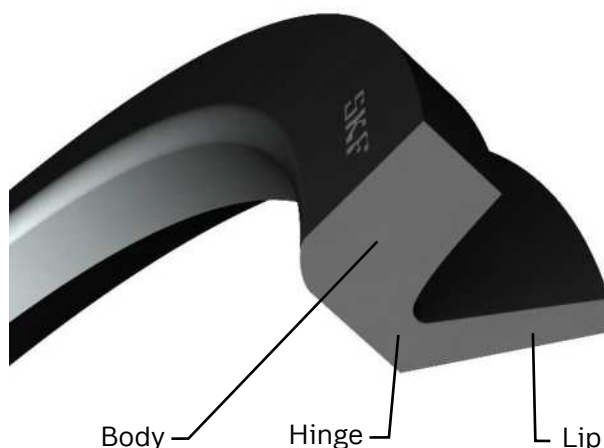


TR/VL

The TR/VL seal is a very flexible axial shaft seal with a very narrow cross section developed based on SKF / TENUTE experience over the years to properly operate in applications without pressure. As usual for axial shaft seals or V-rings, the seal rotates with the shaft.

The seal body is completely made of rubber and the cross section consists of three main parts:



The TR/VL body helps to keep the seal in the right position on the shaft during rotation.

Due to the shape of the sealing lip and the resilience of the polymer used, the TR/VL seal compensates both for angular deviations as well as axial displacement between the shaft and the sealing surface.

The TR/VL is often used as a first barrier against contamination in combination with labyrinth seals.

The hinge connects the elastic sealing lip with the solid body. It works as a spring between the seal body and the sealing lip. It enables a constant pressure of the sealing lip onto the mating surface.

Exclusive features of TR/VL seals are:

- Resistance to possible shaft misalignments, angular deviations as well as axial displacements
- Narrow cross section to save space

Possible size range for TR/VL seals: $\text{ØSHAFT}_{\text{min}} = 22 \text{ mm}$; $\text{ØSHAFT}_{\text{max}} = 1\,050 \text{ mm}$ (please also see the drawing at the next page).

Materials

The standard material for the TR/VL is a nitril elastomer (NBR) with 60 Shore A filled with PTFE, but for particular applications, the TR/VA can be manufactured in different materials like hydrogenated nitril elastomer (HNBR), silicone elastomer (VMQ) or fluorocarbon elastomer (FKM). The table below shows working temperature ranges (minimum, maximum, peak (*)) applicable to each type of compound.

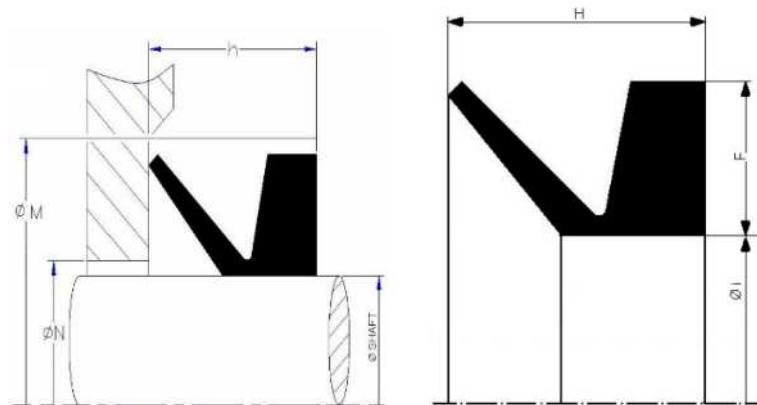
Material	Temperature	
	min	max
	°C	°C (*)
NBR	-30	+100 (+120)
HNBR	-40	+150 (+175)
VMQ	-50	+200 (+250)
FKM	-20	+200 (+250)

Assembly of TR/VL seals

The left drawing shows the details of the housing dimensions and the assembly of the TR/VL seal. In the right-hand drawing you can see the seal cross section and related dimensions.

Particular applications or requirements different from those details shall be agreed with the TENUTE Technical

Department / SKF Seals Application Engineering.



For this axial shaft seal it is important to check the shaft speed. A circumferential shaft speed exceeding 6 – 8 m/s requires an axial support, whilst over 10 – 12 m/s a radial retention is necessary.

ØSHAFT		ØN	ØM	h	H	F
Over	Up to	max	min			
Mm	mm	mm	mm	mm	mm	mm
22	1 050	ØSHAFT + 5	ØSHAFT + 20	8 ±1,5	10,5	6,5

Surface finishing

For shuffling surfaces, a roughness of Ra from 0,3 to 1,6 µm is recommended for most of the standard applications, while in case of high speeds, a finishing to Ra from 0,2 to 0,6 µm is recommended. For the shaft no special tolerance or roughness is required, but we recommend keeping Ra values below 3,2 µm.

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