K39 ROD SEAL

K39 is a single acting rod seal which consists of reinforced cotton fabric and nitrile rubber vulcanized together forming an integral sealing element.

PRODUCT ADVANTAGES

- Functions even with poor surfaces
- Reinforced cotton fabric base prevents the seal from extrusion
- Good sealing at low pressures

APPLICATION

Mobile hydraulics and Standard cylinders

MATERIAL		CODE
NBR	80 SHORE A	NB8001
COTTON FABRIC NBR		NB8008

OPERATING CONDITIONS			
MEDIA	Mineral oils (DIN 51524)	HFA ve HFB	HFC
TEMPERATURE	-30°C +105°C	+5°C +60°C	-30°C +60°C
PRESSURE	≤250 Bar	≤250 Bar	≤250 Bar
SPEED	≤0.5 m/sec	≤0.5 m/sec	≤0.5 m/sec

Note: The above data are maximum values and cannot be used at the same time.

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	Ød	≤0.4 µm	≤3.2 µm
Groove Base	ØD	≤1.6 µm	≤10 µm
Groove Flanks	B	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value.

INSTALLATION

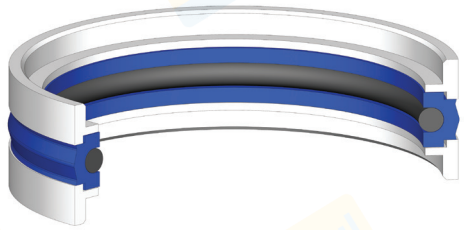
K39 is to be assembled into open grooves if rod diameter is less than 40 mm. It is very important that the assembly tools must be of soft material and have no sharp edges. Before installation the sealing element must be oiled with system oil.

NOTES

The permissible sealing gap values of K39 rod seal is given in the below table.

PERMISSIBLE SEALING GAP	
Pressure (Bar)	**Smax (mm)**
150	0.2
250	0.1

Note: The largest sealing gap value occurring on the non-pressurized side of the seal does have a vital importance for the function of the seal and in this respect it is quite important to use the S value lower than the above indicated numbers.



K46 is a four piece double acting compact seal consisting of polyurethane sealing ring with NBR energizer O-ring and two special profile guide rings made of thermoplastic to absorb transverse forces.

PRODUCT ADVANTAGES

- Superior sealing performance
- No requirement for an additional guide ring due to the compact design
- Economic sealing and guiding solution
- Simple groove design, one-piece piston possible
- Reducing piston machining costs due to low cross-section thickness
- Easy installation

APPLICATION

Agricultural machinery ,industrial applications

MATERIAL		CODE
PU	92 SHORE A	PU9201
POM		PM9901
NBR	70 SHORE A	NB7001

OPERATING CONDITIONS			
MEDIA	Mineral oils (DIN 51524)	HFA and HFB	HFC
TEMPERATURE	-30°C +100°C	+5°C +50°C	-30°C +40°C
PRESSURE	≤400 Bar	≤400 Bar	≤400 Bar
SPEED	≤0.5 m/sn	≤0.5 m/sn	≤0.5 m/sn

Note: The above data are maximum values and cannot be used at the same time.

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	ØD	≤0.4 µm	≤3.2 µm
Groove Base	Ød	≤1.6 µm	≤6.3 µm
Groove Flanks	B	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value.

INSTALLATION

Easily assembled into one-piece piston because the back-up rings and guide rings are been produced in split forms. It is very important that the assembly tools must be of soft material and have no sharp edges. Before installation the sealing element must be oiled with system oil.

K48 PISTON SEAL

K48 is a four piece double acting heavy duty piston seal which consists of one TPE profile ring, one elastomeric nitrile rubber to pre load sealing element and two thermoplastic back-up rings.

PRODUCT ADVANTAGES
- Simple groove design
- Superior performance in high and variable pressure
- Long service life
- Very good sealing performance at shock pressures
- High resistance to abrasion
- Ultimate resistance in water based fluids.

APPLICATION
Mining industry
Heavy duty applications

MATERIAL		CODE
NBR	80 SHORE A	NB8001
TPE		TP5501
POM		POM9901

OPERATING CONDITIONS		
MEDIA	Mineral oils (DIN 51524)	HFA and HFB
TEMPERATURE	-30°C +105°C	+5°C +60°C
PRESSURE	≤700 Bar	≤700 Bar
SPEED	≤0.3 m/sec	≤0.3 m/sec

Note: The above data are maximum values and cannot be used at the same time.

