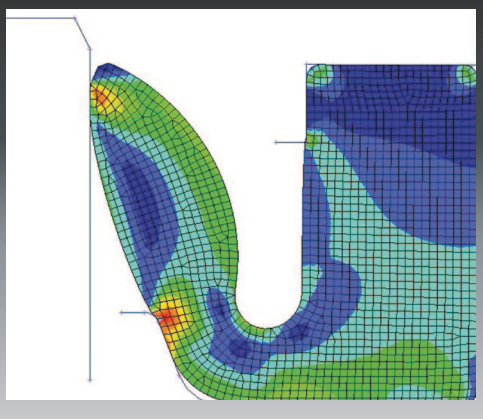
ROTARY SEALS

Perobat Jumbo

BEHAVIOR FINALE ELEMENT ANALYSIS



DESCRIPTION

The Jumbo seal was developed to answer applications requiring a low-pressure sealing associated with slow rotary movements.

This jumbo seal is composed of:

- A heel which keeps the seal in position in its housing while ensuring static sealing;
- A floating lip, intended to ensure dynamic sealing.

MATERIAL

Depending on the application, the used material is:

- Nitrile elastomer NBR or Self-lubricated Nitrile
- Hydrogenated Nitrile elastomer HNBR.

PERFORMANCE

- Good resistance to traction, tearing and abrasion.
- Simple effect sealing insured at low pressure (<5 bars)
- Seal manufactured without junction, with the same characteristics all around (for an established section, our process gives the possibility to manufacture seals in a wide range of diameter.)
- Easy assembling and dismantling
- Seal tight in its groove to insure a good static sealing
- It is possible to mount the Jumbo seal without dismantling the equipment (by gluing with a template and a procedure, contact us)

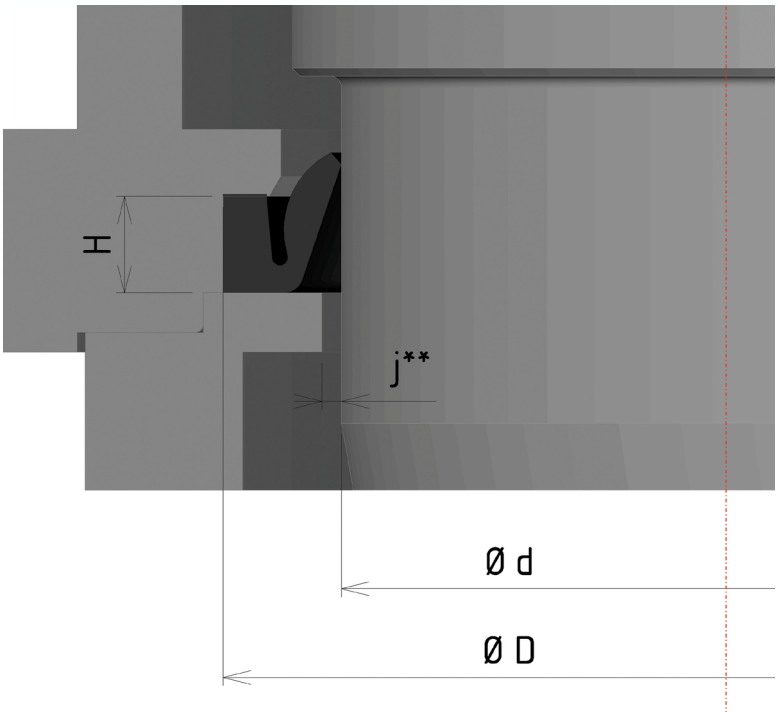
MAIN APPLICATIONS

Large bearings (Wind turbines, tidal turbines…), tunnel boring

ECHNICAL CHARACTERISTICS

Materials	Pressure	Speed	Temperature	Environment
	BAR	m/s	°C	
NBR NBR Autolub	< 5	< 2	-30 to +110°	Dam water Mineral / Synthetic oil Grease
HNBR	< 5	< 2	-40 to +150°	Dam water Mineral / Synthetic oil Grease

HOUSING QUALITY



JUMBO seal is mounted tight in its groove, this to guarantee sealing on all faces:

- Radially on the assembly diameter (generally the outside diameter).
- Axially by heel compression ensured by retaining plate mounting..

	Tolerance*	Surface finish (Ra)
	mm	µm
Sliding diameter d	f8	0.4 to 0.8
Outer diameter D	H8	0.8 to 1.6
Axial height of housing H	0 / + 0.2	0.8 to 1.6
Hardness or rod surface or cylinder surface (Rockwell C)	> 30 HRC	

Ø of Sliding (d)*	Ø Outside of groove (D)*	Height (H)*	Eccentricity*
< 1500	d + 25	8.5	< 1mm
< 2500	d + 50	22	< 2mm
< 3500	d + 64	24.5	< 3mm
> 3500	d + 84	33	< 4mm

** Values given for information purposes. These can be seen again according to your exact service conditions. Do not hesitate consulting us.*

***Extrusion gap to be defined according to your exact input data.*

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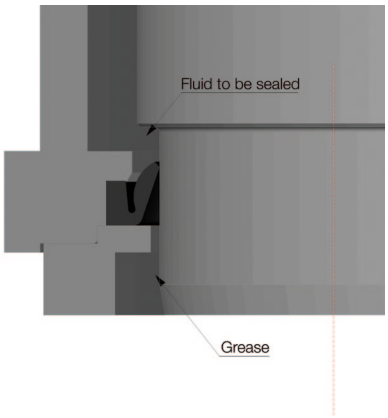
VARIOUS TYPES OF USE

