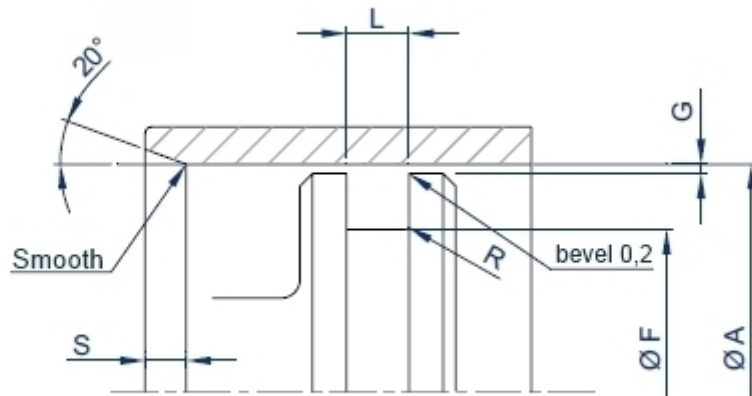




## Slipper ptfе Composite seals |Piston Slipper NPQ1



Slipper composite piston seals NPQ1 for Oil/gas applications



## SEAT

class	A cylinder bore range		F groove diameter	L groove width	R	S min.	G*	max. radial gap			closed groove if >=
	suggested	available						H8	H12	Bar 50	
N3	15 - 39.9	15 - 80	A- 11.0	4,2	0,8	2,6	0,6	0,5	0,25	0,15	30
N4	40 - 79.9	40 - 133	A- 15,5	6,3	1	5,6	0,7	0,5	0,3	0,2	50
N5	80 - 132.9	80 - 260	A- 21.0	8,1	1,5	8,2	0,9	0,6	0,3	0,2	80
N6	133 - 252.9	80 - 260	A- 24,5	8,1	1,5	8,2	1	0,7	0,35	0,2	133
N7	253 - 462.9	253 - 700	A- 28,0	9,5	2	12	1	0,7	0,4	0,25	320
N8	463 - 700	450 - 700	A- 35.0	11.5	3	15	1,1	0,75	0,45	0,25	463

$G^* = G1 + G2 + G3$   
 G1 = Max. initial clearance  
 G2 = Clearance by elastic deformation of the components under pressure  
 G3 = Clearance due to the foreseen wear of the guiding elements

### Coding example

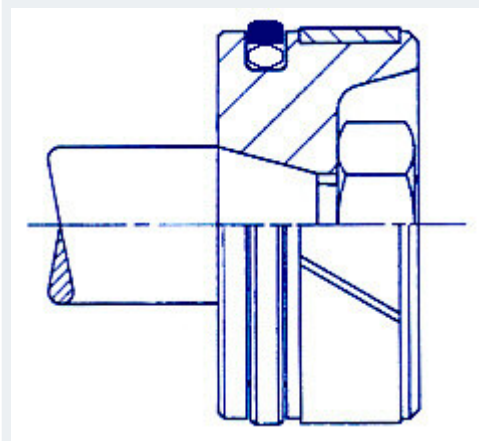
profile code NPQ1  
 bore 100  
 housing class N5  
 materials: Neuflon 031 O-Ring NBR

**Slipper NPQ1 - 100 - N5 - N-031 - NBR**

## ASSEMBLY

### SLIPPER COMPOSITE SEALS ASSEMBLING INSTRUCTIONS

#### ASSEMBLY ON PISTON IN CLOSED GROOVE AND IN OPEN GROOVE



Assembly in closed groove can be carried out manually, however the use of the appropriate equipment guarantees the integrity of the slipper and time-saving insertion.

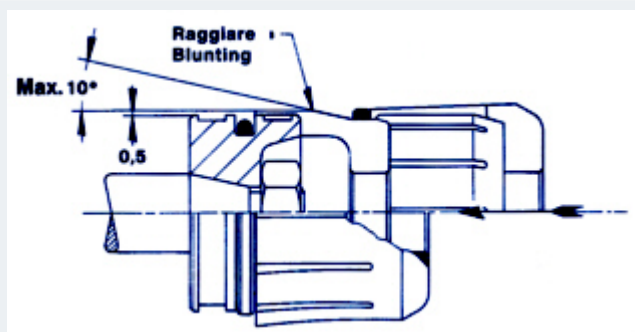
Assembly in open groove is suggested for slippers exceeding the dimensions shown in dimensional table.

