII Surface Roughness

Parameter	Mating Surface $\mu\text{m}$	Groove Surface $\mu\text{m}$
	HiMod® Materials	
$R_{max}$	1.00 - 4.00	< 16.0
$R_z$ DIN	0.63 - 2.50	< 10.0
$R_a$	0.10 - 0.40	< 2.5



Table XXIII Slydring® for Piston

Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.
Bore Diameter	Groove Diameter	Groove Width	Thickness		HiMod®	
D <sub>N</sub> H9	d <sub>2</sub> h8	L <sub>2</sub> +0.2	W		HM061 HM062	POG2
8.0	4.9	2.5	1.55	GP4100080	●	
12.0	8.9	4.0	1.55	GP4300120	●	
<b>16.0</b>	<b>12.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300160</b>	●	
16.0	11.0	9.7	2.50	GP6900160	●	
18.0	13.0	9.7	2.50	GP6900180	●	
<b>20.0</b>	<b>16.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300200</b>	●	
20.0	15.0	9.7	2.50	GP6900200	●	
22.0	17.0	9.7	2.50	GP6900220	●	
24.0	19.0	9.7	2.50	GP6900240	●	
<b>25.0</b>	<b>21.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300250</b>	●	
<b>25.0</b>	<b>20.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500250</b>	●	<b>WR 20 25 5.6</b>
25.0	20.0	9.7	2.50	GP6900250	●	WR 20 25 9.7
26.0	21.0	9.7	2.50	GP6900260	●	
27.0	22.0	5.6	2.50	GP6500270	●	WR 22 27 5.6
27.0	22.0	9.7	2.50	GP6900270	●	WR 22 27 9.7
28.0	23.0	9.7	2.50	GP6900280	●	
30.0	25.0	5.6	2.50	GP6500300	●	WR 25 30 5.6
30.0	25.0	9.7	2.50	GP6900300	●	WR 25 30 9.7
<b>32.0</b>	<b>28.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300320</b>	●	
<b>32.0</b>	<b>27.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500320</b>	●	<b>WR 27 32 5.6</b>
32.0	27.0	9.7	2.50	GP6900320	●	WR 27 32 9.7
33.0	28.0	5.6	2.50	GP6500330	●	WR 28 33 5.6
35.0	31.9	4.0	1.55	GP4300350	●	
35.0	30.0	5.6	2.50	GP6500350	●	WR 30 35 5.6
35.0	30.0	9.7	2.50	GP6900350	●	WR 30 35 9.7
36.0	31.0	9.7	2.50	GP6900360	●	
37.0	32.0	5.6	2.50	GP6500370	●	WR 32 37 5.6
37.0	32.0	9.7	2.50	GP6900370	●	WR 32 37 9.7
38.0	33.0	9.7	2.50	GP6900380	●	
<b>40.0</b>	<b>35.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500400</b>	●	<b>WR 35 40 5.6</b>
40.0	35.0	9.7	2.50	GP6900400	●	WR 35 40 9.7
41.0	36.0	5.6	2.50	GP6500410	●	WR 36 41 5.6
41.0	36.0	9.7	2.50	GP6900410	●	WR 36 41 9.7
42.0	37.0	9.7	2.50	GP6900420	●	
45.0	40.0	5.6	2.50	GP6500450	●	WR 40 45 5.6
45.0	40.0	9.7	2.50	GP6900450	●	WR 40 45 9.7
45.0	40.0	15.0	2.50	GP7300450	●	
46.0	41.0	9.7	2.50	GP6900460	●	
47.0	42.0	9.7	2.50	GP6900470	●	

● B+S sizes available, same Ref. as Part No.

All sizes printed in bold type conform to ISO 10766 and should be preferred for use.



Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.
Bore Diameter	Groove Diameter	Groove Width	Thickness		HiMod®	
D <sub>N</sub> H9	d <sub>2</sub> h8	L <sub>2</sub> +0.2	W		HM061 HM062	POG2
48.0	43.0	5.6	2.50	GP6500480	●	WR 43 48 5.6
49.0	44.0	9.7	2.50	GP6900490	●	
<b>50.0</b>	<b>45.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500500</b>	●	<b>WR 45 50 5.6</b>
50.0	45.0	9.7	2.50	GP6900500	●	WR 45 50 9.7
50.0	45.0	15.0	2.50	GP7300500	●	
52.0	47.0	5.6	2.50	GP6500520	●	
52.0	47.0	9.7	2.50	GP6900520	●	
55.0	50.0	5.6	2.50	GP6500550	●	WR 50 55 5.6
55.0	50.0	9.7	2.50	GP6900550	●	WR 50 55 9.7
55.0	50.0	15.0	2.50	GP7300550	●	
57.0	52.0	5.6	2.50	GP6500570	●	
57.0	52.0	9.7	2.50	GP6900570	●	
58.0	53.0	9.7	2.50	GP6900580	●	
60.0	55.0	5.6	2.50	GP6500600	●	WR 55 60 6.5
60.0	55.0	9.7	2.50	GP6900600	●	WR 55 60 9.7
61.0	56.0	5.6	2.50	GP6500610	●	WR 56 61 6.5
61.0	56.0	9.7	2.50	GP6900610	●	WR 56 61 9.7
<b>63.0</b>	<b>58.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500630</b>	●	<b>WR 58 63 5.6</b>
<b>63.0</b>	<b>58.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6900630</b>	●	<b>WR 58 63 9.7</b>
65.0	60.0	5.6	2.50	GP6500650	●	WR 60 65 5.6
65.0	60.0	9.7	2.50	GP6900650	●	WR 60 65 9.7
65.0	60.0	15.0	2.50	GP7300650	●	
66.0	61.0	9.7	2.50	GP6900660	●	
68.0	63.0	5.6	2.50	GP6500680	●	WR 63 68 5.6
68.0	63.0	9.7	2.50	GP6900680	●	WR 63 68 9.7
68.0	63.0	15.0	2.50	GP7300680	●	
70.0	65.0	5.6	2.50	GP6500700	●	WR 65 70 5.6
70.0	65.0	9.7	2.50	GP6900700	●	WR 65 70 9.7
72.0	67.0	5.6	2.50	GP6500720	●	WR 67 72 5.6
75.0	70.0	5.6	2.50	GP6500750	●	WR 70 75 5.6
75.0	70.0	9.7	2.50	GP6900750	●	WR 70 75 9.7
75.0	70.0	15.0	2.50	GP7300750	●	
75.0	70.0	25.0	2.50	GP7500750	●	
77.0	72.0	9.7	2.50	GP6900770	●	
<b>80.0</b>	<b>75.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500800</b>	●	<b>WR 75 80 5.6</b>
<b>80.0</b>	<b>75.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6900800</b>	●	<b>WR 75 80 9.7</b>
85.0	80.0	5.6	2.50	GP6500850	●	WR 80 85 5.6
85.0	80.0	9.7	2.50	GP6900850	●	WR 80 85 9.7
85.0	80.0	15.0	2.50	GP7300850	●	

● B+S sizes available, same Ref. as Part No.

All sizes printed in bold type conform to ISO 10766 and should be preferred for use.



Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.
Bore Diameter	Groove Diameter	Groove Width	Thickness		HiMod®	
D <sub>N</sub> H9	d <sub>2</sub> h8	L <sub>2</sub> +0.2	W		HM061 HM062	POG2
88.0	83.0	15.0	2.50	GP7300880	●	WR 85 90 5.6
90.0	85.0	5.6	2.50	GP6500900	●	
90.0	85.0	9.7	2.50	GP6900900	●	
90.0	85.0	15.0	2.50	GP7300900	●	WR 90 95 5.6 WR 90 95 9.7
95.0	90.0	5.6	2.50	GP6500950	●	
95.0	90.0	9.7	2.50	GP6900950	●	
97.0	92.0	9.7	2.50	GP6900970	●	<b>WR 95 100 5.6</b> <b>WR 95 100 9.7</b>
<b>100.0</b>	<b>95.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6501000</b>	●	
<b>100.0</b>	<b>95.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901000</b>	●	
100.0	95.0	15.0	2.50	GP7301000	●	WR 100 105 5.6 WR 100 105 9.7
105.0	100.0	5.6	2.50	GP6501050	●	
105.0	100.0	9.7	2.50	GP6901050	●	
105.0	100.0	15.0	2.50	GP7301050	●	
110.0	105.0	9.7	2.50	GP6901100	●	
110.0	105.0	15.0	2.50	GP7301100	●	
115.0	110.0	9.7	2.50	GP6901150	●	
115.0	110.0	15.0	2.50	GP7301150	●	
120.0	115.0	9.7	2.50	GP6901200	●	
120.0	115.0	15.0	2.50	GP7301200	●	<b>WR 120 125 5.9</b> <b>WR 120 125 9.7</b>
<b>125.0</b>	<b>120.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6501250</b>	●	
<b>125.0</b>	<b>120.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901250</b>	●	
125.0	120.0	15.0	2.50	GP7301250	●	
130.0	125.0	15.0	2.50	GP7301300	●	
135.0	130.0	15.0	2.50	GP7301350	●	
<b>140.0</b>	<b>135.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901400</b>	●	
<b>140.0</b>	<b>135.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7301400</b>	●	
145.0	140.0	15.0	2.50	GP7301450	●	
<b>160.0</b>	<b>155.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7301600</b>	●	
<b>200.0</b>	<b>195.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7302000</b>	●	
215.0	210.0	15.0	2.50	GP7302150	●	

● B+S sizes available, same Ref. as Part No.

All sizes printed in bold type conform to ISO 10766 and should be preferred for use.



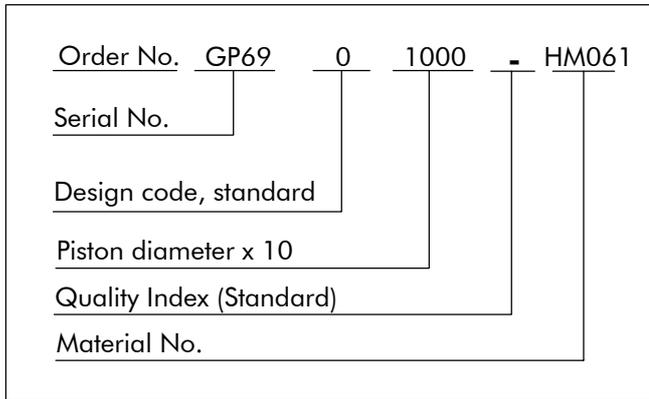
### Ordering Example

Slydring® for piston diameter  $D_N = 100.0$  mm  
Series GP69 from Table XIX  
Groove width: 9.70 mm, ring thickness: 2.50 mm

Material: HiMod® HM061  
(other materials see Tabel I)

Standard design: With angle cut  
Design code: 0

Order No.: GP6901000-HM061 (from Table XII)



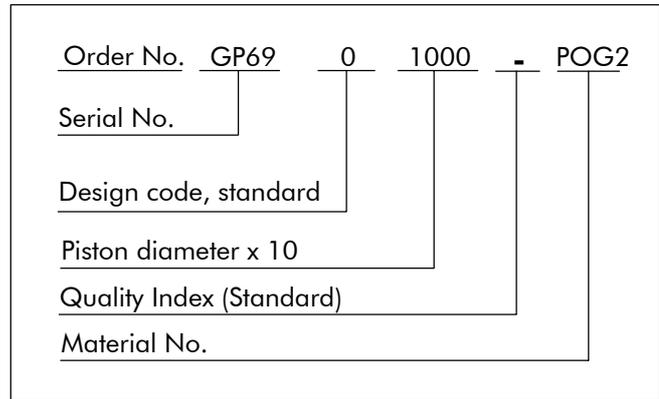
### Ordering Example

For Sealing Part Slydring® Ref. No. WR 95 100 9.7  
Piston diameter  $D_N = 100.0$  mm  
Groove width: 9.70 mm, ring thickness: 2.50 mm