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	ØD	≤0.4 µm	≤4 µm
Groove Base	Ød	≤1.6 µm	≤10 µm
Groove Flanks	B	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value.

INSTALLATION
Easily assembled into one-piece piston because the back-up rings are been produced in split forms. It is very important that the assembly tools must be of soft material and have no sharp edges. Before installation the sealing element must be oiled with system oil.

NOTES
It is recommended to choose suitable material and quantity for guiding element regarding the purpose of application.

PERMISSIBLE SEALING GAP

Pressure(Bar)	Smax (mm)
P≤350	0.45
350P≤600	0.25

Note: The largest sealing gap value occurring on the non-pressurized side of the seal does have a vital importance for the function of the seal and in this respect it is quite important to use the S value lower than the above indicated numbers.

K49 PISTON SEAL

K49 is a two piece double acting sealing set which consists of a special design polyurethane seal ring and a NBR elastomer ring as energizer.

PRODUCT ADVANTAGES

- Superior static and dynamic sealing
- Ability to move without vibration even at low running speeds
- No twisting in the housing due to rectangular profile
- Standardized housings according to ISO 7425-1
- Easy installation
- Low axial housing heights

APPLICATION

- Construction machinery
- Agricultural machinery
- Injection molding machines
- General industrial applications

MATERIAL		CODE
PU	60 SHORE D	PU6401
NBR	80 SHORE A	NB8001

OPERATING CONDITIONS

MEDIA	Mineral oils (DIN 51524)	HFA and HFB	HFC
TEMPERATURE	-30°C +100°C	+5°C +50°C	-30°C +40°C
PRESSURE	≤400 Bar	≤400 Bar	≤400 Bar
SPEED	≤0.5 m/sec	≤0.5 m/sec	≤0.5m/sec

Note: The above data are maximum values and cannot be used at the same time.

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	ØD	≤0.4 µm	≤4 µm
Groove Base	Ød	≤1.6 µm	≤10 µm
Groove Flanks	B	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value.

INSTALLATION

Easily assembled on one-piece piston. It is very important that the assembly tools must be of soft material and have no sharp edges. Before installation the sealing element must be oiled with system oil.

NOTES

It is recommend choosing suitable material and quantity for guiding element regarding the purpose of application.

PERMISSIBLE SEALING GAP

B (mm)	Smax (mm)		
	150 Bar	250 Bar	400 Bar
3.2	0.30	0.20	
4.2	0.40	0.30	
6.3	0.50	0.40	0.25
8.1	0.60	0.50	0.35

Note: The largest sealing gap value occurring on the non-pressurized side of the seal does have a vital importance for the function of the seal and in this respect it is quite important to use the S value lower than the above indicated numbers.

K64 PNEUMATIC ROD SEAL

K64 is a single acting pneumatic rod seal ensuring that foreign particles are not introduced into the pneumatic cylinders. The lip is designed in a particular way that it functions as a rod seal and wiper.

PRODUCT ADVANTAGES

- Superior sealing effect
- Superior wiping effect
- Low dynamic friction
- Minimal space requirement
- Highly wear resistant

APPLICATION

Compact and special small cylinders.

MATERIAL		CODE
PU	92 SHORE A	PU9201

OPERATING CONDITIONS	
MEDIA	Prepared, dried and de-oiled compressed air
TEMPERATURE	-30°C +80°C
PRESSURE	≤16 Bar
SPEED	≤1.0 m/sn

Note: The above data are maximum values and cannot be used at the same time.

SURFACE ROUGHNESS		Rmax
Sliding Surface	Ød	≤4.0 µm
Groove Base	ØD	≤10 µm
Groove Flanks	B	≤15 µm

INSTALLATION

It can be assembled into closed groove without any tools. K64 does not need additional element such as circlip for axial fitting within the housing. We recommend using special assembly tool. It is very important that the assembly tools must be of soft material and have no sharp edges. Before installation the sealing element must be oiled with system oil.

K93 is a single acting wiper ensuring that foreign particles are not introduced into the hydraulic system.

PRODUCT ADVANTAGES
- Very good wiping performance
- No twisting in the housing
- Easy installation
- Specially designed to prevent big particles to get into the system
- Used in heavy conditions by the good mechanical properties of Polyurethane material.

APPLICATION
Construction machinery, forklift-trucks, presses, injection moulding machines, agricultural machinery and standard cylinders.