Correctly carried out introduction blunting and the lubrication of the surfaces make assembly easier.

For an easier assembling in closed groove the preheating of the Slipper in oil or water bath at 90-100°C is suggested.



#### INSERTION AND RECALIBRATION EQUIPMENT FOR INSTALLATION IN CLOSED GROOVES ON THE PISTON



The expander cone brings the Slipper to the diameter of the piston, or to the edge of the groove when other existing grooves must be passed over.

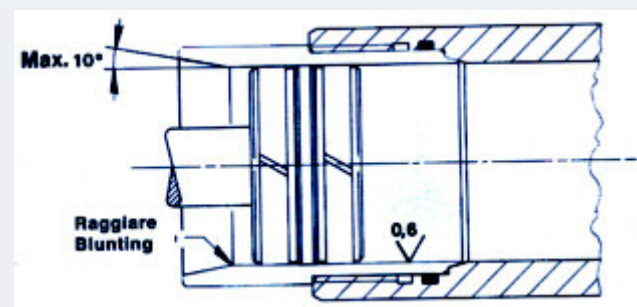
The thruster expands sector by sector, or more simply, in single longitudinal cutting.

Both the cone and thruster can be made in acetal resin (POM), polyester (PBTF) or polyamide (PA6)

The prolonged extended permanence of the Slipper during installation could determine a permanent increase in diameter; therefore fast installation is advised.

Recalibration of the slipper may be opportune using a sleeve before insertion of the piston in the cylinder.

The sleeve also allows the passing over of grooves and threads.



#### INSTALLATION ON THE CYLYNDER IN CLOSED GROOVE

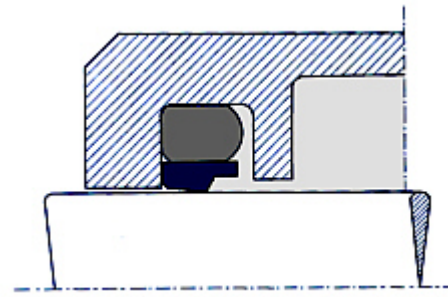
The Slipper seal can be introduced in the closed groove imposing a reniform deformation.

The radius **R** should never be little then 3 times **S**

Open groove



installation is advised for rods exceeding the diameter shown in dimensional table.



The mono-directional R type Slipper is installed using this method of positioning the seal-front towards the pressure.



## FINISHES

SURFACE FINISH ACCORDING WITH FLUID		
application	max Ra $\mu\text{m}$ dynamic surface	max Ra $\mu\text{m}$ static surface
CRYOGENICS	0,1	0,2
FREON HELIUM HYDROGEN	0,2	0,3
AIR NITROGEN ARGON METHANE FUELS	0.2	0.4
WATER OIL	0.3 - 04	0.6
ROTARY SEALS		
<b>Shaft surface</b> Ra 0.2 - 0.3 micron max. Rz 1.0 - 2.5 micron max. R max. < 4 micron	<b>Shaft hardness</b> 55 HRC min. for pressure up to 5 bar 60 HRC min. for pressure > di 5 bar 60 HRC for speed > 4m/sec	<b>Surface treating deep</b> 0.3 mm min.



## AVAILABILITY

**To check the availability:**

- choose profile and compound from the drop-down menu
  - input the desired housing class
  - input the desired diameter
- Once obtained the availability, a request for quotation can be sent.



## MATERIALS

Click compound's code to download the .PDF data sheet. Registration required.