Material: POG2

Standard design: With angle cut  
Design code: 0

Order No.: GP6901000-POG2





**Installation Recommendation, HiMod® Slydring® for Piston  
Non ISO 10766 Groove Dimension**

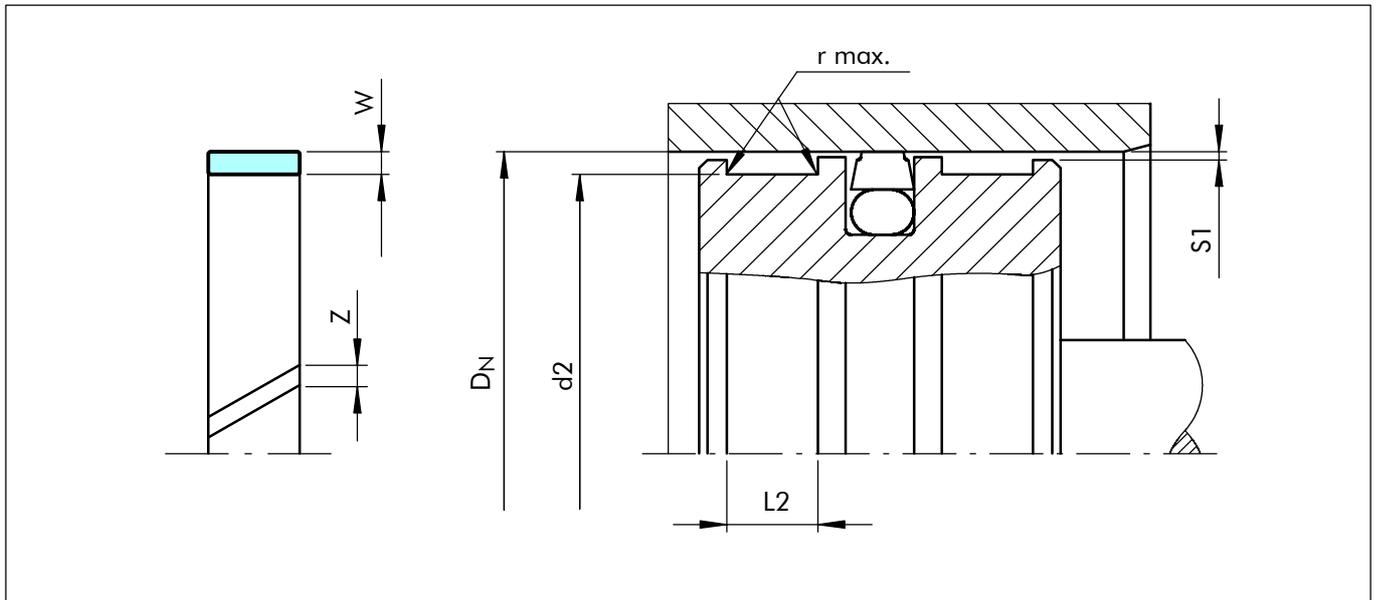


Figure 12 Installation drawing

**Table XXIV Slydring® for Piston**

Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.	Polypac Ref. No.			
Bore Diameter	Groove Diameter	Groove Width	Thickness					HiMod®		
D <sub>N</sub> H11	d <sub>2</sub> h9	L <sub>2</sub> +0.2	W					HM061/HM062	POG2	PO
16.0	12.0	9.7	2.00	GP4900160	●	WRE 16	E/DWR 16/2			
18.0	14.0	9.7	2.00	GP4900180	●	WRE 18				
20.0	16.0	9.7	2.00	GP4900200	●	WRE 20	E/DWR 20/2			
22.0	18.0	9.7	2.00	GP4900220	●	WRE 22				
24.0	20.0	9.7	2.00	GP4900240		WRE 24				
25.0	21.0	9.7	2.00	GP4900250		WRE 25	E/DWR 25/2			
26.0	22.0	9.7	2.00	GP4900260		WRE 26				
27.0	23.0	9.7	2.00	GP4900270		WRE 27				
28.0	24.0	9.7	2.00	GP4900280		WRE 28				
30.0	26.0	9.7	2.00	GP4900300		WRE 30	E/DWR 30/2			
32.0	28.0	9.7	2.00	GP4900320		WRE 32	E/DWR 32/2			
35.0	31.0	9.7	2.00	GP4900350		WRE 35	E/DWR 35/2			
36.0	32.0	9.7	2.00	GP4900360		WRE 36				
38.0	34.0	9.7	2.00	GP4900380		WRE 38				
39.0	35.0	9.7	2.00	GP4900390	●					
40.0	36.0	9.7	2.00	GP4900400		WRE 40	E/DWR 40/2			
42.0	38.0	9.7	2.00	GP4900420		WRE 42				
44.0	40.0	9.7	2.00	GP4900440	●					
45.0	41.0	9.7	2.00	GP4900450		WRE 45	E/DWR 45/2			

● B+S sizes available, same Ref. as Part No.



Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.	Polypac Ref. No.
Bore Diameter	Groove Diameter	Groove Width	Thickness		HiMod®		
D <sub>N</sub> H11	d <sub>2</sub> h9	L <sub>2</sub> +0.2	W		HM061/HM062	POG2	PO
46.0	42.0	9.7	2.00	GP4900460		WRE 46	
49.0	45.0	9.7	2.00	GP4900490	●		
50.0	46.0	9.7	2.00	GP4900500	●		
50.0	46.0	10.0	2.00	GP5100500	●		
50.0	44.0	9.7	3.00	GPN100500	●	WRE 50	E/DWR 50
52.0	46.0	12.8	3.00	GPP300520		WRE 52	
54.0	50.0	9.7	2.00	GP4900540	●		
55.0	51.0	9.7	2.00	GP4900550	●		
55.0	51.0	10.0	2.00	GP5100550	●		
55.0	49.0	12.8	3.00	GPN300550	●	WRE 55	E/DWR 55
59.0	55.0	9.7	2.00	GP4900590	●		
60.0	56.0	9.7	2.00	GP4900600	●		
60.0	54.0	12.8	3.00	GPN300600	●	WRE 60	E/DWR 60
62.0	56.0	12.8	3.00	GPP300620		WRE 62	
63.0	57.0	12.8	3.00	GPN300630	●	WRE 63	
65.0	61.0	9.7	2.00	GP4900650	●		
65.0	59.0	12.8	3.00	GPN300650	●	WRE 65	E/DWR 65
70.0	64.0	12.8	3.00	GPP300700	●	WRE 70	E/DWR 70
74.0	70.0	9.7	2.00	GP4900740	●		
75.0	71.0	9.7	2.00	GP4900750	●		
75.0	71.0	15.0	2.00	GP5300750	●		
75.0	69.0	12.8	3.00	GPN300750	●	WRE 75	E/DWR 75
80.0	76.0	9.7	2.00	GP4900800	●		
80.0	74.0	12.8	3.00	GPN300800	●	WRE 80	E/DWR 80
84.0	80.0	15.0	2.00	GP5300840	●		
85.0	81.0	9.7	2.00	GP4900850	●		
85.0	79.0	12.8	3.00	GPN300850	●	WRE 85	E/DWR 85
90.0	84.0	12.8	3.00	GPN300900	●	WRE 90	E/DWR 90
93.0	87.0	12.8	3.00	GPP300930		WRE 93	
94.0	90.0	15.0	2.00	GP5300940	●		
95.0	91.0	9.7	2.00	GP4900950	●		
95.0	89.0	12.8	3.00	GPN300950	●	WRE 95	E/DWR 95
95.0	91.0	15.0	2.00	GP5300950	●		
99.0	95.0	9.7	2.00	GP4900990	●		
100.0	96.0	9.7	2.00	GP4901000	●		
100.0	94.0	12.8	3.00	GPN301000	●	WRE 100	E/DWR 100
100.0	96.0	15.0	2.00	GP5301000	●		
104.0	100.0	20.0	2.00	GP5401040	●		
105.0	99.0	12.8	3.00	GPP301050		WRE 105	E/DWR 105

● B+S sizes available, same Ref. as Part No.



Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.	Polypac Ref. No.
Bore Diameter	Groove Diameter	Groove Width	Thickness		HiMod®		
D <sub>N</sub> H11	d <sub>2</sub> h9	L <sub>2</sub> +0.2	W		HM061/HM062	POG2	PO
105.0	101.0	15.0	2.00	GP5301050	●		
110.0	104.0	12.8	3.00	GPN301100	●	WRE 110	E/DWR 110
110.0	106.0	15.0	2.00	GP5301100	●		
110.0	106.0	20.0	2.00	GP5401100	●		
112.0	106.0	12.8	3.00	GPP301120		WRE 112	
114.0	110.0	20.0	2.00	GP5401140	●		
115.0	109.0	12.8	3.00	GPN301150	●	WRE 115	E/DWR 115
115.0	111.0	15.0	2.00	GP5301150	●		
120.0	114.0	12.8	3.00	GPN301200	●	WRE 120	E/DWR 120
125.0	119.0	12.8	3.00	GPN301250	●	WRE 125	E/DWR 125
125.0	121.0	15.0	2.00	GP5301250	●		
130.0	124.0	12.8	3.00	GPN301300	●	WRE 130	E/DWR 130
130.0	126.0	20.0	2.00	GP5401300	●		
135.0	129.0	12.8	3.00	GPP301350		WRE 135	E/DWR 135
140.0	134.0	12.8	3.00	GPN301400	●	WRE 140	E/DWR 140
140.0	136.0	15.0	2.00	GP5301400	●		
145.0	139.0	12.8	3.00	GPP301450		WRE 145	E/DWR 145
150.0	144.0	12.8	3.00	GPP301500		WRE 150	E/DWR 150
150.0	146.0	20.0	2.00	GP5401500	●		
155.0	149.0	19.2	3.00	GPP401550		WRE 155	E/DWR 155
160.0	154.0	19.2	3.00	GPN401600	●	WRE 160	E/DWR 160
165.0	159.0	19.2	3.00	GPP401650		WRE 165	E/DWR 165
170.0	164.0	19.2	3.00	GPN401700	●	WRE 170	E/DWR 170
170.0	166.0	20.0	2.00	GP5401700	●		
175.0	169.0	19.2	3.00	GPN401750	●	WRE 175	E/DWR 175
180.0	174.0	19.2	3.00	GPP401800		WRE 180	E/DWR 180
180.0	176.0	20.0	2.00	GP5401800	●		
185.0	179.0	19.2	3.00	GPP401850		WRE 185	E/DWR 185
190.0	184.0	19.2	3.00	GPP401900		WRE 190	E/DWR 190
195.0	189.0	19.2	3.00	GPP401950		WRE 195	E/DWR 195
200.0	194.0	19.2	3.00	GPP402000		WRE 200	E/DWR 200
205.0	199.0	19.2	3.00	GPP402050			E/DWR 205
210.0	204.0	19.2	3.00	GPP402100		WRE 210	E/DWR 210
215.0	209.0	19.2	3.00	GPP402150			E/DWR 215
220.0	214.0	19.2	3.00	GPP402200		WRE 220	E/DWR 220
225.0	219.0	19.2	3.00	GPP402250			E/DWR 225
230.0	224.0	19.2	3.00	GPP402300		WRE 230	E/DWR 230
235.0	229.0	19.2	3.00	GPP402350			E/DWR 235
240.0	234.0	19.2	3.00	GPP402400		WRE 240	E/DWR 240

● B+S sizes available, same Ref. as Part No.



Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.	Polypac Ref. No.
Bore Diameter	Groove Diameter	Groove Width	Thickness				
D <sub>N</sub> H11	d <sub>2</sub> h9	L <sub>2</sub> +0.2	W		HM061/HM062	POG2	PO
245.0	239.0	19.2	3.00	GPP402450	●	WRE 250	E/DWR 245
250.0	244.0	19.2	3.00	GPP402500			E/DWR 250
250.0	246.0	20.0	2.00	GP5402500			
255.0	249.0	19.2	3.00	GPP402550		WRE 260	E/DWR 255
260.0	254.0	19.2	3.00	GPP402600			E/DWR 260
265.0	259.0	19.2	3.00	GPP402650			E/DWR 265
270.0	264.0	19.2	3.00	GPP402700		WRE 270	E/DWR 270
275.0	269.0	19.2	3.00	GPP402750			E/DWR 275
280.0	274.0	19.2	3.00	GPP402800			E/DWR 280
285.0	279.0	19.2	3.00	GPP402850		WRE 290	E/DWR 285
290.0	284.0	19.2	3.00	GPP402900			E/DWR 290
295.0	289.0	19.2	3.00	GPP402950			E/DWR 295
300.0	294.0	19.2	3.00	GPP403000		WRE 300	E/DWR 300

● B+S sizes available, same Ref. as Part No.

