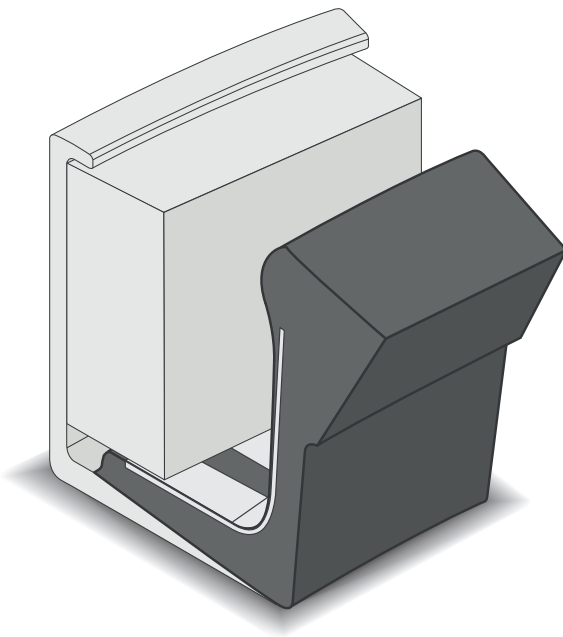




ROTARY SHAFT OIL SEALS AND CUSTOM MADE ARTICLES IN ELASTOMER AND RUBBER-TO-METAL

Rev. 01 03-11-2016

OIL SEALS TYPE L1M



- These shaft oil seals are similar to the L2M® type, and have been developed for small diameter cylinders, starting from 100 mm. For smaller diameters, please contact us to evaluate our production capacity.
- Made with a strong external metal casing ground according to FP's internal specification, onto which is vulcanized the sealing element. Available in various elastomers.
- The presence of a forged steel ring bound to the external metal casing, and a finger spring in stainless steel vulcanized with the sealing lip ensure the correct sealing performance, even when shock loads arise.
- This oil seal is recommended for applications with grease and low speeds.
- An additional dust lip is available upon request.

Applications

General industry, Heavy-duty industry, Mining industry, Primary metals industry

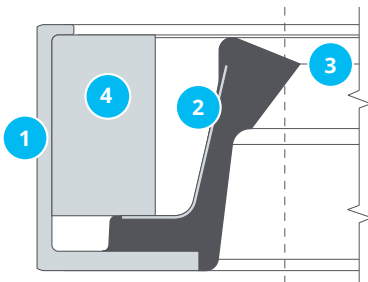
Working speed: up to 25 m/s

Pressure: up to 0.5 BAR

Operating temperature range: - 40°C / + 220°C

Remarks: All working parameters vary, considering the different type of materials and elastomer used.

L1M



Technical features

- 1 Metal outer casing with ground surface
- 2 Vulcanized finger spring
- 3 Mould made sealing lip
- 4 Stiffening ring

Materials

- 1 Metal casing:
Fe-DC04; AISI 304
- 2 Finger spring:
AISI 301
- 3 Elastomer:
NBR; FKM; VMQ; HNBR
- 4 Stiffening ring:
Fe 37

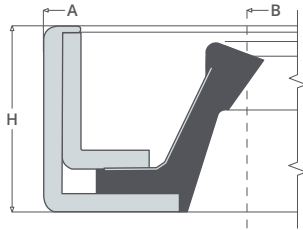
For further information on all our seals, please check our web page or contact our offices.

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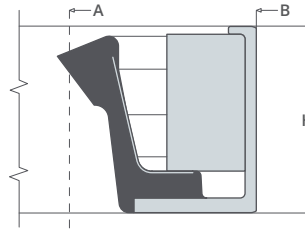
via Marconi 142/144, 24060 Castelli Calepio (BG) ITALY
☎ +39 035 442 5511 | 📠 +39 035 442 5478 | ✉ info@fpparis.com

L1M TYPES



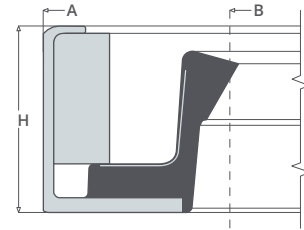
L1ML

Similar to the L1M but with a reversed metal insert. This solution has been engineered for rings with a narrow housing which does not allow the presence of the stiffening ring.



L1M-TE

External lip oil seal. Only available in self-lubricating FKM compound.



L1M-BP

Oil seal made to withstand pressures from 0.5 up to 1 BAR. Special profiles can be made to withstand higher pressures.

