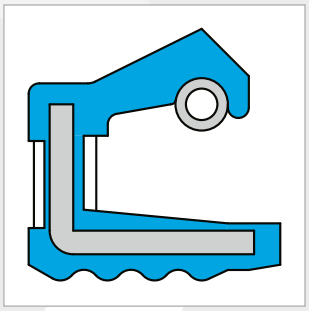


INVERTED SHAFT SEALS
OSCW

DESCRIPTION

The OSCW profile is an inverted shaft seal composed of a single metal cage with rubber grooves on the outside of the cage and a primary sealing lip with an integrated spring.

ADVANTAGES

Very good static sealing

Very good thermal expansion compensation

Greater roughness is allowed in the housing

Reduced risk of corrosion

Easy to assemble with very limited bounce-back effect

Sealing for low and high viscosity fluids

Modern primary sealing lip with low radial forces

Suitable for rotating hubs with a fixed shaft

APPLICATIONS

All types of rotative applications

Rotating hubs

Fixed shafts

MATERIALS

Rubber

ACM 70 - 75 Shore A

EPDM 70 - 75 Shore A

FKM 70 - 75 Shore A

HNBR 70 - 75 Shore A

NBR 70 - 75 Shore A

Metal cage

Steel - AISI 1010

Spring

Steel - AISI 1070 - 1090

Stainless steel - AISI 316

SEAL DESIGN

Tolerance for the inside diameter of the seal (Ød)

Shaft diameter Ød1 (mm)	Apparent metal cage	Rubber coating	Coating with grooves
Ød1 ≤ 50.0	-0.20 / -0.10	-0.30 / -0.15	-0.40 / -0.20
50.0 < Ød1 ≤ 80.0	-0.23 / -0.13	-0.35 / -0.20	-0.45 / -0.25
80.0 < Ød1 ≤ 120.0	-0.25 / -0.15	-0.35 / -0.20	-0.45 / -0.25
120.0 < Ød1 ≤ 180.0	-0.28 / -0.18	-0.45 / -0.25	-0.55 / -0.30
180.0 < Ød1 ≤ 300.0	-0.30 / -0.20	-0.45 / -0.25	-0.55 / -0.30
300.0 < Ød1 ≤ 500.0	-0.35 / -0.23	-0.55 / -0.30	-0.65 / -0.35

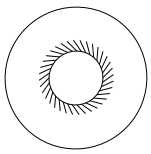
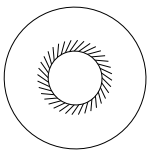
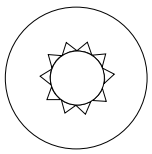
Roundness tolerance

Shaft diameter Ød1 (mm)	Apparent metal cage	Rubber coating
Ød1 ≤ 50.0	0.18	0.25
50.0 < Ød1 ≤ 80.0	0.25	0.35
80.0 < Ød1 ≤ 120.0	0.30	0.50
120.0 < Ød1 ≤ 180.0	0.40	0.65
180.0 < Ød1 ≤ 300.0	0.25% of the inside diameter	0.80
300.0 < Ød1 ≤ 500.0	0.25% of the inside diameter	1.00

Tolerance for the outside diameter of the seal (ØD)

Free and without constraint, the outside diameter of the sealing lip is always bigger than the diameter of the rotating hub. The pre-tightening or interference denotes the difference between these two values. Depending on the hub diameter, the diameter of the sealing lip is generally considered to be greater, between 0.8 and 3.5 mm.

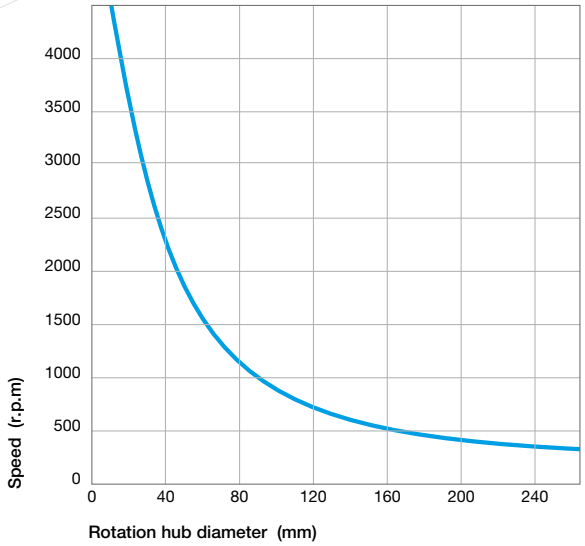
Pumping leads

Clockwise	Anti-clockwise	Bi-directional
		
R	L	H0

Other types of pumping leads can be created according to your specifications. Please contact our experts.