MATERIAL		CODE
PU	92 SHORE A	PU9201

OPERATING CONDITIONS			
MEDIA	Mineral oils (DIN 51524)	HFA and HFB	HFC
TEMPERATURE	-30°C +100°C	+5°C +50°C	-30°C +40°C
SPEED	≤1.0 m/sec	≤1.0 m/sec	≤1.0 m/sec

Note: The above data are maximum values and cannot be used at the same time.

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	Ød	≤0.4 µm	≤3.2 µm
Sliding Surface	ØD	≤1.6 µm	≤10 µm
Groove Flanks	S1	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value

INSTALLATION
Easily installed to closed type groove. We recommend using special assembly tool (See section; Hydraulic Sealing Elements General Installation Information). It is very important that the assembly tools must be of soft material and have no sharp edges.

NOTES
For product, groove has to be designed with angle.

K94 WIPER

K94 is a single acting wiper ensuring that foreign particles are not introduced into the hydraulic system.

PRODUCT ADVANTAGES

- Very good wiping performance
- Simple, easy-construction groove
- No twisting in the housing
- Specially designed to prevent hydrodynamic pressure build-up
- Specially designed to provide excellent sealing against big particles, humidity and water
- Used in heavy conditions by the good mechanical properties of Polyurethane material

APPLICATION

Mining industry, heavy-duty , concrete pumps, mobile applications, telescopic cylinders.

MATERIAL		CODE
PU	94 SHORE A	PU9401

OPERATING CONDITIONS			
MEDIA	Mineral oils (DIN 51524)	HFA and HFB	HFC
TEMPERATURE	-40°C +120°C	+5°C +50°C	-30°C +40°C
SPEED	≤1.0 m/sec	≤1.0 m/sec	≤1.0 m/sec

Note: The above data are maximum values and cannot be used at the same time.

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	Ød	≤0.4 µm	≤3.2 µm
Groove Base	ØD	≤1.6 µm	≤10 µm
Groove Flanks	S1	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value.

INSTALLATION

Easily installed to closed type groove. We recommend using special assembly tool (See section; Hydraulic Sealing Elements General Installation Information). It is very important that the assembly tools must be of soft material and have no sharp edges.

NOTES

Groove has to be designed with suitable form according to K94.

K501 PISTON SEAL

K501 is a two piece double acting piston seal consisting of a thermoplastic sealing element and one energizer elastomer ring.

ADVANTAGES

- Excellent sealing performance under dynamic loading
- Simple groove design
- Easy fit without installation tool
- Superior sealing performance at high and variable pressure levels
- Longer service life due to high abrasion resistance
- Excellent sealing at high surface roughness
- Outstanding resistance to shock pressures

APPLICATION

Construction machinery ,heavy duty cylinders

MATERIAL		CODE
NBR	70 SHORE A	NB7001
PA		PA9904

OPERATING CONDITIONS			
MEDIA	Mineral oils (DIN 51524)	HFA and HFB	HFC
TEMPERATURE	-30°C +105°C	+5°C +60°C	-30°C +60°C
PRESSURE	≤500 Bar	≤500 Bar	≤500 Bar
SPEED	≤1 m/sec	≤1 m/sec	≤1 m/sec

Note: The above data are maximum values and cannot be used at the same time

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	ØD	≤0.4 µm	≤4.0 µm
Groove Base	Ød	≤1.6 µm	≤6.3 µm
Groove Flanks	B	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value.

INSTALLATION

Easy installation into one-piece piston head.
Sealing elements must be pre-lubed with system oil before installation.

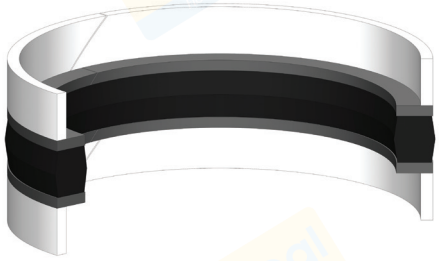
NOTES

It is recommended to use with minimum two piston guide rings in long-stroke cylinders, minimum one guide ring in short stroke and under low radial loads.

PERMISSIBLE SEALING GAP	
B (mm)	Smax (mm)
4.2	0.35
6.3	0.50
8.1	0.60

Note: All the above mentioned "S" values are maximum and it's vital to use lower values for system security.

K503 COMPACT SET



K503 is a five piece double acting compact seal which consists of one elastomeric nitrile rubber sealing element, two polyester elastomer back-up rings on both sides to prevent extrusion into the sealing gap and two special profiled guide rings produced from thermoplastic to absorb transverse forces.