All the profiles are also available with dust lip "P"

TECHNICAL SPECIFICATIONS

Shaft and housing tolerances for metric (mm) and imperial sizes (inch.)

Shaft Ø (mm)	≤ 100	± 0.080
	101 ÷ 150	± 0.100
	151 ÷ 250	± 0.130
	≥ 250	± 0.250

Housing Ø (mm)	≤ 76	± 0.025
	77 ÷ 150	± 0.040
	151 ÷ 255	± 0.050
	256 ÷ 510	+ 0.05 / -0.10
	511 ÷ 1015	+ 0.05 / -0.15
	≥ 1015	+ 0.05 / -0.25

Shaft Ø (mm)	Chamfer "F" (mm)
≤ 250	7.00
> 250	12.00

TECHNICAL FEATURES FOR L1M

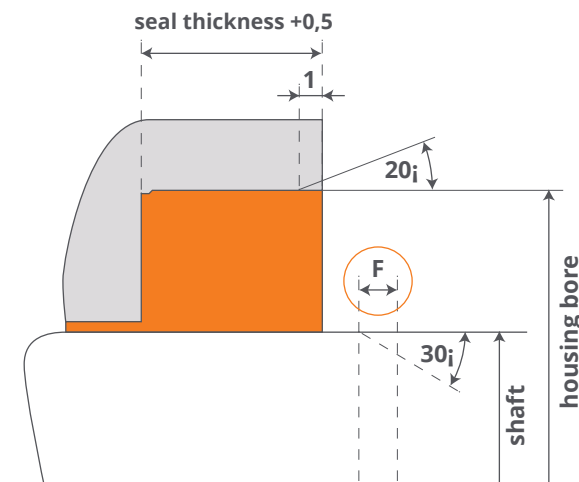


Tolerances on shaft and housing for metric (mm) and imperial (inch.)

Shaft size	≤ 100	± 0.080
Ø (mm)	101 ÷ 150	± 0.100
	151 ÷ 250	± 0.130
	≥ 250	± 0.250
	Housing	≤ 76
Ø (mm)	77 ÷ 150	± 0.040
	151 ÷ 255	± 0.050
	256 ÷ 510	+ 0.05 / -0.10
	511 ÷ 1015	+ 0.05 / -0.15
	≥ 1015	+ 0.05 / -0.15

Maximum misalignment allowed 2,5 mm

Shaft Ø (mm)	Chamfer "F" (mm)
≤ 250	7.00
> 250	12.00



"We recommend the use of a conical mounting tool for the installation of the seal"

Finishing of the shaft

A surface finishing of the cylinders done with chromium carbide has shown excellent results. Finishes made with chromium oxides have the disadvantage of reducing the heat dissipation capacity through the cylinder and should not be used with high-speed installations (<10 m/s). It is recommended to apply sleeves on the cylinders in the sealing areas of the ring and finished with hardness 58-62 HRC.

Shaft hardness and surface finishing

Speed (m/s)	Maximum roughness		Hardness
	Ra (mm)	Rmax (mm)	HRC
≤ 10	0.5-0.6	2.0-3.0	30
11 ÷ 16	0.3-0.5	1.0-2.0	40
> 16	0.2-0.3	0.8-1.0	50

Selecting the sealing elastomers

Elastomers	Applications
Nitrile NBR	Lubricating oils, hydraulic oils and mineral fats, water, HFA and HFB fluids, caustic cleaners.
Hydrogenated Nitrile HNBR	Lubricating oils, hydraulic oils and mineral fats, water, HFA and HFB fluids, caustic cleaners. It guarantees an excellent resistance to abrasion and a good thermal behavior.
Fluoroelastomer FKM	Mineral based liquids and fats, HFA, HFB, HFC and HFD fluids, water, chemicals and solutions. Not applicable with highly flammable liquids based on phosphoric acid. Recommended for use with flammable oils.
Silicon VQM	Organic oils and oils with high aniline content. Engine and gearbox oil. Excellent characteristics for mineral oils and fats. It can be used with aliphatic and aromatic hydrocarbons. This material is resistant to high and low temperatures.

Description		NBR	FKM	VQM	HNBR
Working temperature	C (± 2)	-20 ÷ +100	-20 ÷ +220	-60 ÷ +180	-40+150
Standard Hardness	Shore A (± 5)	70	70	70	70
Maximum working speed	m/s	12	25 ÷ 35	25	15

The above data has been obtained through tests that •FP• considers to be reliable. •FP• does not guarantee that the same results will be replicated in other laboratories with different preparation conditions and laboratory sample evaluation. For more details, please contact our technical office.

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fpparis.com

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