TECHNICAL DATA

Speed



Linear speed calculation:

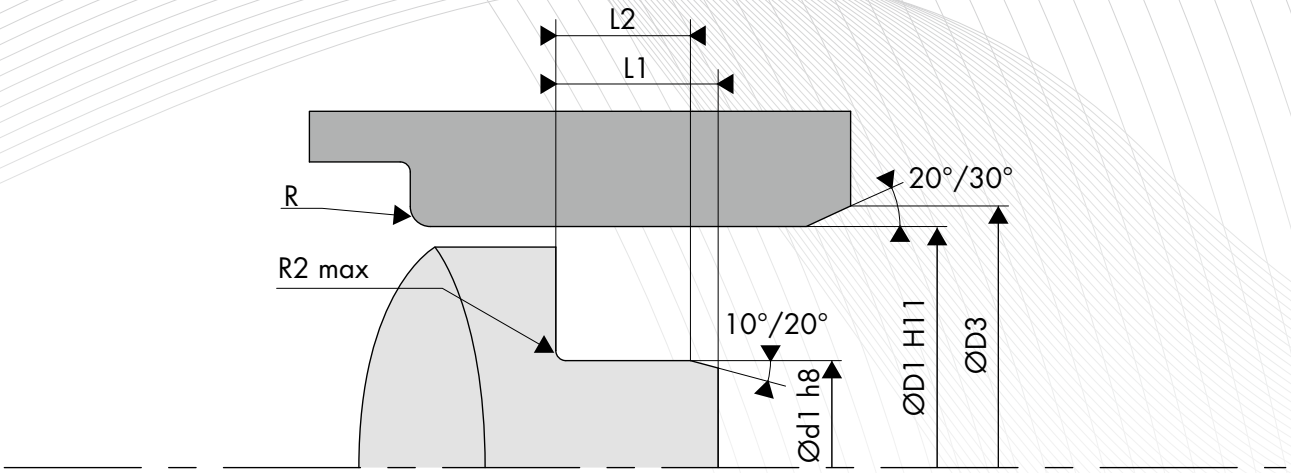
$$s\ (m/s) = \frac{[\text{rotating hub } Ø\ (mm)\ \times\ \text{speed (rpm)}\ \times\ \pi]}{60{,}000}$$

Pressure

The inverted shaft seals are generally used in unpressurised environments, or for pressures between 0.02 and 0.05 MPa (maximum).

Temperature / Media

Media		Maximum temperature depending on the materials						
		ACM	AEM	EPDM	FKM	HNBR	NBR	VMQ
Mineral oils	Oils for motors	+130°C	+130°C	–	+170°C	+130°C	+100°C	+150°C
	Oils for gearboxes	+120°C	+130°C	–	+150°C	+110°C	+80°C	+130°C
	Oils for hypoid gears	+120°C	+130°C	–	+150°C	+110°C	+80°C	–
	ATF oils	+120°C	+130°C	–	+170°C	+130°C	+100°C	–
	Hydraulic oils	+120°C	+130°C	–	+150°C	+130°C	+90°C	–
	Greases	–	+130°C	–	–	+100°C	+90°C	–
Fire-resistant fluids	HFA group - Emulsion with more than 80% water	–	–	–	–	+70°C	+70°C	+60°C
	HFB group - Opposite solution (water in oil)	–	–	–	–	+70°C	+70°C	+60°C
	HFC group - Polymer aqueous solution	–	–	+60°C	–	+70°C	+70°C	–
	HFD group - Water-free synthetic fluids	–	–	–	+150°C	–	–	–
Other fluids	EL + L heating oil	–	–	–	–	+100°C	+90°C	–
	Air	+150°C	+150°C	+150°C	+200°C	+130°C	+100°C	+200°C
	Water	–	–	+150°C	+100°C	+100°C	+90°C	–
	Water for washing	–	–	130°C	100°C	100°C	90°C	–
Temperature range	Min.	-25°C	-40°C	-45°C	-20°C	-30°C	-30°C	-60°C
	Max.	+150°C	+150°C	+150°C	+200°C	+150°C	+100°C	+200°C