**Table XXV Radial Clearance S1**

Bore Dia. D <sub>N</sub>	S1 min.	S1 max.
8 - 20	0.20	0.30
20 - 100	0.25	0.40
101 - 250	0.30	0.60
251 - 300	0.40	0.80



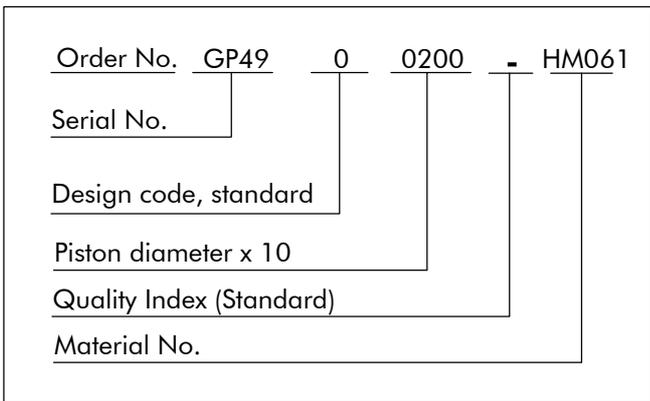
**Ordering Example**

Slydring® for piston diameter  $D_N = 20.0$  mm  
 Series GP49 from Table XVIII  
 Groove width: 9.70 mm, ring thickness: 2.00 mm

Material: HiMod® HM061  
 (other materials see Tabel I)

Standard design: With angle cut  
 Design code: 0

Order No.: GP4900200-HM061 (from Table XXIV)



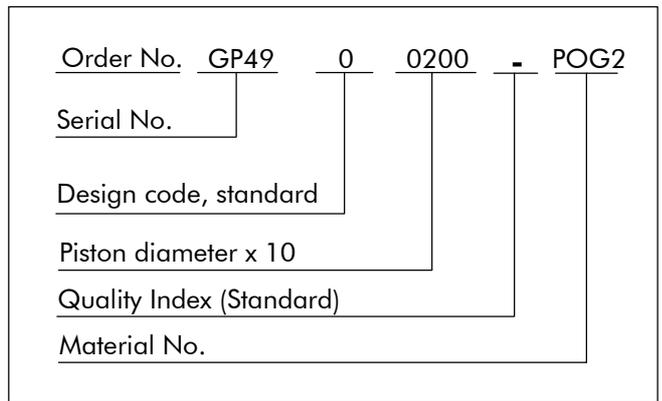
**Ordering Example**

For Sealing Part Slydring® Ref. No. WRE20  
 Piston diameter  $D_N = 20.0$  mm  
 Groove width: 9.70 mm, ring thickness: 2.00 mm

Material: POG2

Standard design: With angle cut  
 Design code: 0

Order No.: GP4900200-POG2



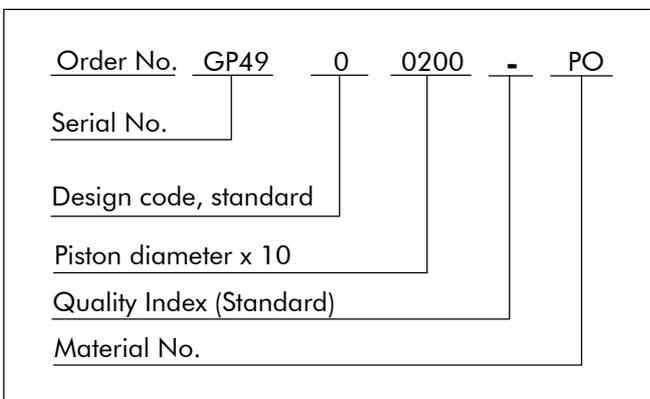
**Ordering Example**

For Polypac Slydring® Ref. No. E/DWR 20/2  
 Piston diameter  $D_N = 20.0$  mm  
 Groove width: 9.70 mm, ring thickness: 2.00 mm

Material: PO

Standard design: With angle cut  
 Design code: 0

Order No.: GP4900200-PO





**Installation Recommendation, HiMod® Slydring® for Rod According to ISO 10766 Groove Dimension**

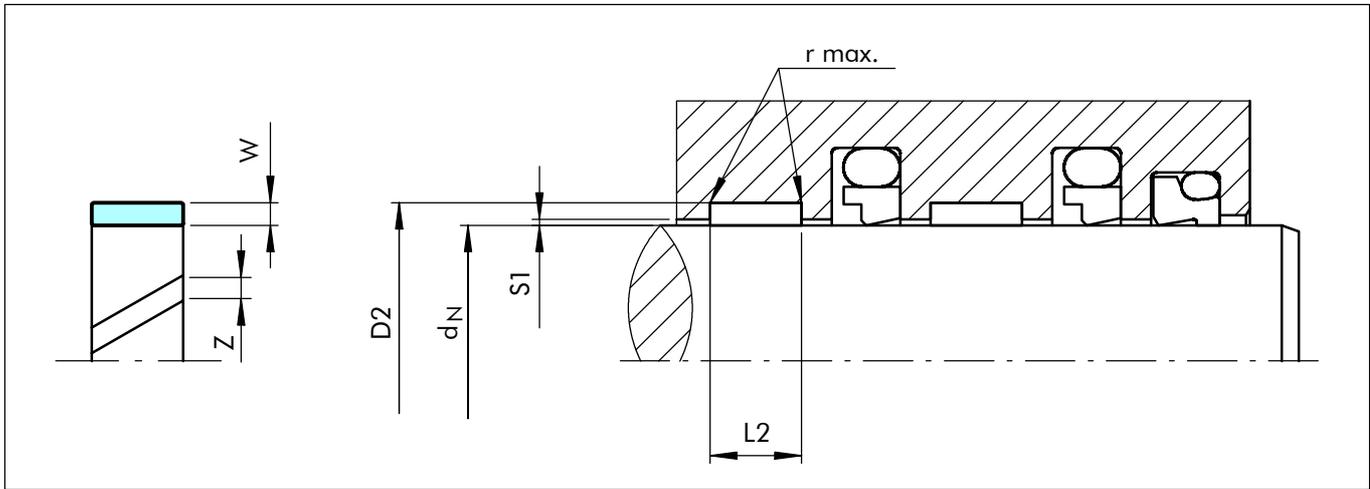


Figure 13 Installation drawing

**Table XXVI Installation Dimensions**

Serial No.	Rod Diameter <sup>1)</sup>	Groove Diameter	Groove Width	Ring Thickness	Ring Gap <sup>3)</sup>
	$d_N$ f8/h9	$D_2$ H8	$L_2 + 0.2$	$W$	$Z$
GR41	8 - 20.0	$d_N + 3.10$	2.50	1.55	1 - 2
GR43	10 - 50.0	$d_N + 3.10$	4.00	1.55	1 - 3
GR65	15 - 140.0	$d_N + 5.00$	5.60	2.50	2 - 5
GR69	20 - 220.0	$d_N + 5.00$	9.70	2.50	2 - 9
GR73	80 - 300.0	$d_N + 5.00$	15.00	2.50	4 - 15
GR75	200 - 300.0	$d_N + 5.00$	25.00	2.50	8 - 33

<sup>1)</sup> Recommended diameter ranges. <sup>3)</sup> Calculation of the straight length, see page 8.

For Slydring® to other standards, e.g French standard NF E 48-037, please contact us.

**Table XXVII Recommended Radii for Groove Dia.**

$d_N$	$r$ max.
8 - 250	0.2
>250	0.4

**Table XXVIII Radial Clearance S1 <sup>2)</sup>**

Rod Dia. $d_N$	S1 min.	S1 max.
8 - 20	0.20	0.30
20 - 100	0.25	0.40
101 - 250	0.30	0.60
251 - 300	0.40	0.80

<sup>2)</sup> Specifications valid only in the area of the Slydring®.

**Table XXIX Surface Roughness**

Parameter	Mating Surface $\mu\text{m}$	Groove Surface $\mu\text{m}$
	HiMod® Materials	
$R_{max}$	1.00 - 4.00	< 16.0
$R_z$ DIN	0.63 - 2.50	< 10.0
$R_a$	0.10 - 0.40	< 2.5



Table XXX Slydring® for Rods

Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.
Rod Diameter	Groove Diameter	Groove Width	Thickness		HiMod®	
$d_N$ f8/h9	$D_2$ H8	$L_2$ +0.2	W		HM061 HM062	POG2
8.0	11.1	2.5	1.55	GR4100080	●	
<b>12.0</b>	<b>15.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300120</b>	●	
15.0	18.1	4.0	1.55	GR4300150	●	
<b>16.0</b>	<b>19.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300160</b>	●	
<b>18.0</b>	<b>21.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300180</b>	●	
<b>20.0</b>	<b>23.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300200</b>	●	
20.0	25.0	5.6	2.50	GR6500200	●	WR 20 25 5.6
20.0	25.0	9.7	2.50	GR6900200	●	WR 20 25 9.7
22.0	27.0	5.6	2.50	GR6500220	●	WR 22 27 5.6
22.0	27.0	9.7	2.50	GR6900220	●	WR 22 27 9.7
<b>25.0</b>	<b>28.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300250</b>	●	
<b>25.0</b>	<b>30.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500250</b>	●	<b>WR 25 30 5.6</b>
25.0	30.0	9.7	2.50	GR6900250	●	WR 25 30 9.7
27.0	32.0	5.6	2.50	GR6500270	●	WR 27 32 5.6
27.0	32.0	9.7	2.50	GR6900270	●	WR 27 32 9.7
<b>28.0</b>	<b>31.1</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300280</b>	●	
<b>28.0</b>	<b>33.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500280</b>	●	<b>WR 28 33 5.6</b>
28.0	33.0	9.7	2.50	GR6900280	●	
30.0	35.0	5.6	2.50	GR6500300	●	WR 30 35 5.6
30.0	35.0	9.7	2.50	GR6900300	●	WR 30 35 9.7
<b>32.0</b>	<b>37.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500320</b>	●	<b>WR 32 37 5.6</b>
<b>32.0</b>	<b>37.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900320</b>	●	<b>WR 32 37 9.7</b>
35.0	40.0	5.6	2.50	GR6500350	●	WR 35 40 5.6
35.0	40.0	9.7	2.50	GR6900350	●	WR 35 40 9.7
<b>36.0</b>	<b>41.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500360</b>	●	<b>WR 36 41 5.6</b>
<b>36.0</b>	<b>41.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900360</b>	●	<b>WR 36 41 9.7</b>
<b>40.0</b>	<b>45.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500400</b>	●	<b>WR 40 45 5.6</b>
<b>40.0</b>	<b>45.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900400</b>	●	<b>WR 40 45 9.7</b>
40.0	45.0	15.0	2.50	GR7300400	●	
42.0	47.0	9.7	2.50	GR6900420	●	
44.0	49.0	9.7	2.50	GR6900440	●	
43.0	48.0	5.6	2.50	GR6500430	●	WR 43 48 5.6
<b>45.0</b>	<b>50.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500450</b>	●	<b>WR 45 50 5.6</b>
<b>45.0</b>	<b>50.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900450</b>	●	<b>WR 45 50 9.7</b>
45.0	50.0	15.0	2.50	GR7300450	●	
47.0	52.0	5.6	2.50	GR6500470	●	
47.0	52.0	9.7	2.50	GR6900470	●	
<b>50.0</b>	<b>55.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500500</b>	●	<b>WR 50 55 5.6</b>
<b>50.0</b>	<b>55.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900500</b>	●	<b>WR 50 55 9.7</b>

● B+S sizes available, same Ref. as Part No.

All sizes printed in bold type conform to ISO 10766 and should be preferred for use.



Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.
Rod Diameter	Groove Diameter	Groove Width	Thickness		HiMod®	
d <sub>N</sub> f8/h9	D <sub>2</sub> H8	L <sub>2</sub> +0.2	W		HM061 HM062	POG2
50.0	55.0	15.0	2.50	GR7300500	●	
52.0	57.0	5.6	2.50	GR6500520	●	
52.0	57.0	9.7	2.50	GR6900520	●	
53.0	58.0	9.7	2.50	GR6900530	●	
55.0	60.0	5.6	2.50	GR6500550	●	WR 55 60 5.6
55.0	60.0	9.7	2.50	GR6900550	●	WR 55 60 9.7
<b>56.0</b>	<b>61.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500560</b>	●	<b>WR 56 61 5.6</b>
<b>56.0</b>	<b>61.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900560</b>	●	<b>WR 56 61 9.7</b>
58.0	63.0	5.6	2.50	GR6500580	●	WR 58 63 5.6
58.0	63.0	9.7	2.50	GR6900580	●	WR 58 63 9.7
60.0	65.0	5.6	2.50	GR6500600	●	WR 60 65 5.6
60.0	65.0	9.7	2.50	GR6900600	●	WR 60 65 9.7
60.0	65.0	15.0	2.50	GR7300600	●	
61.0	66.0	9.7	2.50	GR6900610	●	
<b>63.0</b>	<b>68.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500630</b>	●	<b>WR 63 68 5.6</b>
<b>63.0</b>	<b>68.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900630</b>	●	<b>WR 63 68 9.7</b>
63.0	68.0	15.0	2.50	GR7300630	●	
65.0	70.0	5.6	2.50	GR6500650	●	WR 65 70 5.6
65.0	70.0	9.7	2.50	GR6900650	●	WR 65 70 9.7
67.0	72.0	5.6	2.50	GR6500670	●	
<b>70.0</b>	<b>75.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500700</b>	●	<b>WR 70 75 5.6</b>
<b>70.0</b>	<b>75.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900700</b>	●	<b>WR 70 75 9.7</b>
70.0	75.0	15.0	2.50	GR7300700	●	
72.0	77.0	9.7	2.50	GR6900720	●	
75.0	80.0	5.6	2.50	GR6500750	●	WR 75 80 5.6
75.0	80.0	9.7	2.50	GR6900750	●	WR 75 80 9.7
75.0	80.0	15.0	2.50	GR7300750	●	
80.0	85.0	5.6	2.50	GR6500800	●	WR 80 85 5.6
<b>80.0</b>	<b>85.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900800</b>	●	<b>WR 80 85 9.7</b>
<b>80.0</b>	<b>85.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7300800</b>	●	
83.0	88.0	15.0	2.50	GR7300830	●	
85.0	90.0	5.6	2.50	GR6500850	●	WR 85 90 5.6
85.0	90.0	9.7	2.50	GR6900850	●	
85.0	90.0	15.0	2.50	GR7300850	●	
90.0	95.0	5.6	2.50	GR6500900	●	WR 90 95 5.6
<b>90.0</b>	<b>95.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900900</b>	●	<b>WR 90 95 9.7</b>
92.0	97.0	9.7	2.50	GR6900920	●	
92.0	97.0	25.0	2.50	GR7500920	●	
95.0	100.0	5.6	2.50	GR6500950	●	WR 95 100 5.6

● B+S sizes available, same Ref. as Part No.