PRODUCT ADVANTAGES

- Superior sealing performance
- Economic sealing and guiding solution
- Simple groove design, one-piece piston possible
- No need for extra guide rings with compact design
- Simple snap-fit installation

APPLICATION

Standard cylinders

MATERIAL		CODE
NBR	70 SHORE A	NB7001
POM		PM9901
TPE		TP7301

OPERATING CONDITIONS			
MEDIA	Mineral oils (DIN 51524)	HFA and HFB	HFC
TEMPERATURE	-30°C +105°C	+5°C +60°C	-30°C +60°C
PRESSURE	≤ 400 Bar	≤ 400 Bar	≤ 400 Bar
SPEED	≤ 0.5 m/sec	≤ 0.5 m/sec	≤ 0.5 m/sec

Note: The above data are maximum values and cannot be used at the same time.

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	ØD	≤0.4 µm	≤4 µm
Groove Base	Ød	≤1.6 µm	≤6.3 µm
Groove Flanks	B	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value.

INSTALLATION

Easily assembled into one-piece piston because the back-up rings and guide rings are produced in split forms. It is very important that the assembly tools must be of soft material and have no sharp edges. Before installation the sealing element must be oiled with system oil.

NOTES

For special applications that require high temperatures. piston seal is manufactured in FKM and PTFE material.

K518 is a five piece double acting compact seal which consists of one elastomeric nitrile rubber sealing element, two polyester elastomer back-up rings on both sides to prevent extrusion into the sealing gap and two special profiled guide rings produced from thermoplastic to absorb transverse forces.

PRODUCT ADVANTAGES

- Superior radial load bearing capacity
- Economic sealing and guiding solution
- Simple groove design, one-piece piston possible
- Long service life
- Simple snap installation

APPLICATION

Mobile hydraulics ,back-hoe loaders, fork-lift trucks, agricultural machinery, standard cylinders.

MATERIAL		CODE
NBR	80 SHORE A	NB8001
POM		PM9905
TPE		TP7301

OPERATING CONDITIONS			
MEDIA	Mineral oils (DIN 51524)	HFA and HFB	HFC
TEMPERATURE	-30°C +105°C	+5°C +60°C	-30°C +60°C
PRESSURE	≤400 Bar	≤400 Bar	≤400 Bar
SPEED	≤0.5 m/sn	≤0.5 m/sn	≤0.5 m/sn

Note: The above data are maximum values and cannot be used at the same time.

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	ØD	≤0.4 µm	≤4.0 µm
Groove Base	Ød	≤1.6 µm	≤6.3 µm
Groove Flanks	B	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value.

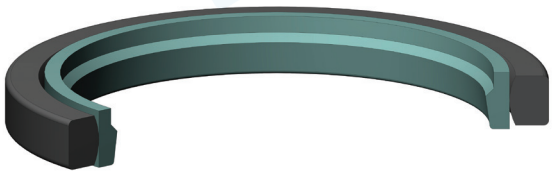
INSTALLATION

Easily assembled into one-piece piston because the back-up rings and guide rings are produced in split forms. It is very important that the assembly tools must be of soft material and have no sharp edges. Before installation the sealing element must be oiled with system oil.

NOTES

For special applications that require high temperatures, piston seal is manufactured in FKM and PTFE material.

K704 ROD SEAL



K704 is a two piece single acting rod seal which consists of one special mixture PTFE profile ring and a NBR elastomer ring as energizing element.

PRODUCT ADVANTAGES

- Low friction, free of stick-slip
- Long service life
- High sliding speed
- Wide range of temperature and chemicals depending on the energizer material
- Minimum static and dynamic friction coefficient for minimum energy loss
- Simple groove design and low axial housing heights

APPLICATION

Steel industry, injection moulding machines, presses, large diameter cylinders

MATERIAL		CODE
PTFE		PT6003
NBR	80 SHORE A	NB8001

OPERATING CONDITIONS			
MEDIA	Mineral oils (DIN 51524)	HFA ve HFB	HFC
TEMPERATURE	-30°C +105°C	+5°C +60°C	-30°C +60°C
PRESSURE	≤400 Bar	≤400 Bar	≤400 Bar
SPEED	≤5 m/sec	≤5 m/sec	≤5 m/sec

Note: The above data are maximum values and cannot be used at the same time.

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	Ød	≤0.2 µm	≤2.0 µm
Groove Base	ØD	≤1.6 µm	≤6.3 µm
Groove Flanks	B	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value.

INSTALLATION

We recommend using special assembly tool (See section; Hydraulic Sealing Elements General Installation Information). It is very important that the assembly tools must be of soft material and have no sharp edges. Before installation the sealing element must be oiled with system oil.