FIXED SHAFT DESIGN

Surface roughness

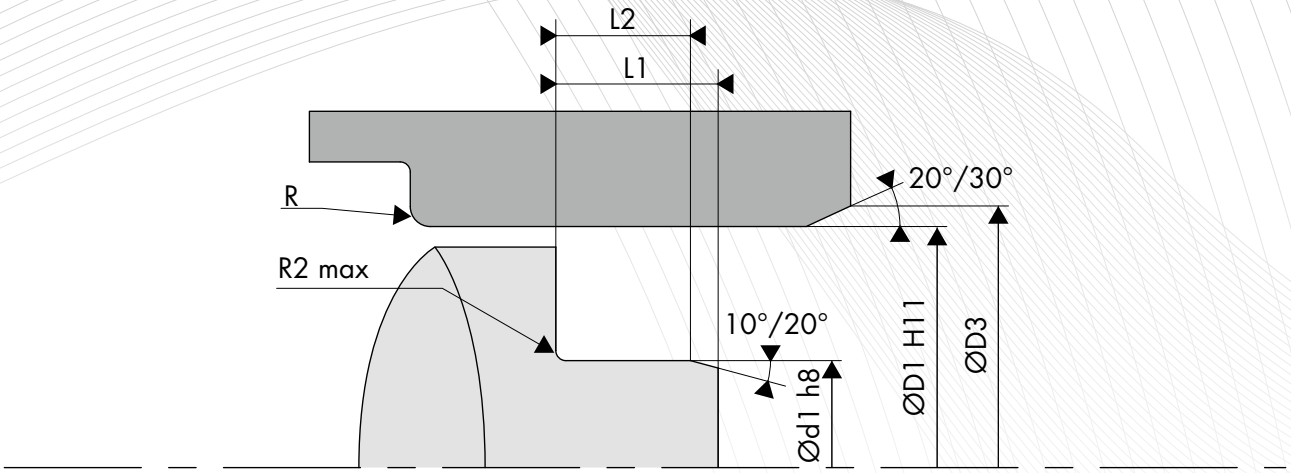
Ra	1.6 to 6.3 µm
Rz	10.0 to 25.0 µm
Rmax	≤25.0 µm

Fixed shaft tolerance

Shaft diameter Ød1 (mm)	Tolerance h8 (mm)
3.0 < Ød1 ≤ 6.0	-0.018 / 0
6.0 < Ød1 ≤ 10.0	-0.022 / 0
10.0 < Ød1 ≤ 18.0	-0.027 / 0
18.0 < Ød1 ≤ 30.0	-0.033 / 0
30.0 < Ød1 ≤ 50.0	-0.039 / 0
50.0 < Ød1 ≤ 80.0	-0.046 / 0
80.0 < Ød1 ≤ 120.0	-0.054 / 0
120.0 < Ød1 ≤ 180.0	-0.063 / 0
180.0 < Ød1 ≤ 250.0	-0.072 / 0
250.0 < Ød1 ≤ 315.0	-0.081 / 0
315.0 < Ød1 ≤ 400.0	-0.089 / 0
400.0 < Ød1 ≤ 500.0	-0.097 / 0

Fixed shaft radius and width

Height H1 (mm)	Width		Radius R2 max (mm)
	L2min (H1 x 0.85)	L1min (H1 x +0.3)	
7.00	5.95	7.30	0.50
8.00	6.80	8.30	
10.00	8.50	10.30	
12.00	10.30	12.30	0.70
15.00	12.75	15.30	
20.00	17.00	20.30	