All sizes printed in bold type conform to ISO 10766 and should be preferred for use.



Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.
Rod Diameter	Groove Diameter	Groove Width	Thickness		HiMod®	
$d_N$ f8/h9	$D_2$ H8	$L_2$ +0.2	W		HM061 HM062	POG2
95.0	100.0	9.7	2.50	GR6900950	●	WR 95 100 9.7
95.0	100.0	15.0	2.50	GR7300950	●	
100.0	105.0	5.6	2.50	GR6501000	●	WR 100 105 5.6
<b>100.0</b>	<b>105.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901000</b>	●	<b>WR 100 105 9.7</b>
<b>100.0</b>	<b>105.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301000</b>	●	
105.0	110.0	9.7	2.50	GR6901050	●	WR 105 110 9.7
105.0	110.0	15.0	2.50	GR7301050	●	
<b>110.0</b>	<b>115.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901100</b>	●	
<b>110.0</b>	<b>115.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301100</b>	●	
115.0	120.0	9.7	2.50	GR6901150	●	
115.0	120.0	15.0	2.50	GR7301150	●	
120.0	125.0	5.6	2.50	GR6501200	●	WR 120 125 5.6
120.0	125.0	9.7	2.50	GR6901200	●	WR 120 125 9.7
120.0	125.0	15.0	2.50	GR7301200	●	
<b>125.0</b>	<b>130.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301250</b>	●	
130.0	135.0	15.0	2.50	GR7301300	●	
135.0	140.0	9.7	2.50	GR6901350	●	
135.0	140.0	15.0	2.50	GR7301350	●	
<b>140.0</b>	<b>145.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301400</b>	●	
155.0	160.0	15.0	2.50	GR7301550	●	
195.0	200.0	15.0	2.50	GR7301950	●	
210.0	215.0	15.0	2.50	GR7302100	●	

● B+S sizes available, same Ref. as Part No.

All sizes printed in bold type conform to ISO 10766 and should be preferred for use.



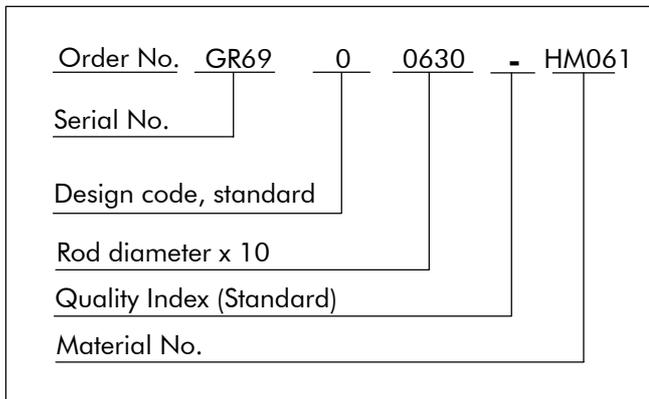
### Ordering Example

Slydring® for rod diameter  $d_N = 63.0$  mm  
Series GR69 from Table XXVI  
Groove width: 9.70 mm, ring thickness: 2.50 mm

Material: HiMod® HM061  
(other materials see Table I)

Standard design: With angle cut  
Design code: 0

Order No.: GR6900630-HM061  
(from Table XXX)



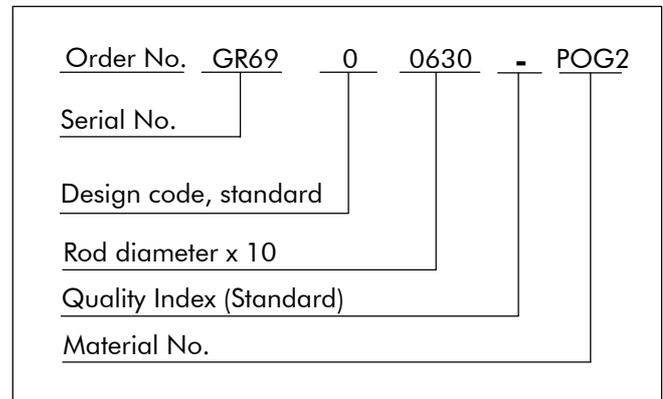
### Ordering Example

For Sealing Part Slydring® Ref. No. WR 63 68 9.7  
Rod diameter  $d_N = 63.0$  mm  
Groove width: 9.70 mm, ring thickness: 2.50 mm

Material: POG2  
(other materials see Table I)

Standard design: With angle cut  
Design code: 0

Order No.: GR6900630-POG2  
(from Table XXX)





■ Installation Recommendation, HiMod® Slydring® for Rod  
Non ISO 10766 Groove Dimension

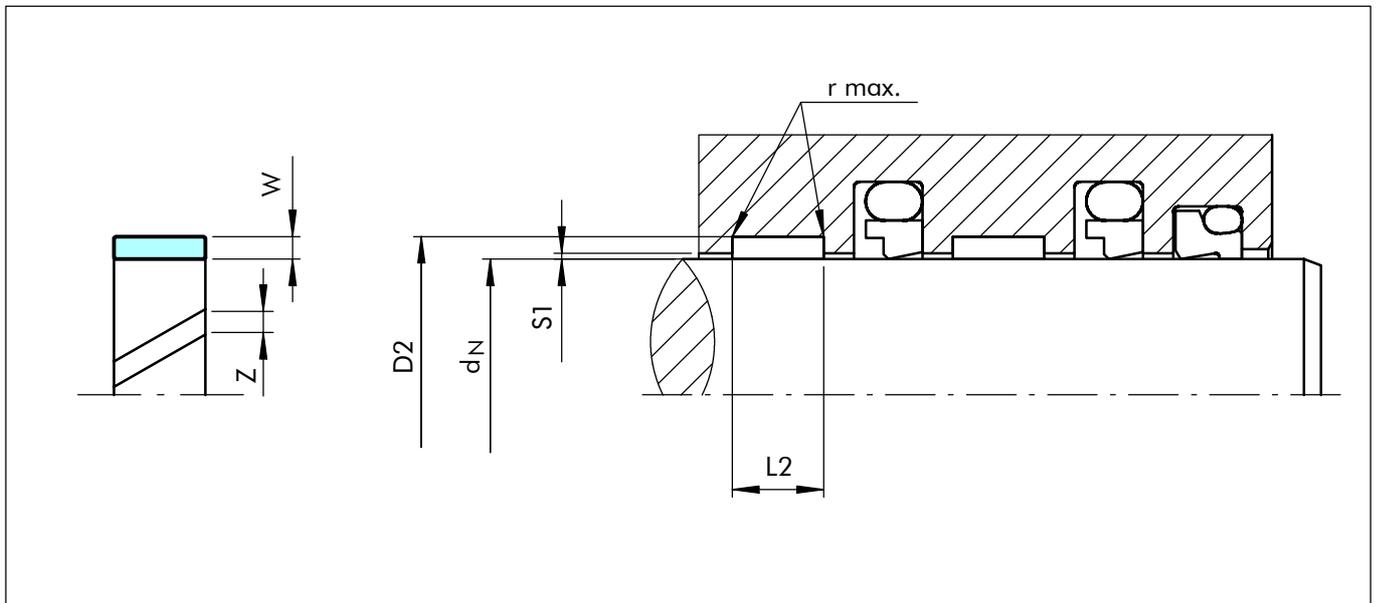


Figure 14 Installation drawing

Table XXXI Slydring® for Rod

Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.	Polypac Ref. No.			
Rod Diameter	Groove Diameter	Groove Width	Thickness					HiMod®		
$d_N$ h11	$D_2$ H8	$L_2 + 0.2$	$W$					HM061/HM062	POG2	PO
12.0	16.0	9.7	2.00	GR4900120		WRI 12	I/DWR 12/2			
14.0	18.0	9.7	2.00	GR4900140		WRI 14	I/DWR 14/2			
15.0	19.0	9.7	2.00	GR4900150		WRI 15				
16.0	20.0	9.7	2.00	GR4900160		WRI 16	I/DWR 16/2			
18.0	22.0	9.7	2.00	GR4900180		WRI 18	I/DWR 18/2			
20.0	24.0	9.7	2.00	GR4900200		WRI 20	I/DWR 20/2			
22.0	26.0	9.7	2.00	GR4900220		WRI 22	I/DWR 22/2			
24.0	28.0	9.7	2.00	GR4900240		WRI 24				
25.0	29.0	9.7	2.00	GR4900250		WRI 25	I/DWR 25/2			
26.0	30.0	9.7	2.00	GR4900260		WRI 26	I/DWR 26/2			
28.0	32.0	9.7	2.00	GR4900280		WRI 28	I/DWR 28/2			
30.0	34.0	9.7	2.00	GR4900300		WRI 30	I/DWR 30/2			
32.0	36.0	9.7	2.00	GR4900320		WRI 32	I/DWR 32/2			
34.0	38.0	9.7	2.00	GR4900340		WRI 34				
35.0	39.0	9.7	2.00	GR4900350	●	WRI 35	I/DWR 35/2			
36.0	40.0	9.7	2.00	GR4900360		WRI 36	I/DWR 36/2			
37.0	41.0	9.7	2.00	GR4900370		WRI 37				
38.0	42.0	9.7	2.00	GR4900380		WRI 38	I/DWR 38/2			

● B+S sizes available, same Ref. as Part No.



Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.	Polypac Ref. No.
Rod Diameter	Groove Diameter	Groove Width	Thickness		HiMod®		
d <sub>N</sub> h11	D <sub>2</sub> H8	L <sub>2</sub> +0.2	W		HM061/HM062	POG2	PO
40.0	44.0	9.7	2.00	GR4900400	●	WRI 40	I/DWR 40/2
42.0	46.0	9.7	2.00	GR4900420		WRI 42	
45.0	49.0	9.7	2.00	GR4900450	●		
45.0	51.0	9.7	3.00	GRN100450	●	WRI 45	I/DWR 45
46.0	50.0	9.7	2.00	GR4900460	●		
46.0	52.0	9.7	3.00	GRP100460		WRI 46	I/DWR 46
48.0	54.0	9.7	3.00	GRP100480		WRI 48	I/DWR 48
50.0	54.0	9.7	2.00	GR4900500	●		
50.0	56.0	9.7	3.00	GRN100500	●	WRI 50	I/DWR 50
51.0	55.0	10.0	2.00	GR5100510	●		
52.0	58.0	9.7	3.00	GRP100520		WRI 52	
53.0	59.0	9.7	3.00	GRP100530		WRI 53	I/DWR 53
55.0	59.0	9.7	2.00	GR4900550	●		
55.0	61.0	9.7	3.00	GRN100550	●	WRI 55	I/DWR 55
56.0	62.0	12.8	3.00	GRP300560		WRI 56	
58.0	64.0	12.8	3.00	GRP300580		WRI 58	
60.0	64.0	9.7	2.00	GR4900600	●		
60.0	66.0	12.8	3.00	GRN300600	●	WRI 60	I/DWR 60
61.0	67.0	12.8	3.00	GRP300610		WRI 61	
62.0	68.0	12.8	3.00	GRP300620		WRI 62	
63.0	69.0	12.8	3.00	GRP300630		WRI 63	I/DWR 63
65.0	71.0	12.8	3.00	GRP300650		WRI 65	I/DWR 65
66.0	72.0	12.8	3.00	GRP300660		WRI 66	
67.0	73.0	12.8	3.00	GRP300670		WRI 67	
70.0	74.0	9.7	2.00	GR4900700	●		
70.0	76.0	12.8	3.00	GRN300700	●	WRI 70	I/DWR 70
71.0	75.0	15.0	2.00	GR5300710	●		
72.0	78.0	12.8	3.00	GRN300720	●	WRI 72	
73.0	79.0	12.8	3.00	GRP300730		WRI 73	
75.0	81.0	12.8	3.00	GRN300750	●	WRI 75	I/DWR 75
76.0	82.0	12.8	3.00	GRP300760		WRI 76	
78.0	84.0	12.8	3.00	GRP300780		WRI 78	
80.0	84.0	9.7	2.00	GR4900800	●		
80.0	86.0	12.8	3.00	GRN300800	●	WRI 80	I/DWR 80
80.0	84.0	15.0	2.00	GR5300800	●		
82.0	88.0	12.8	3.00	GRP300820		WRI 82	
85.0	91.0	12.8	3.00	GRN300850	●	WRI 85	I/DWR 85
86.0	92.0	12.8	3.00	GRN300860	●	WRI 86	
90.0	96.0	12.8	3.00	GRN300900	●	WRI 90	I/DWR 90

● B+S sizes available, same Ref. as Part No.



Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.	Polypac Ref. No.
Rod Diameter	Groove Diameter	Groove Width	Thickness		HiMod®		
d <sub>N</sub> h11	D <sub>2</sub> H8	L <sub>2</sub> +0.2	W		HM061/HM062	POG2	PO
90.0	94.0	15.0	2.00	GR5300900	●		
91.0	97.0	12.8	3.00	GRP300910		WRI 91	
92.0	98.0	12.8	3.00	GRP300920		WRI 92	
93.0	99.0	12.8	3.00	GRP300930		WRI 93	
95.0	99.0	9.7	2.00	GR4900950	●		
95.0	101.0	12.8	3.00	GRP300950		WRI 95	I/DWR 95
96.0	100.0	15.0	2.00	GR5300960	●		
99.0	105.0	12.8	3.00	GRP300990		WRI 99	
100.0	104.0	9.7	2.00	GR4901000	●		
100.0	106.0	12.8	3.00	GRN301000	●	WRI 100	I/DWR 100
100.0	104.0	20.0	2.00	GR5401000	●		
101.0	105.0	15.0	2.00	GR5301010	●		
105.0	111.0	12.8	3.00	GRN301050	●	WRI 105	I/DWR 105
106.0	110.0	15.0	2.00	GR5301060	●		
110.0	116.0	12.8	3.00	GRN301100	●	WRI 110	I/DWR 110
110.0	114.0	20.0	2.00	GR5401100	●		
111.0	115.0	15.0	2.00	GR5301110	●		
113.0	119.0	12.8	3.00	GRP301130		WRI 113	
115.0	121.0	12.8	3.00	GRN301150	●	WRI 115	I/DWR 115
118.0	124.0	12.8	3.00	GRP301180		WRI 118	
120.0	126.0	12.8	3.00	GRN301200	●	WRI 120	I/DWR 120
121.0	125.0	15.0	2.00	GR5301210	●		
125.0	131.0	12.8	3.00	GRN301250	●	WRI 125	I/DWR 125
126.0	130.0	20.0	2.00	GR5401260	●		
130.0	136.0	12.8	3.00	GRN301300	●	WRI 130	I/DWR 130
135.0	141.0	12.8	3.00	GRN301350	●	WRI 135	I/DWR 135
136.0	140.0	15.0	2.00	GR5301360	●		
140.0	146.0	12.8	3.00	GRP301400		WRI 140	I/DWR 140
141.0	147.0	12.8	3.00	GRP301410		WRI 141	
142.0	148.0	12.8	3.00	GRP301420		WRI 142	
143.0	149.0	12.8	3.00	GRP301430		WRI 143	
145.0	151.0	12.8	3.00	GRP301450		WRI 145	I/DWR 145
146.0	150.0	20.0	2.00	GR5401460	●		
150.0	156.0	12.8	3.00	GRP301500		WRI 150	I/DWR 150
155.0	161.0	19.2	3.00	GRP401550		WRI 155	I/DWR 155
160.0	166.0	19.2	3.00	GRN401600	●	WRI 160	I/DWR 160
162.0	168.0	19.2	3.00	GRP401620		WRI 162	
165.0	171.0	19.2	3.00	GRP401650		WRI 165	I/DWR 165
166.0	170.0	20.0	2.00	GR5401660	●		

● B+S sizes available, same Ref. as Part No.



Dimensions				Part No.	B+S Ref.	Sealing Part Ref. No.	Polypac Ref. No.
Rod Diameter	Groove Diameter	Groove Width	Thickness		HiMod®		
$d_N$ h11	$D_2$ H8	$L_2 +0.2$	$W$		HM061/HM062	POG2	PO
170.0	176.0	19.2	3.00	GRN401700	●	WRI 170	I/DWR 170
175.0	181.0	19.2	3.00	GRP401750		WRI 175	I/DWR 175
176.0	180.0	20.0	2.00	GR5401760	●		
180.0	186.0	19.2	3.00	GRP401800		WRI 180	I/DWR 180
185.0	191.0	19.2	3.00	GRP401850		WRI 185	I/DWR 185
190.0	196.0	19.2	3.00	GRP401900		WRI 190	I/DWR 190
195.0	201.0	19.2	3.00	GRP401950		WRI 195	I/DWR 195
200.0	206.0	19.2	3.00	GRP402000		WRI 200	I/DWR 200
205.0	211.0	19.2	3.00	GRP402050		WRI 205	I/DWR 205
210.0	216.0	19.2	3.00	GRP402100		WRI 210	I/DWR 210
215.0	221.0	19.2	3.00	GRP402150		WRI 215	I/DWR 215
220.0	226.0	19.2	3.00	GRP402200		WRI 220	I/DWR 220
225.0	231.0	19.2	3.00	GRP402250		WRI 225	I/DWR 225
230.0	236.0	19.2	3.00	GRP402300		WRI 230	I/DWR 230
235.0	241.0	19.2	3.00	GRP402350		WRI 235	I/DWR 235
240.0	246.0	19.2	3.00	GRP402400		WRI 240	I/DWR 240
245.0	251.0	19.2	3.00	GRP402450		WRI 245	I/DWR 245
246.0	250.0	20.0	2.00	GR5402460	●		
248.0	254.0	19.2	3.00	GRP402480		WRI 248	
250.0	256.0	19.2	3.00	GRP402500		WRI 250	I/DWR 250
255.0	261.0	19.2	3.00	GRP402550			I/DWR 255
260.0	266.0	19.2	3.00	GRP402600		WRI 260	I/DWR 260
265.0	271.0	19.2	3.00	GRP402650			I/DWR 265
270.0	276.0	19.2	3.00	GRP402700		WRI 270	I/DWR 270
275.0	281.0	19.2	3.00	GRP402750			I/DWR 275
280.0	286.0	19.2	3.00	GRP402800		WRI 280	I/DWR 280
285.0	291.0	19.2	3.00	GRP402850			I/DWR 285
290.0	296.0	19.2	3.00	GRP402900		WRI 290	I/DWR 290
295.0	301.0	19.2	3.00	GRP402950			I/DWR 295

● B+S sizes available, same Ref. as Part No.

**Table XXXII Radial Clearance S1**

Rod Dia. $d_N$	S1 min.	S1 max.
8 - 20	0.20	0.30
20 - 100	0.25	0.40
101 - 250	0.30	0.60
251 - 500	0.40	0.80
501 - 1000	0.50	1.10
>1001	0.60	1.20



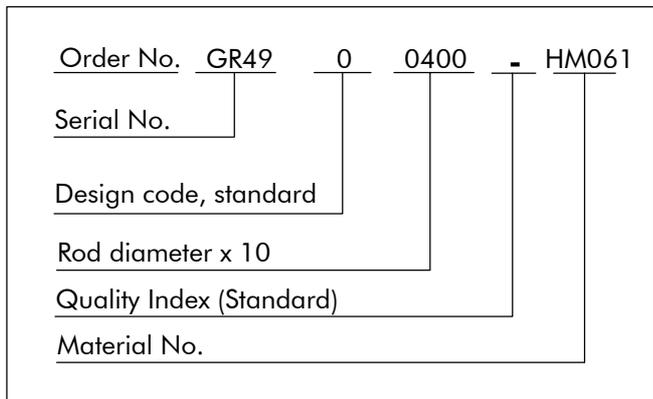
**Ordering Example**

Slydring® for rod diameter  $d_N = 40.0$  mm  
 Series GR49 from Table XVIII  
 Groove width: 9.70 mm, ring thickness: 2.00 mm

Material: HiMod® HM061  
 (other materials see Tabel I)

Standard design: With angle cut  
 Design code: 0

Order No.: GR4900400-HM061 (from Table XXXI)



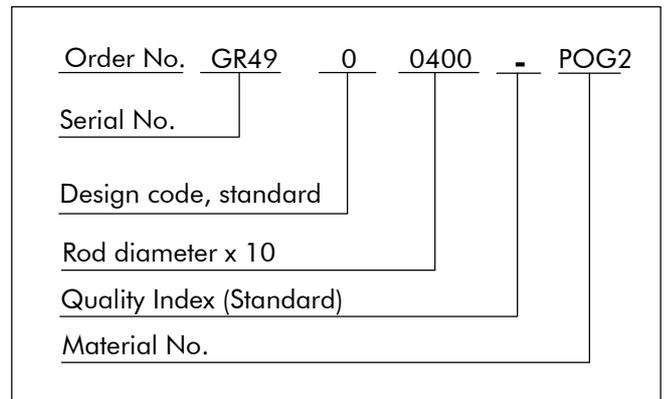
**Ordering Example**

For Sealing Part Slydring® Ref. No. WRI40  
 Rod diameter  $d_N = 40.0$  mm  
 Groove width: 9.70 mm, ring thickness: 2.00 mm

Material: POG2  
 (other materials see Tabel I)

Standard design: With angle cut  
 Design code: 0

Order No.: GR4900400-POG2 (from Table XXXI)



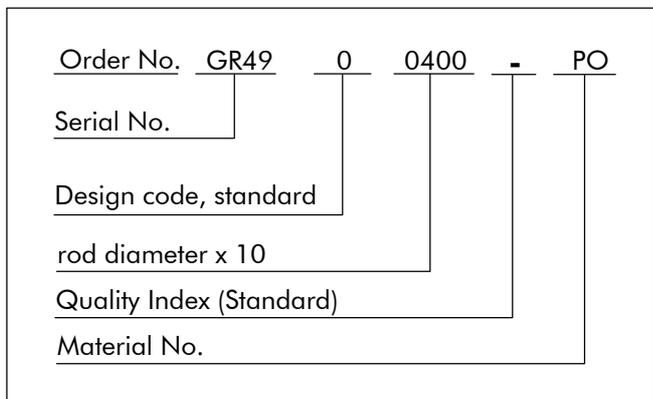
**Ordering Example**

For Polypac Slydring® Ref. No. I/DWR 40/2  
 Rod diameter  $d_N = 40.0$  mm  
 Groove width: 9.70 mm, ring thickness: 2.00 mm

Material: PO  
 (other materials see Tabel I)

Standard design: With angle cut  
 Design code: 0

Order No.: GR4900400-PO  
 (from Table XXXI)





## ■ Luytex® Slydring® for Piston and Rod

### Description

Luytex® Slydring® of fabric reinforced composite materials is used in hydraulic cylinders exposed to high loads that can occur e.g. in mobile hydraulics and presses. The high compressive strength, good sliding behaviour and the exceptional wear resistant properties ensure a long service life.

Slydring® of Luytex® fabric composite materials is produced as standard from tubular material. It is manufactured with a angle cut and already has the necessary gap "Z".

For large diameters > 300 mm, sections or segments can be produced from Luytex® C320, C380 strip material. This offers economical solutions for non-standard diameters or when quantities are limited. Strip material is coiled to a diameter of 200 to 300 mm and can be ordered either:

- cut and finished to the required length ( see page 6)
- coils at full lengths of 2 m or 3 m (see next page)

Strip material requires more care in fitting, in particular if the diameter is below 200 to 300 mm.

### Advantages

- Dimensionally stable and vibration absorbing
- Even distribution of high radial forces
- Good sliding and dry running properties
- High wear resistance
- Good wiping effect
- Long service life.