JUMBO seals are adapted to several mounting types:

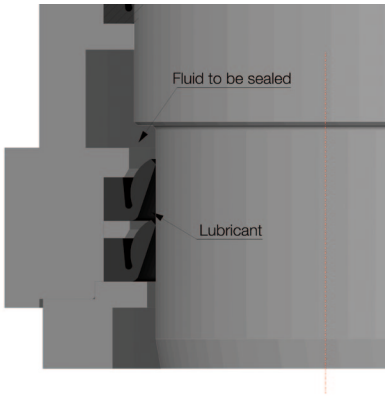
A) Sealing in one direction:

1/ One seal mounting



Jumbo seal mounting with the lip facing the fluid to be sealed. This type of mounting is suitable in a minor polluted environment only.

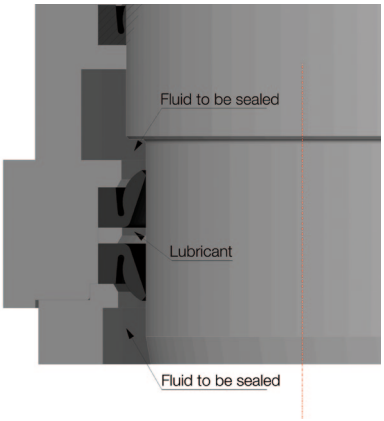
2/ Two seals assembled in “tandem”



“Tandem” assembly of two Jumbo seals. This mounting gives several advantages. Indeed, with lubricant injection in the area between the two seals, we create an intermediate pressure room allowing to compensate the pressure gap between both seal faces. That permits to optimize functioning.

This “tandem” assembly also allows to insure a double sealing and solve the damage case of one of the two seals.

B) Sealing in two opposite directions:



“Back to back“ mounting of two Jumbo seals insuring a double effect sealing. This type of mounting is adapted in case of two different fluids being sealed.

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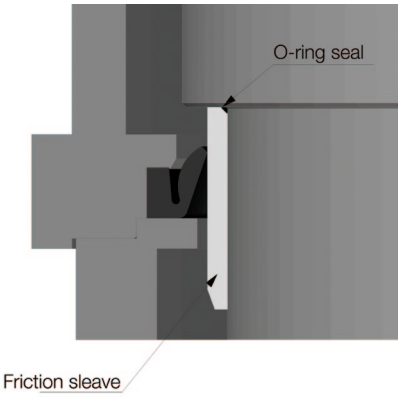
Replacement

With each machine revision service, we recommend to replace the Jumbo seal and to check sliding surface state.

To avoid necessary shaft replacement, we recommend two solutions.

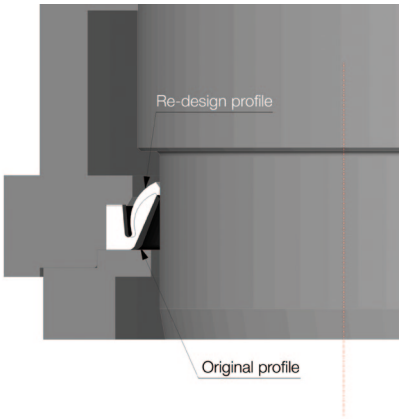
1) The use of interchangeable friction sleeve:



This solution allows a high hardness and a very good surface finish. The disadvantage to this solution is that you will need more space for this installation than for a usual mounting.

A O-Ring seal is needed for the sealing of the friction sleeve on its inner diameter.

2) The use of a « new » seal profile :

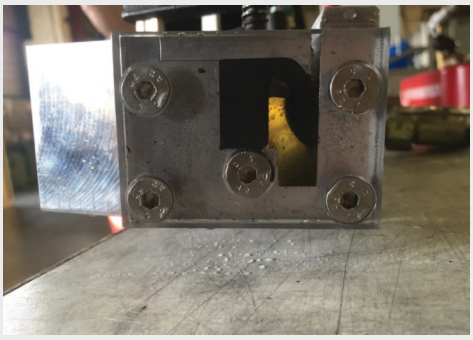


To answer to sliding surface deterioration problem, PXL Seals can also design a new seal profile with a more hurt lip, allowing contact in other areas.

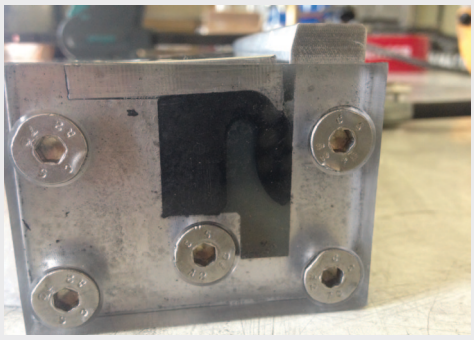
This solution is recommended only if inability to realize the previous one. In fact, the solution requires the development of a new seal profile and thus the manufacturing of another mold.

Tests realized by PXL Seals

As part of a specific project realized in collaboration with a customer, statics tests in pressure were realized by PXL Seals. For information, by using a maintaining ring “profiled” according to seal design (photos below), the profile was positively tested in statics with a pressure of 10 bars.



Under pressure test (water)



Under pressure test (grease)

Feel free to contact us for any specific requests.

Systèmes d’étanchéité
pour la production d’énergie

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