ROTATING HUB DESIGN

Rotating hub hardness

Rotation speed	Hardness in HRC
s ≤ 4.0 m/sec	45 HRC
4.0 < s ≤ 10.0 m/s	55 HRC
s > 10.0 m/sec	60 HRC

Surface roughness

Ra *	0.2 to 0.8 µm
Rz	1.0 to 4.0 µm
Rmax	≤6.3 µm

*Ra = 0.1 µm for demanding applications

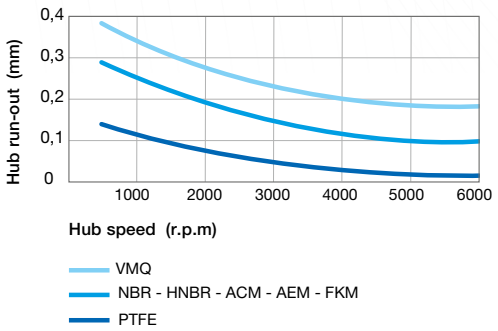
Rotating hub tolerance

Rotating hub diameter ØD1 (mm)	Tolerance H11 (mm)
ØD1 ≤ 3.0	0 / +0.060
3.0 < ØD1 ≤ 6.0	0 / +0.075
6.0 < ØD1 ≤ 10.0	0 / +0.090
10.0 < ØD1 ≤ 18.0	0 / +0.110
18.0 < ØD1 ≤ 30.0	0 / +0.130
30.0 < ØD1 ≤ 50.0	0 / +0.160
50.0 < ØD1 ≤ 80.0	0 / +0.190
80.0 < ØD1 ≤ 120.0	0 / +0.220
120.0 < ØD1 ≤ 180.0	0 / +0.250
180.0 < ØD1 ≤ 250.0	0 / +0.290
250.0 < ØD1 ≤ 315.0	0 / +0.320
315.0 < ØD1 ≤ 400.0	0 / +0.360
400.0 < ØD1 ≤ 500.0	0 / +0.400

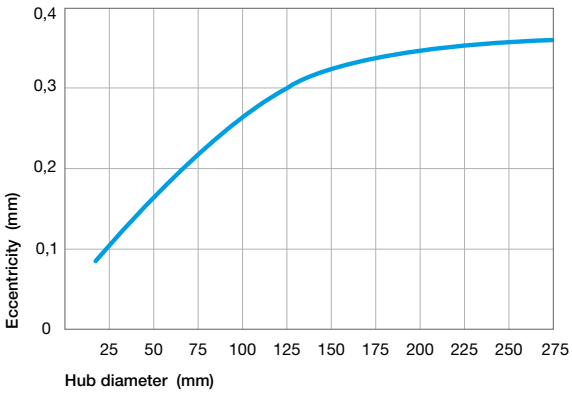
Chamfer and radius

Rotating hub diameter ØD1 (mm)	Chamfer diameter ØD3 (mm)	Radius R (mm)
ØD1 ≤ 10.0	ØD1 + 1.50	2.00
10.0 < ØD1 ≤ 20.0	ØD1 + 2.00	2.00
20.0 < ØD1 ≤ 30.0	ØD1 + 2.50	3.00
30.0 < ØD1 ≤ 40.0	ØD1 + 3.00	3.00
40.0 < ØD1 ≤ 50.0	ØD1 + 3.50	4.00
50.0 < ØD1 ≤ 70.0	ØD1 + 4.00	4.00
70.0 < ØD1 ≤ 95.0	ØD1 + 4.50	5.00
95.0 < ØD1 ≤ 130.0	ØD1 + 5.50	6.00
130.0 < ØD1 ≤ 240.0	ØD1 + 7.00	8.00
240.0 < ØD1 ≤ 500.0	ØD1 + 11.00	12.00

Rotating hub run out



Eccentricity



FRANCE JOINT SAS Zone Artisanale Le Mortier - B.P. 50009 - Cugand - 85613 Montaigu Cedex - France
Ph. **+33 (0)2 51 42 13 76** - Fax **+33 (0)2 51 43 61 14 -** Email: contact@francejoint.fr - Website: **www.francejoint.com**

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