### Application Examples

Luytex® Slydring is widely used as a bearing element for heavy duty hydraulic equipment:

- Hydraulic actuators
- Mobile hydraulics
- Excavators
- Construction equipment
- Forrestry machinery
- Mining
- Steel mills
- Presses
- Water locks
- Marine engineering

### Technical Data

Velocity: Up to 1 m/s, with reciprocating movements

Temperature: - 60°C to + 130°C

Calculation values: (see page 7)

Compressive strength under dynamic operating conditions  
C380 & C320: 100 N/mm<sup>2</sup>

Note: Ultimate compressive strength perpendicular to laminate > 300 N/mm<sup>2</sup>

Compressive strength under dynamic operating conditions  
C931: 75 N/mm<sup>2</sup>

The permissible bearing load in service is dependent a/o. from operating temperature. If the operating temperature is in the range of 80 to 130°C a de-rating formula is applicable.

Please contact your local B+S company for further details.

Acceptable bearing load and velocity relate to each other because of heat build-up, therefore the maximum values for velocity and load should not be applied at the same time.

### Materials

#### Luytex® C320

Luytex® C320 is a fabric composite material made of a thermosetting polymer, reinforced by a fine plastic mesh and lubricant additives impregnated throughout the material. It has a very high resistance to wear, good dry-running properties and dampens vibrations. C320 has a dark gray colour

#### Luytex® C380

Luytex C380 is the standard material, this turquoise coloured composite is a further development of the proven C320. It is most versatile; suitable for all commonly used hydraulic fluids such as mineral or synthetic oils, as well as water based fluids. It is an excellent electrical insulator and features enhanced sliding properties in various media.

#### Luytex® C931

A composite of phenolic resin impregnated into a fine cotton fabric. It has good sliding properties and a noticeable resistance against the effects of dieseling. The material stiffness is higher than C380 / C320 thus restricting the load capacity. The use in water based fluids is not recommended. C931 has a yellow-brown colour.



**Table XXXIII Serial Numbers for Luytex® Slydring® finished parts, ready to fit**

Piston Serial No.	Rod Serial No.	Groove Width L <sub>2</sub>	Ring Thickness W
GP43	GR43	4.00	1.55
GP65	GR65	5.60	2.50
GP69	GR69	9.70	2.50
GP73	GR73	15.00	2.50
GP75	GR75	25.00	2.50
GP75X	GR75X	15.00	2.50
GP98	GR98	25.00	4.00
GP98X	GR98X	25.00	4.00

Note that customer specific sizes can be supplied without tooling costs.

**Table XXXIV Serial Numbers for coiled strip material C380 or C320**

Thickness	Groove Width	2m length	3m length
2.50	9.70	GM69A0000	--
2.50	15.00	GM73A0000	GM7330000
2.50	25.00	GM75A0000	GM7530000
4.00	25.00	GM9820000	GM9830000

**Installation Recommendations**

In order to protect the seal and guide system against ingress of foreign particles, which may occur in mobile hydraulic systems, we recommend the use of Turcite® Slydring® in combination with Luytex® Slydring®. The larger face area of these rings (Series GP 99 from Table IV) embeds the contaminant particles existing in the system and keeps them away from the actual guides and seals (Figure 15). The gap increase between the bottom and the rod side allows the particles to become embedded on the face side.

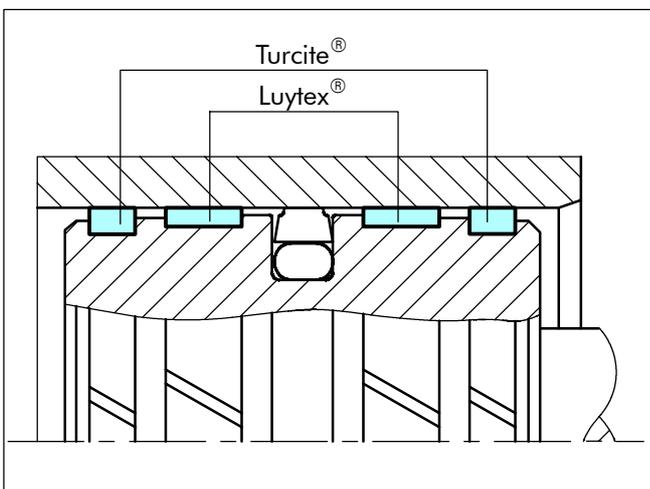


Figure 15 Arrangement of the Slydring® on the piston



**Installation Recommendation, Luytex® Slydring® for Piston According to ISO 10766 Groove Dimension**

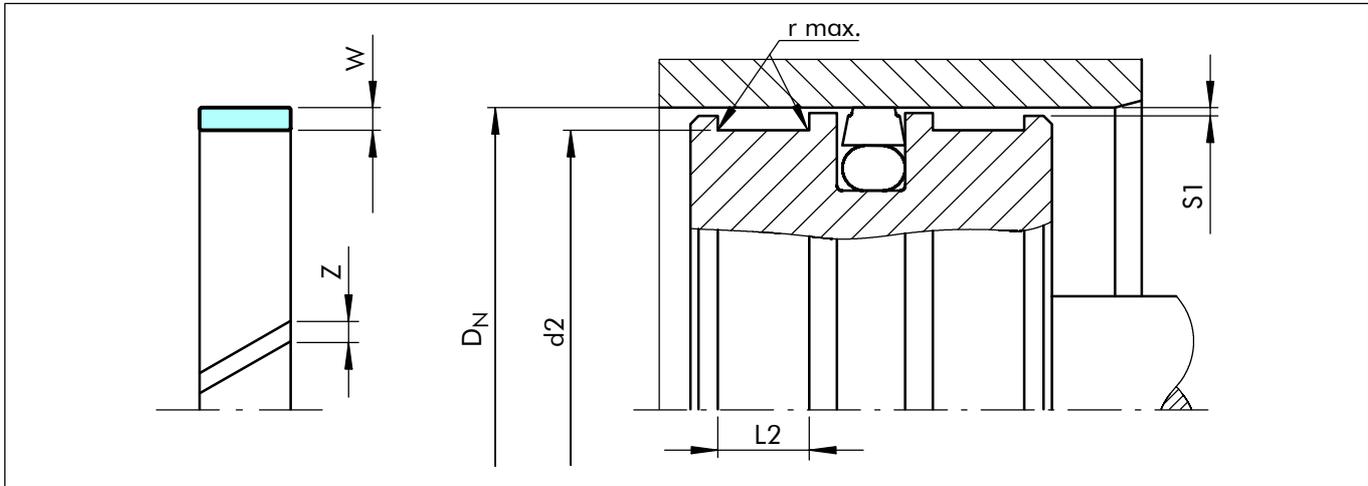


Figure 16 Installation drawing

**Table XXXV Installation Dimensions**

Serial No.	Bore Diameter <sup>1)</sup>	Groove Diameter	Groove Width	Ring Thickness	Ring Gap <sup>3)</sup>
	$D_N$ H9	$d_2$ h8	$L_2 + 0.2$	$W$	$Z$
GP43	10 - 50.0	$D_N - 3.10$	4.00	1.55	1 - 3
GP65	16 - 125.0	$D_N - 5.00$	5.60	2.50	2 - 6
GP69	25 - 250.0	$D_N - 5.00$	9.70	2.50	2 - 9
GP73	80 - 500.0	$D_N - 5.00$	15.00	2.50	4 - 17
GP75	125 - 999.9	$D_N - 5.00$	25.00	2.50	5 - 32
GP75X	1000 - 1500.0	$D_N - 5.00$	25.00	2.50	32 - 48
GP98	280 - 999.9	$D_N - 8.00$	25.00	4.00	10 - 33
GP98X	1000 - 1500.0	$D_N - 8.00$	25.00	4.00	33 - 48

<sup>1)</sup> Recommended diameter ranges. <sup>3)</sup> Calculation of the straight length, see page 8.

For Slydring® to other standards, e.g French standard NF E 48-037, please contact us.

**Table XXXVI Recommended Radii for Groove Dia.**

$D_N$	$r$ max.
8 - 250	0.2
>250	0.4

**Radial clearance S1**

The minimum radial gap is to be calculated taking into account;

- the fitting tolerances of the hardware
- the tolerance on the ring thickness
- an allowance for wear
- in case of high radial loads an allowance for elastic deformation
- a safety margin to avoid metal-to-metal contact

The gaps S1 can be chosen larger than near to the seal thus allowing slight tilting of the piston or bending of the rod, still without metal-to-metal contact.

It also allows foreign particles to be wiped away by the Slydring® rather than being squeezed between the metal

components (see page 8) The slot 'Z' allows fluid to pass across the ring thus preventing fluid pressure build-up which might cause extrusion of the guide ring. To ensure the ring cannot escape out of the groove it is recommended to observe following radial gap sizes as maximum:

- 0.50 mm for GP43 ( 1.55 mm thickness)
- 0.90 mm for GP65 to GP75 ( 2.50 mm thickness)
- 1.50 mm for GP98 and GP98X ( 4.00 mm thickness)

**Table XXXVII Surface Roughness**

Parameter	Mating Surface $\mu\text{m}$	Groove Surface $\mu\text{m}$
	Luytex® Materials	
$R_{\text{max}}$	1.00 - 4.00	< 16.0
$R_z$ DIN	0.63 - 2.50	< 10.0
$R_a$	0.10 - 0.40	< 2.5



Table XXXVIII Slydring® for Pistons

Dimensions				Part No.	Luytex® Material Ref.	
Bore Diameter	Groove Diameter	Groove Width	Thickness		C320/C380	C931
D <sub>N</sub> H9	d <sub>2</sub> h8	L <sub>2</sub> +0.2	W			
<b>16.0</b>	<b>11.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500160</b>	●	-
18.0	13.0	5.6	2.50	GP6500180	●	-
<b>20.0</b>	<b>15.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500200</b>	●	●
22.0	17.0	5.6	2.50	GP6500220	●	-
<b>25.0</b>	<b>20.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500250</b>	●	●
25.0	20.0	9.7	2.50	GP6900250	●	-
27.0	22.0	5.6	2.50	GP6500270	●	-
27.0	22.0	9.7	2.50	GP6900270	●	-
28.0	23.0	5.6	2.50	GP6500280	●	-
30.0	25.0	5.6	2.50	GP6500300	●	-
30.0	25.0	9.7	2.50	GP6900300	●	-
<b>32.0</b>	<b>28.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300320</b>	●	-
<b>32.0</b>	<b>27.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500320</b>	●	-
32.0	27.0	9.7	2.50	GP6900320	●	-
33.0	28.0	5.6	2.50	GP6500330	●	-
35.0	30.0	5.6	2.50	GP6500350	●	-
35.0	30.0	9.7	2.50	GP6900350	●	-
36.0	31.0	5.6	2.50	GP6500360	●	-
37.0	32.0	5.6	2.50	GP6500370	●	-
37.0	32.0	9.7	2.50	GP6900370	●	-
<b>40.0</b>	<b>36.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GP4300400</b>	●	-
<b>40.0</b>	<b>35.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500400</b>	●	●
40.0	35.0	9.7	2.50	GP6900400	●	●
41.0	36.0	5.6	2.50	GP6500410	●	-
41.0	36.0	9.7	2.50	GP6900410	●	-
42.0	37.0	5.6	2.50	GP6500420	●	-
45.0	40.0	5.6	2.50	GP6500450	●	-
45.0	40.0	9.7	2.50	GP6900450	●	-
48.0	43.0	5.6	2.50	GP6500480	●	-
<b>50.0</b>	<b>45.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500500</b>	●	●
50.0	45.0	9.7	2.50	GP6900500	●	●
52.0	47.0	5.6	2.50	GP6500520	●	-
55.0	50.0	5.6	2.50	GP6500550	●	-
55.0	50.0	9.7	2.50	GP6900550	●	-
56.0	51.0	5.6	2.50	GP6500560	●	-
60.0	55.0	5.6	2.50	GP6500600	●	●
60.0	55.0	9.7	2.50	GP6900600	●	●
61.0	56.0	5.6	2.50	GP6500610	●	-
61.0	56.0	9.7	2.50	GP6900610	●	-
<b>63.0</b>	<b>58.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500630</b>	●	●
<b>63.0</b>	<b>58.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6900630</b>	●	●
65.0	60.0	5.6	2.50	GP6500650	●	-

● Available sizes      - Not available      All sizes printed in bold type conform to ISO 10766 and should be preferred for use.