HD Slippers code	Composition	Color	Approvals	ΔT °C	Description
<a href="#">N-020</a>	Virgin PTFE	white	<b>FDA</b> <b>NORSOK</b>	-268 +260	All purpose, low friction coefficient, extrusion withstanding.
<a href="#">N-009</a>	Ptfe-oxides	blue	<b>FDA</b>	-268 +260	All purpose on soft surfaces
<a href="#">N-031</a>	Ptfe-bronze	green-blue		-268 +260	High wear resistance, hidraulic seals
<a href="#">N-032</a>	Ptfe-carbon	black		-268 +260	High wear resistance, pneumatic and hydraulic seals
<a href="#">N-059</a>	Ptfe-carbographite	black		-268 +260	High wear resistance, hydraulic and pneumatic seals, hard surfaces
<a href="#">N-197</a>	Ptfe-carbographite	black	<b>NORSOK</b>	-268 +260	High wear resistance, hydraulic and pneumatic seals
<a href="#">N-043</a>	Ptfe-graphite	black	<b>FDA</b>	-268 +260	High wear resistance, low friction coefficient.
<a href="#">N-103</a>	Ptfe-carbon fibre	black	<b>FDA</b>	-268 +260	High wear resistance, low friction coefficient, hard surfaces.
<a href="#">N-077</a>	Ptfe-glass fibre-MoS <sub>2</sub>	gray		-268 +260	Of general use, in lubricated applications, rotary seals
<a href="#">N-060</a>	Ptfe-glass fibre	blue	<b>FDA</b>	-268 +260	All purpose on hard surfaces
<a href="#">N-067</a>	Ptfe-glass fibre	white	<b>FDA</b> <b>NORSOK</b>	-268 +260	High wear and creep resistance
<a href="#">N-102</a>	Ptfe-Liquid crystal polymer	beige	<b>FDA - EU</b>	-268 +260	Food & Pharma, soft surfaces
<a href="#">N-088</a>	Ptfe-poliimide	yellow		-268 +260	High wear resistance. Soft surfaces
<a href="#">N-074</a>	PEHMW	white	<b>FDA</b>	-140 +80	High wear and extrusion resistance
<a href="#">P95-A252</a>	Polyurethane	blue	<b>FDA</b>	-50 +105	Extrusion and wear withstanding, low friction coefficient
<a href="#">P95-VI251</a>	Polyurethane	violet	<b>FDA</b>	-30 +115	CIP (clean in place) fluids compatible
<a href="#">P95-R198</a>	Polyurethane	red		-30 +125	Extrusion and wear withstanding, low friction coefficient, high temperatures
<a href="#">P95-AR255</a>	Polyurethane	orange		-30 +135	Extrusion and wear withstanding, low friction coefficient, higher temperatures
<a href="#">P95-G253</a>	Polyurethane MoS	gray		-30 +105	Extrusion and wear withstanding, lower friction coefficient

### CHOOSING Neuflon-ptfe compound ACCORDING WITH FLUID AND SURFACE

#### SURFACES

Steel HEC>=30-45  
Temp. Mart. Inox Steel  
Cast Iron HRB<=200  
Steel HRC>=45  
Cast Iron HRB>200

Galvanic or chemical  
surfacing HV>=700  
Chromium Bronze

Bronze  
Brass

Treated  
Aluminium

Aust. Inox Steel  
Glass

#### FLUIDS

#### NEUFロン-ptfe compounds (standard in bold)

Hydraulic oil  
Transmission oil  
Fire resistant syntetic  
hydraulic oil

**N-031**  
N-032 N-060 N-077 P95-A112

**N-031**  
N-032 N-060 N-077 P95-A112

**N-009**  
N-043 N-032 P95-A112

**N-032**  
N-074 P95-A112

**N-009**  
N-032 N-074 P95-A112

Water and oil/water

**N-032**

**N-032**

**N-009**

**N-032**

**N-009**



emulsions	N-060 N-077 N-074	N-060 N-077 N-074	N-043 N-074	N-074	N-032 N-074
Drugs and food	<b>N-009</b> N-102 N-020 N-043 N-060 N-074 N-088 P95-B113	<b>N-009</b> N-074 P95-B113	<b>N-102</b> N-009 P95-B113	<b>N-009</b> N-074 P95-B113	<b>N-009</b> N-074 P95-B113
Air	<b>N-032</b> N-031 N-043 N-074 P95-A112	<b>N-032</b> N-043 P95-A112	<b>N-032</b> N-009 N-043 N-074 P95-A112	<b>N-032</b> N-074 P95-A112	<b>N-032</b> N-009 N-043 N-074 P95-A112
Steam	<b>N-032</b> N-043	<b>N-032</b>	<b>N-009</b> N-032 N-043		<b>N-032</b> N-009 N-043
Acids and Bases	<b>N-032</b> N-059 N-074	<b>N-032</b> N-043 N-074			<b>N-009</b> N-032 N-043 N-074

#### ELASTOMER ACCORDING WITH FLUID

FLUID	ELASTOMER
HYDRAULIC OIL - TRANSMISSION OIL	NBR
FIRE RESISTANT SYNTETIC HYDRAULIC OIL	EPDM
WATER AND WATER/OIL EMULSIONS	NBR
FOOD AND DRUG	MVQ
AIR	NBR
STEAM	EPDM - FFKM
ACIDS AND BASES	FKM - FFKM