NOTES

For HFA HFB HFC used applications, special filled PTFE materials are recommended.Resistance in low temperature and high temperature applications can be improved by alternate elastomer compounds.

PERMISSIBLE SEALING GAP

B (mm)	Smax (mm)		
	150 Bar	250 Bar	400 Bar
10	0,60	0,50	0,40
12,5	0,65	0,55	0,45
15	0,70	0,60	0,50
17,5	0,75	0,65	0,55
20	0,80	0,70	0,55

Note: All the above mentioned "S" values are maximum and it's vital to use lower values for system security.

K705 WIPER

K705 is a three piece single acting wiper which consists of one special mixture PTFE profile ring and two o-rings as energizers. K705 ensures that foreign particles are not introduced into the hydraulic systems, avoiding wear and damage to all the internal components including seals.

PRODUCT ADVANTAGES

- Low friction
- Free of stick-slip
- High sliding speed
- Wide range of temperature and chemicals depending on the elastomer material

APPLICATION

Mobile hydraulics, aluminium injection machines and industrial machinery, control and regulation equipment

MATERIAL		CODE
PTFE		PT6003
NBR	70 SHORE A	NB7001

OPERATING CONDITIONS	
MEDIA	Mineral oils (DIN 51524)
TEMPERATURE	-30°C +105°C
HIZ	≤ 5 m/sec

Note: The above data are maximum values and cannot be used at the same time. For HFA HFB HFC used applications, special filled PTFE materials are recommended .Resistance in low temperature and high temperature applications can be improved by alternate elastomer compounds.

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	Ød	≤0.2 µm	≤2.0 µm
Groove Base	ØD	≤1.6 µm	≤6.3 µm
Groove Flanks	B	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value.

INSTALLATION

We recommend using special assembly tool (See section; Hydraulic Sealing Elements General Installation Information). It is very important that the assembly tools must be of soft material and have no sharp edges. Before installation the sealing element must be oiled with system oil.

NOTES

K705 wipers have to be used with K35 or K704 rod seals to prevent hydrodynamic pressure build up. If that is not possible some precautions have to be taken to prevent hydrodynamic pressure between wiper and seal (see section: Hydraulic Sealing Elements – Sample Designs). At high temperature working conditions FKM energizing O-ring and special mixture PTFE ring are able to be manufactured according to costumer's request.

K755 PISTON SEAL

K755 is a two piece double acting piston seal which consists of one energizing elastomer ring and special mixture thermoplastic ring.

PRODUCT ADVANTAGES

- Low friction, free of stick-slip
- Excellent performance in large diameter cylinders and heavy duty applications
- Long service life
- High sliding speed
- Wide range of temperature and chemicals depending on the o-ring material
- Minimum static and dynamic friction coefficient for a minimum energy loss
- Simple groove design and low axial housing heights
- No twisting in the housing

APPLICATION

Steel industry, injection moulding machines, presses, large diameter cylinders, steel industry.

MATERIAL		CODE
PTFE		PT6003
NBR	80 SHORE A	NB8001

OPERATING CONDITIONS	
MEDIA	Mineral oils (DIN 51524)
TEMPERATURE	-30°C +105°C
PRESSURE	≤400 Bar
PEED	≤ 5 m/sec

Note: The above data are maximum values and cannot be used at the same time. For HFA HFB HFC used applications, special filled PTFE materials are recommended .Resistance in low temperature and high temperature applications can be improved by alternate elastomer compounds.

SURFACE ROUGHNESS		Ra	Rmax
Sliding Surface	ØD	≤0.2 µm	≤2.0 µm
Groove Base	Ød	≤1.6 µm	≤6.3 µm
Groove Flanks	B	≤3.2 µm	≤16 µm

Note: It is recommended to have 50% to 90% of the working surface material contact area value.

INSTALLATION

We recommend using special assembly tool (See section; Hydraulic Sealing Elements General Installation Information). It is very important that the assembly tools must be of soft material and have no sharp edges. Before installation the sealing element must be oiled with system oil.

NOTES

For special applications that require high temperatures, rod seal is manufactured in FKM and PTFE material.

PERMISSIBLE SEALING GAP

B (mm)	Smax (mm)		
	150 Bar	250 Bar	400 Bar
10	0,60	0,50	0,40
12,5	0,65	0,55	0,45
15	0,70	0,60	0,50
17,5	0,75	0,65	0,55
20	0,80	0,70	0,55

Note: All the above mentioned "S" values are maximum and it's vital to use lower values for system security.