

## TR/3/L

The TR/3/L seal is a rotary shaft seal developed based on SKF / TENUTE experience over the years.

The use of up-to-date materials together with an improved seal design, enables enhanced performance with reduced maintenance interventions.

The TR/3/L solid back and lip area provide a good flexibility, to compensate shaft misalignment and a maximum pressure of 0,5 bar. Furthermore, the spring embedding has been carefully studied to prevent its tilting during mounting.

The standard TR/3/L seal back is made of high resistance cotton fabric combined with a nitrile elastomer (NBR) loaded with PTFE, in lip and body areas.

The TR/3/L seal has a reduced lip interference compared to the standard TR/3 design to allow high speeds with low heat generation. All other technical data are in line with the standard model TR/3. Dimensions and tolerances are according to DIN 3760.

Exclusive features of TR/3/L seals are:

- Reduced lip interference
- Improved resistance to possible shaft misalignments
- Decreased radial force exerted on shaft
- Reduced friction and consequent temperature decrease
- Protected spring to avoid slipping/popping out from groove
- Reduced spring preload
- Absence of external metallic parts and consequent prevention of damages to housing bore

The TR/3/L is also available as split version (TR/3/L/SPLIT) enabling easier assembly (no pressure applicable) in applications, where it would be difficult or even impossible to use an endless design. Both solutions, TR/3/L endless and TR/3/L/SPLIT, require a retainer plate for a correct operation. There is also the possibility of gluing the TR/3/L/SPLIT large diameter seals, using cold or hot gluing processes.

Possible size range for TR/3/L seals:  $\varnothing d_{\min} = 15 \text{ mm}$ ;  $\varnothing D_{\max} = 2\,530 \text{ mm}$  (please also see the drawing at the next page)



## Materials

The standard material used for the TR/3/L design is a nitrile elastomer (NBR) added with PTFE, but for particular working conditions the seal can be produced in hydrogenated nitrile elastomer (HNBR) or fluorocarbon elastomer (FKM). Other combinations are available on request.

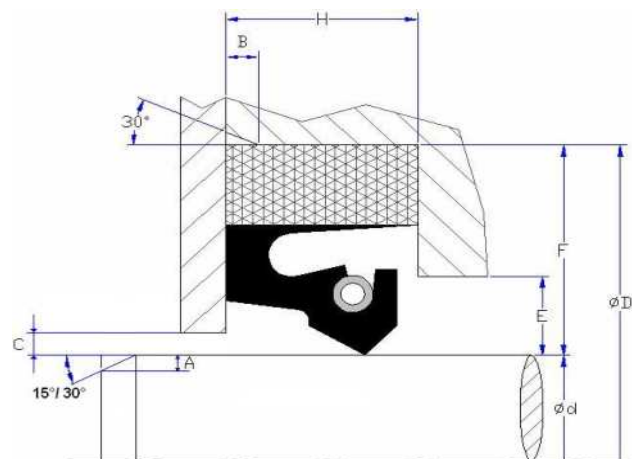
The table below shows working temperature ranges (minimum, maximum, peak (\*)) applicable to each type of compound as well as possible spring configurations.

Material	Temperature		Standard spring	Special spring	Recommended circumferential shaft speed	Misalignment
	min	max				
	°C	°C (*)			m/s	
<b>NBR</b>	-30	+100 (+120)	Carbon steel	AISI 302	15	According to cross section
<b>HNBR</b>	-40	+150 (+175)	Carbon steel	AISI 302	23	
<b>FKM</b>	-20	+200 (+250)	AISI 302	AISI 316	30	

## Assembly of TR/3/L seals

The drawing shows the details of the housing dimensions and the assembly of the TR/3/L seal.

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



$$C_{\text{maximum}} = 0,2 \times F$$

$$E_{\text{maximum}} = 0,5 \times F$$

## Shaft and housing diameter tolerance

Shaft diameter Ød		Tolerance	Housing diameter ØD		Tolerance
Over	Up to		Over	Up to	
mm	mm		mm	mm	
15	1 000	h11	30	1 000	H10
1 000	2 480	h10	1 000	2 530	H9

## Housing height tolerance

Housing height H	Tolerance
mm	mm
Up to 15	+0 / -0,1
Over 15	+0,1 / -0,1

## Shaft and housing chamfers

Shaft diameter Ød		Shaft chamfer A	Housing diameter ØD		Housing chamfers	
Over	Up to	minimum	Over	Up to	H	B
mm	mm	mm	mm	mm	mm	mm
15	50	1,5	30	50	10	1
50	250	3	50	250	15	1,5
250	800	4,5	250	800	20	2
800	1 500	6	800	1 500	30	3
1 500	2 480	7,5	1 500	2 530	40	4

## 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	50 HRC and above

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