Dimensions				Part No.	Luytex® Material Ref.	
Bore Diameter	Groove Diameter	Groove Width	Thickness		C320/C380	C931
D <sub>N</sub> H9	d <sub>2</sub> h8	L <sub>2</sub> +0.2	W			
65.0	60.0	9.7	2.50	GP6900650	●	-
68.0	63.0	5.6	2.50	GP6500680	●	-
68.0	63.0	9.7	2.50	GP6900680	●	-
70.0	65.0	5.6	2.50	GP6500700	●	-
70.0	65.0	9.7	2.50	GP6900700	●	●
72.0	67.0	5.6	2.50	GP6500720	●	-
72.0	67.0	5.6	2.50	GP6500720	●	-
74.0	69.0	5.6	2.50	GP6500740	●	-
75.0	70.0	5.6	2.50	GP6500750	●	-
75.0	70.0	9.7	2.50	GP6900750	●	●
<b>80.0</b>	<b>75.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6500800</b>	●	●
<b>80.0</b>	<b>75.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6900800</b>	●	●
84.0	79.0	15.0	2.50	GP7300840	●	-
85.0	80.0	5.6	2.50	GP6500850	●	-
85.0	80.0	9.7	2.50	GP6900850	●	●
90.0	85.0	5.6	2.50	GP6500900	●	●
90.0	85.0	9.7	2.50	GP6900900	●	●
95.0	90.0	5.6	2.50	GP6500950	●	-
95.0	90.0	9.7	2.50	GP6900950	●	●
<b>100.0</b>	<b>95.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6501000</b>	●	●
<b>100.0</b>	<b>95.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901000</b>	●	●
100.0	95.0	15.0	2.50	GP7301000	●	-
105.0	100.0	5.6	2.50	GP6501050	●	-
105.0	100.0	9.7	2.50	GP6901050	●	-
110.0	105.0	9.7	2.50	GP6901100	●	●
115.0	110.0	9.7	2.50	GP6901150	●	-
120.0	115.0	9.7	2.50	GP6901200	●	●
<b>125.0</b>	<b>120.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GP6501250</b>	●	●
<b>125.0</b>	<b>120.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901250</b>	●	●
125.0	120.0	15.0	2.50	GP7301250	●	-
125.0	120.0	25.0	2.50	GP7501250	●	-
130.0	125.0	9.7	2.50	GP6901300	●	-
130.0	125.0	15.0	2.50	GP7301300	●	●
135.0	130.0	9.7	2.50	GP6901350	●	-
135.0	130.0	15.0	2.50	GP7301350	●	●
<b>140.0</b>	<b>135.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901400</b>	●	●
<b>140.0</b>	<b>135.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7301400</b>	●	●
150.0	145.0	15.0	2.50	GP7301500	●	●
150.0	145.0	25.0	2.50	GP7501500	●	-
<b>160.0</b>	<b>155.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901600</b>	●	●
<b>160.0</b>	<b>155.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7301600</b>	●	●
170.0	165.0	15.0	2.50	GP7301700	●	●

● Available sizes      - Not available      All sizes printed in bold type conform to ISO 10766 and should be preferred for use.



Dimensions				Part No.	Luytex® Material Ref.	
Bore Diameter	Groove Diameter	Groove Width	Thickness		C320/C380	C931
D <sub>N</sub> H9	d <sub>2</sub> h8	L <sub>2</sub> +0.2	W			
<b>180.0</b>	<b>175.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6901800</b>	●	●
<b>180.0</b>	<b>175.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7301800</b>	●	●
180.0	175.0	25.0	2.50	GP7501800	●	-
190.0	185.0	15.0	2.50	GP7301900	●	●
<b>200.0</b>	<b>195.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6902000</b>	●	●
<b>200.0</b>	<b>195.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7302000</b>	●	●
200.0	195.0	25.0	2.50	GP7502000	●	-
210.0	205.0	15.0	2.50	GP7302100	●	-
<b>220.0</b>	<b>215.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6902200</b>	●	●
<b>220.0</b>	<b>215.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7302200</b>	●	●
220.0	215.0	25.0	2.50	GP7502200	●	-
230.0	225.0	15.0	2.50	GP7302300	●	-
240.0	235.0	15.0	2.50	GP7302400	●	-
240.0	235.0	25.0	2.50	GP7502400	●	-
<b>250.0</b>	<b>245.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GP6902500</b>	●	●
<b>250.0</b>	<b>245.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7302500</b>	●	●
260.0	255.0	25.0	2.50	GP7502600	●	-
280.0	275.0	9.7	2.50	GP6902800	●	-
<b>280.0</b>	<b>275.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7302800</b>	●	●
<b>280.0</b>	<b>272.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9802800</b>	●	-
300.0	295.0	15.0	2.50	GP7303000	●	-
300.0	295.0	25.0	2.50	GP7503000	●	-
<b>320.0</b>	<b>315.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7303200</b>	●	-
<b>320.0</b>	<b>315.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GP7503200</b>	●	-
<b>320.0</b>	<b>312.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9803200</b>	●	-
350.0	345.0	25.0	2.50	GP7503500	●	-
<b>360.0</b>	<b>355.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7303600</b>	●	-
<b>360.0</b>	<b>355.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GP7503600</b>	●	-
<b>360.0</b>	<b>352.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9803600</b>	●	-
<b>400.0</b>	<b>395.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7304000</b>	●	-
<b>400.0</b>	<b>395.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GP7504000</b>	●	-
<b>400.0</b>	<b>392.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9804000</b>	●	-
420.0	415.0	25.0	2.50	GP7504200	●	-
<b>450.0</b>	<b>445.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7304500</b>	●	-
<b>450.0</b>	<b>445.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GP7504500</b>	●	-
<b>450.0</b>	<b>442.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9804500</b>	●	-
<b>500.0</b>	<b>495.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GP7305000</b>	●	-
<b>500.0</b>	<b>495.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GP7505000</b>	●	-
<b>500.0</b>	<b>492.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GP9805000</b>	●	-
1000.0	995.0	25.0	2.50	GP75X1000	●	●
1200.0	1195.0	25.0	2.50	GP75X1200	●	●
1500.0	1495.0	25.0	2.50	GP75X1500	●	-

● Available sizes      - Not available      All sizes printed in bold type conform to ISO 10766 and should be preferred for use.

Additional sizes not covered by this list are also held in stock. Also please note that customer specific sizes can be supplied without tooling costs.



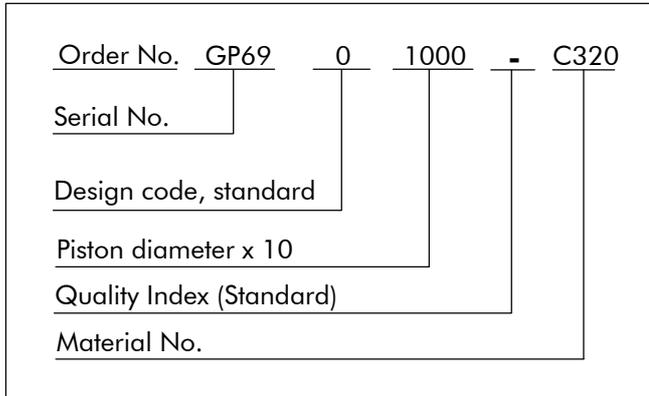
### Ordering Example

Slydring® for piston diameter  $D_N = 100.0$  mm  
Series GP 69 from Table VIII  
Groove width: 9.7 mm, ring thickness: 2.50 mm

Material: Luytex® C320  
(other materials see Tabel I)

Standard design: With angle cut and teardrop structure  
Design code: 0

Order No.: GP6901000-C320 (from Table XXXVIII)

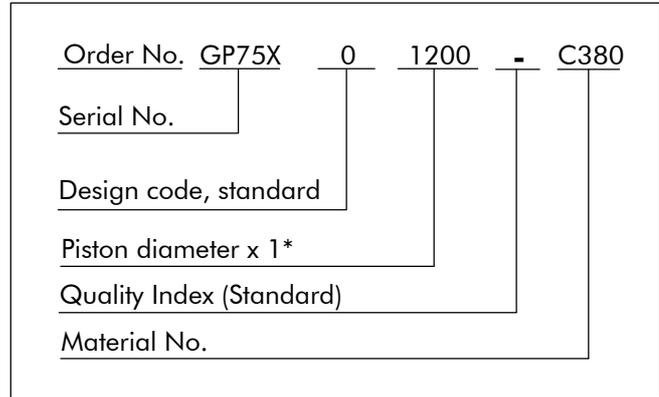


The Order No. can be formed from the example above.

### Ordering Example for diameter > 1000 mm

Slydring® for piston diameter  $D_N = 1200.0$  mm  
Series GP75X from Table XXXV  
Groove width: 25.0 mm, ring thickness: 2.50 mm  
Material: Luytex® C380

Order No.: GP75X1200-C380 (from Table XXXVIII)



\* For diameters  $\geq 1000.0$  mm multiply only by factor 1.



**Installation Recommendation, Luytex® Slydring® for Rod According to ISO 10766 Groove Dimension**

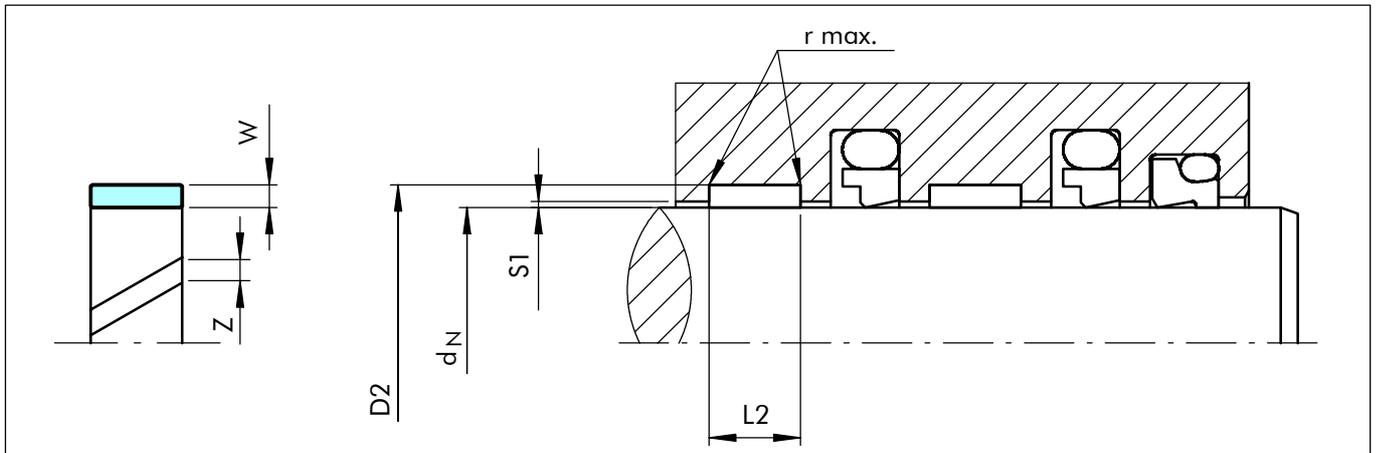


Figure 17 Installation drawing

**Table XXXIX Installation Dimensions**

Serial No.	Rod Diameter <sup>1)</sup>	Groove Diameter	Groove Width	Ring Thickness	Ring Gap <sup>3)</sup>
	$d_N$ f8/h9	$D_2$ H8	$L_2 + 0.2$	$W$	$Z$
GR43	8 - 50.0	$d_N + 3.10$	4.00	1.55	1 - 3
GR65	16 - 140.0	$d_N + 5.00$	5.60	2.50	2 - 6
GR69	25 - 250.0	$d_N + 5.00$	9.70	2.50	2 - 9
GR73	75 - 500.0	$d_N + 5.00$	15.00	2.50	4 - 17
GR75	120 - 999.9	$d_N + 5.00$	25.00	2.50	5 - 33
GR75X	1000-1500.0	$d_N + 5.00$	25.00	2.50	33- 49
GR98	280 - 999.9	$d_N + 8.00$	25.00	4.00	10 - 33
GR98X	1000-1500.0	$d_N + 8.00$	25.00	4.00	33 - 52

<sup>1)</sup> Recommended diameter ranges. <sup>3)</sup> Calculation of the straight length, see page 8.

For Slydring® to other standards, e.g French standard NF E 48-037, please contact us.

