

TR/7/M/PTV

The TR/7/M/PTV – same as the TR/7 – seal is a rotary shaft seal developed to cope with pressures up to 5 bar at about 4 m/s circumferential speed without any shaft misalignment.



The special design allows lightening the radial lip force under pressure and consequently reduce friction.

The TR/7/M/PTV differs from TR/7 by the presence of a flexible metal rather than a textile back. The use of a retainer plate as advisable due to the potential pressure in the system.

The TR/7/M/PTV has a good flexibility and is easier to install compared to seals with rigid metal cases. It also has the advantage of extremely low shrinkage under temperature and ambient humidity.

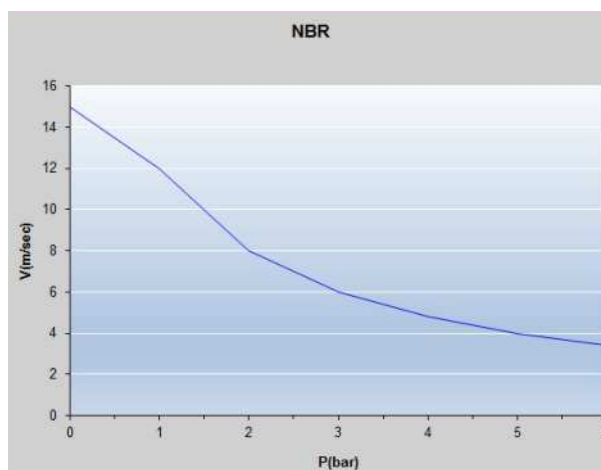
The TR/7/M/PTV seal is characterized by an exclusive antifriction band patented with number PCT/EP2006/004962.

Exclusive features of TR/7/M/PTV seals are:

- Antifriction material vulcanized during the process according to patent PCT/EP2006/004962
- Reduction of radial lip force under pressure
- Significantly reduced friction and consequent temperature decrease
- Absence of external metallic parts and consequent prevention of damages to housing bore
- No metal case and consequently no scratching of housing bore

Possible size range for TR/7/M/PTV seals:
 $\varnothing d_{\min} = 100 \text{ mm}$; $\varnothing D_{\max} = 2\,350 \text{ mm}$ (please also see the drawing at the next page).

The chart at the right-hand side shows the pressure over circumferential shaft speed valid for NBR elastomer without the PTV-layer. Please contact the TENUTE Technical Department / SKF Seals Application Engineering for further details.



Materials

The TR/7/M/PTV standard material is NBR (nitril rubber) filled with PTFE, but for particular working conditions seals can be produced also in HNBR (hydrogenated nitril rubber), VMQ (silicone rubber) and FKM (fluorocarbon rubber) materials. Other combinations are available upon request.

The table below shows working temperature ranges (minimum, maximum, peak (*)) applicable to each type of compound.

Material	Temperature		Standard spring
	min	max	
	°C	°C (*)	
NBR	-30	+100 (+120)	Carbon steel
HNBR	-40	+150 (+175)	Carbon steel
VMQ	-50	+200 (+250)	Carbon steel
FKM	-20	+200 (+250)	AISI 302

The PTFE compounds used for the TR/7/M/PTV coating design may vary depending on the applications demand. The table below shows the most used ones with the relative coefficients of friction. For more details, please contact the TENUITE Technical Department / SKF Seals Application Engineering.

Material	Coefficient of friction
PTFE Virgin	0,06
PTV / MoS ₂ (1*)	0,08
PG (2*)	0,11
PB (3*)	0,13
PB / MoS ₂ (4*)	0,13

1* ... PTFE with glass and molybdenum bisulfide

2* ... PTFE with carbon and graphite

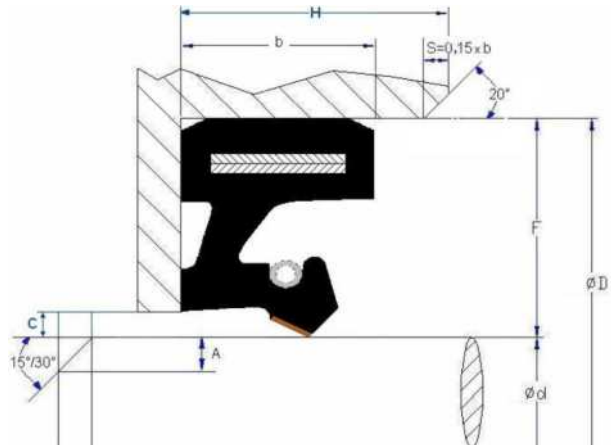
3* ... PTFE with bronze

4* ... PTFE with bronze and molybdenum bisulfide

Assembly of TR/7/M/PTV seals

The drawing shows the details of the housing dimensions and the assembly of the TR/7/M/PTV seal.

Particular applications or requirements different from those details shall be agreed with the TENUITE Technical Department / SKF Seals Application Engineering.



C_{maximum} ... see table below

Clearance

Shaft diameter Ød		Clearance C
Over	Up to	max
mm	mm	mm
25	600	1
600	2 420	1,5

Shaft and housing diameter tolerance

Shaft diameter $\varnothing d$		Tolerance	Housing diameter $\varnothing D$		Tolerance
Over	Up to		Over	Up to	
mm	mm		mm	mm	
100	1 000	h11	30	1 000	H8
1 000	2 290	h10	1 000	2 350	+0,2 / 0

Housing height tolerance and chamfers

Housing height			Shaft chamfer			Housing chamfer
b	H	Tolerance	$\varnothing d$		A minimum	S
mm	mm	mm	Over mm	Up to mm	mm	
Up to 10	b + 0,3	+0,2 / 0	100	250	3	S = 0,15 x b
Over 10	b + 0,4	+0,3 / 0	250	800	4,5	
			800	1 500	6	
			1 500	2 290	7,5	

Shaft and housing surface finishing

A roughness of Ra from 0,2 to 0,6 μm is recommended for the shaft in standard applications, while in case of high speeds, a finishing to Ra from 0,2 to 0,4 μm is recommended. Plunge grinding is required. For the housing bore a finish turning is sufficient.

Shaft hardness

Up to 15 m/s	Over 15 m/s
40 HRC	60 HRC and above
PTFE PG (2*)	PTFE PB (3*)

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