**Table XL Recommended Radii for Groove Dia.**

$d_N$	$r$ max.
8 - 250	0.2
>250	0.4

**Radial clearance S1**

The minimum radial gap is to be calculated taking into account;

- the fitting tolerances of the hardware
- the tolerance on the ring thickness
- an allowance for wear
- in case of high radial loads an allowance for elastic deformation
- a safety margin to avoid metal-to-metal contact

The gaps S1 can be chosen larger than near to the seal thus allowing slight tilting of the piston or bending of the rod, still without metal-to-metal contact. It also allows foreign particles to be wiped away by the Slydring® rather

than being squeezed between the metal components (see page 8). The slot 'Z' allows fluid to pass across the ring thus preventing fluid pressure build-up which might cause extrusion of the guide ring. To ensure the ring cannot escape out of the groove it is recommended to observe following radial gap sizes as maximum:

- 0.50 mm for GR43 ( 1.55 mm thickness)
- 0.90 mm for GR65 to GP75 ( 2.50 mm thickness)
- 1.50 mm for GR98 and GP98X ( 4.00 mm thickness)

**Table XLI Surface Roughness**

Parameter	Mating Surface $\mu\text{m}$	Groove Surface $\mu\text{m}$
	Luytex® Materials	
$R_{max}$	1.00 - 4.00	< 16.0
$R_z$ DIN	0.63 - 2.50	< 10.0
$R_a$	0.10 - 0.40	< 2.5



Table XLII Slydring® for Rods

Dimensions				Part No.	Luytex® Material ref.	
Rod Diameter	Groove Diameter	Groove Width	Thickness		C320/C380	C931
$d_N$ f8/h9	$D_2$ H8	$L_2 +0.2$	<b>W</b>			
11.0	7.9	4.0	1.55	GR4300110	●	-
15.0	11.9	4.0	1.55	GR4300150	●	-
16.0	21.0	5.6	2.50	GR6500160	●	●
18.0	23.0	5.6	2.50	GR6500180	●	●
20.0	25.0	5.6	2.50	GR6500200	●	●
22.0	27.0	5.6	2.50	GR6500220	●	●
22.0	27.0	9.7	2.50	GR6900220	●	●
25.0	30.0	9.7	2.50	GR6900250	●	●
27.0	32.0	9.7	2.50	GR6900270	●	-
<b>28.0</b>	<b>24.9</b>	<b>4.0</b>	<b>1.55</b>	<b>GR4300280</b>	●	-
<b>28.0</b>	<b>33.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500280</b>	●	●
28.0	33.0	9.7	2.50	GR6900280	●	●
30.0	35.0	5.6	2.50	GR6500300	●	●
30.0	35.0	9.7	2.50	GR6900300	●	●
<b>32.0</b>	<b>37.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500320</b>	●	●
<b>32.0</b>	<b>37.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900320</b>	●	●
35.0	40.0	9.7	2.50	GR6900350	●	●
<b>36.0</b>	<b>41.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500360</b>	●	●
<b>36.0</b>	<b>41.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900360</b>	●	●
36.0	41.0	15.0	2.50	GR7300360	●	-
<b>40.0</b>	<b>45.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500400</b>	●	●
<b>40.0</b>	<b>45.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900400</b>	●	●
40.0	45.0	15.0	2.50	GR7300400	●	●
42.0	47.0	5.6	2.50	GR6500420	●	●
43.0	48.0	5.6	2.50	GR6500430	●	-
<b>45.0</b>	<b>50.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500450</b>	●	●
<b>45.0</b>	<b>50.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900450</b>	●	●
45.0	50.0	15.0	2.50	GR7300450	●	●
48.0	53.0	5.6	2.50	GR6500480	●	●
48.0	53.0	9.7	2.50	GR6900480	●	●
<b>50.0</b>	<b>55.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500500</b>	●	●
<b>50.0</b>	<b>55.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900500</b>	●	●
52.0	57.0	5.6	2.50	GR6500520	●	●
52.0	57.0	9.7	2.50	GR6900520	●	●
55.0	60.0	5.6	2.50	GR6500550	●	●
55.0	60.0	9.7	2.50	GR6900550	●	●
55.0	60.0	15.0	2.50	GR7500550	●	-
<b>56.0</b>	<b>61.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500560</b>	●	●
<b>56.0</b>	<b>61.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900560</b>	●	●
58.0	63.0	5.6	2.50	GR6500580	●	●
58.0	63.0	9.7	2.50	GR6900580	●	●
60.0	65.0	5.6	2.50	GR6500600	●	●

● Available sizes      - Not available      All sizes printed in bold type conform to ISO 10766 and should be preferred for use.



Dimensions				Part No.	Luytex® Material ref.	
Rod Diameter	Groove Diameter	Groove Width	Thickness		C320/C380	C931
$d_N$ f8/h9	$D_2$ H8	$L_2$ +0.2	W			
60.0	65.0	9.7	2.50	GR6900600	●	●
60.0	65.0	15.0	2.50	GR7300600	●	-
<b>63.0</b>	<b>68.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500630</b>	●	●
<b>63.0</b>	<b>68.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900630</b>	●	●
63.0	68.0	15.0	2.50	GR7300630	●	●
65.0	70.0	5.6	2.50	GR6500650	●	●
65.0	70.0	9.7	2.50	GR6900650	●	●
<b>70.0</b>	<b>75.0</b>	<b>5.6</b>	<b>2.50</b>	<b>GR6500700</b>	●	●
<b>70.0</b>	<b>75.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900700</b>	●	●
70.0	75.0	15.0	2.50	GR7300700	●	●
75.0	80.0	5.6	2.50	GR6500750	●	●
75.0	80.0	9.7	2.50	GR6900750	●	●
75.0	80.0	15.0	2.50	GR7300750	●	●
80.0	85.0	5.6	2.50	GR6500800	●	●
<b>80.0</b>	<b>85.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900800</b>	●	●
<b>80.0</b>	<b>85.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7300800</b>	●	●
85.0	90.0	5.6	2.50	GR6500850	●	●
85.0	90.0	9.7	2.50	GR6900850	●	●
90.0	95.0	5.6	2.50	GR6500900	●	●
<b>90.0</b>	<b>95.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6900900</b>	●	●
<b>90.0</b>	<b>95.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7300900</b>	●	●
95.0	100.0	5.6	2.50	GR6500950	●	●
95.0	100.0	9.7	2.50	GR6900950	●	●
95.0	100.0	15.0	2.50	GR7300950	●	●
100.0	105.0	5.6	2.50	GR6501000	●	●
<b>100.0</b>	<b>105.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901000</b>	●	●
<b>100.0</b>	<b>105.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301000</b>	●	●
105.0	110.0	9.7	2.50	GR6901050	●	●
105.0	110.0	15.0	2.50	GR7301050	●	●
<b>110.0</b>	<b>115.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901100</b>	●	●
<b>110.0</b>	<b>115.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301100</b>	●	●
115.0	120.0	9.7	2.50	GR6901150	●	●
115.0	120.0	15.0	2.50	GR7301150	●	●
120.0	125.0	9.7	2.50	GR6901200	●	●
120.0	125.0	15.0	2.50	GR7301200	●	●
<b>125.0</b>	<b>130.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901250</b>	●	●
<b>125.0</b>	<b>130.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301250</b>	●	●
130.0	135.0	15.0	2.50	GR7301300	●	●
135.0	140.0	15.0	2.50	GR7301350	●	●
<b>140.0</b>	<b>145.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901400</b>	●	●
<b>140.0</b>	<b>145.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301400</b>	●	●
150.0	155.0	15.0	2.50	GR7301500	●	●

● Available sizes      - Not available      All sizes printed in bold type conform to ISO 10766 and should be preferred for use.



Dimensions				Part No.	Luytex® Material ref.	
Rod Diameter	Groove Diameter	Groove Width	Thickness		C320/C380	C931
d <sub>N</sub> f8/h9	D <sub>2</sub> H8	L <sub>2</sub> +0.2	W			
155.0	160.0	15.0	2.50	GR7301550	●	●
<b>160.0</b>	<b>165.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901600</b>	●	●
<b>160.0</b>	<b>165.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301600</b>	●	●
170.0	175.0	15.0	2.50	GR7301700	●	●
<b>180.0</b>	<b>185.0</b>	<b>9.7</b>	<b>2.50</b>	<b>GR6901800</b>	●	●
<b>180.0</b>	<b>185.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7301800</b>	●	●
190.0	195.0	15.0	2.50	GR7301900	●	●
195.0	200.0	15.0	2.50	GR7301950	●	●
<b>200.0</b>	<b>205.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7302000</b>	●	●
<b>200.0</b>	<b>205.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7502000</b>	●	●
210.0	215.0	15.0	2.50	GR7302100	●	●
<b>220.0</b>	<b>225.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7302200</b>	●	●
<b>220.0</b>	<b>225.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7502200</b>	●	●
230.0	235.0	25.0	2.50	GR7502300	●	●
240.0	245.0	25.0	2.50	GR7502400	●	●
<b>250.0</b>	<b>255.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7302500</b>	●	●
<b>250.0</b>	<b>255.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7502500</b>	●	●
<b>280.0</b>	<b>285.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7302800</b>	●	●
<b>280.0</b>	<b>285.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7502800</b>	●	●
<b>280.0</b>	<b>288.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GR9802800</b>	●	●
300.0	305.0	25.0	2.50	GR7503000	●	●
<b>320.0</b>	<b>325.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7303200</b>	●	●
<b>320.0</b>	<b>325.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7503200</b>	●	●
<b>320.0</b>	<b>328.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GR9803200</b>	●	●
350.0	355.0	25.0	2.50	GR7503500	●	●
<b>360.0</b>	<b>365.0</b>	<b>15.0</b>	<b>2.50</b>	<b>GR7303600</b>	●	●
<b>360.0</b>	<b>365.0</b>	<b>25.0</b>	<b>2.50</b>	<b>GR7503600</b>	●	●
<b>360.0</b>	<b>368.0</b>	<b>25.0</b>	<b>4.00</b>	<b>GR9803600</b>	●	●
400.0	405.0	25.0	2.50	GR7504000	●	●
400.0	408.0	25.0	4.00	GR9804000	●	●
800.0	805.0	25.0	2.50	GR7508000	●	●
800.0	808.0	25.0	4.00	GR9808000	●	●
1000.0	1005.0	25.0	2.50	GR75X1000	●	●
1000.0	1008.0	25.0	4.00	GR98X1000	●	●
1200.0	1205.0	25.0	2.50	GR75X1200	●	●
1500.0	1505.0	25.0	2.50	GR75X1500	●	-

● Available sizes      - Not available      All sizes printed in bold type conform to ISO 10766 and should be preferred for use.

Additional sizes not covered by this list are also held in stock. Also please note that customer specific sizes can be supplied without tooling costs.



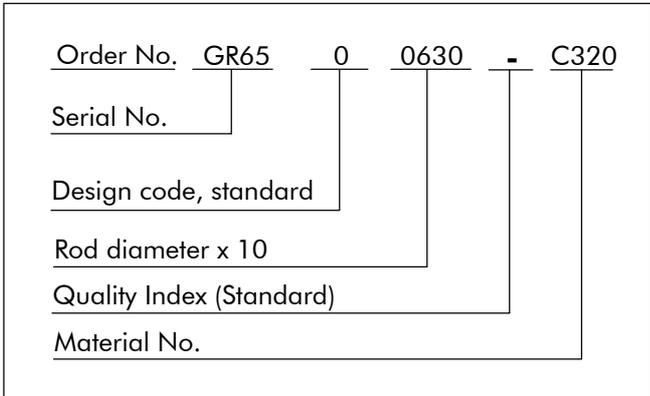
**Ordering Example**

Slydring® for rod diameter  $d_N = 63.0$  mm  
 Series GR 65 from Table XIII  
 Groove width: 5.6 mm, ring thickness: 2.50 mm

Material: Luytex® C320  
 (other materials see Table I)

Standard design: With angle cut  
 Design code: 0

Order No.: GR6500630-C320  
 (from Table XLII)

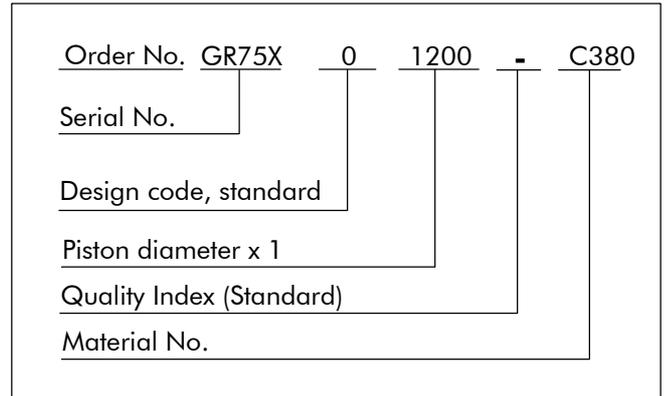


**Ordering Example for diameter >1000 mm**

Slydring® for rod diameter  $d_N = 1200.0$  mm  
 Series GR 75X from Table XXXIX  
 Groove width: 25.0 mm, ring thickness: 2.50 mm

Material: Luytex® C380

Order No.: GR75X1200-C380  
 (from Table XLII)



\* For diameters  $\geq 1000.0$  mm multiply only by factor 1.