

## TENUTE TR/4 seals

TENUTE TR/4 model has been studied and developed in order to meet specific needs of aluminium and paper rolling mills, as well as iron and steel industry in general, where applications and working conditions can be various.

The cooperation between TENUTE European engineers led to the production of a family of seals with different characteristics, especially studied to meet the needs of different applications.

The main feature of TR/4 model is the combination of two springs, granting the lip resilience necessary to withstand high misalignments and high speeds.

Having no metal case outside, TR/4

model offers the advantage of no risk of damaging the housing during assembly and disassembling phases, as well as no leakage that sometimes occurs between the outside diameter of the metal case seal and the housing. Pressure capability is max 0,5 bar.

TENUTE TR/4 seal has been patented in ITALY in July 2008, and then with International patent N°PCT/IB/2009/053141.

A further step in the development of TR/4 model will be the application of a special low friction process also patented by TENUTE, in order to reach the goal of working up to a speed of 40 m/s.



Picture 1

TR/4 model can be manufactured up to a diameter of 2.500 mm in endless form.

### MATERIALS

The standard production is in Nitril elastomer NBR added with PTFE, but for particular working conditions, TR rings can be produced in: HNBR hydrogenated nitril elastomer,

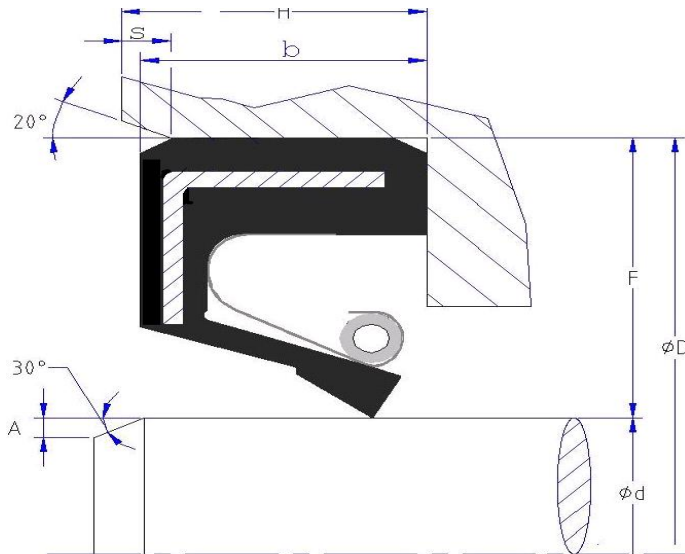
VMQ silicon elastomer, FKM fluorocarbon elastomer. Other combinations are available upon request. Table 1 shows working temperature ranges (minimum, maximum, peak) applicable to each kind of compound.

MATERIAL	TEMPERATURE C°	STANDARD SPRING
NBR	-30° +100°(120°)	AISI 301
HNBR	-40° +150°(175°)	AISI 301
VMQ	-50° +200°(250°)	AISI 301
FKM	-20° +200°(250°)	AISI 301

Table 1

### Assembly of TR/4 sealing rings

Picture 2 shows details of TR/4 housing dimensions and assembly. Particular applications or requirements different from those detailed are to be agreed with our Technical Department.



Picture 2

Housing and Shaft Tolerance					
Housing ( mm )			Shaft ( mm )		
$\phi D$	Tolerance		$\phi d$	Tolerance	
180 – 249	$\pm$	0.05	$\geq 150$	$\pm$	0.250
250 – 510	$\pm$	0.05 / -0.10			
511 – 1015	$\pm$	0.05 / -0.15			
$\geq 1015$	$\pm$	0.05 / -0.25			

Housing and housing tolerance				
Housing Height		Shaft chamfers		Housing chamfer
H	Tolerance	$\phi d$ (mm)		S
		Over	Up to	(mm)
b + 0.5	+ 0.2 / 0	50	250	4
		250	2500	7
S=0,15 x H				

### Shaft and housing surface finishing

A roughness of Ra 0.2/0.6  $\mu\text{m}$  is recommended for the shaft in normal applications, while in case of high speeds, a finishing of 0.2/0.4  $\mu\text{m}$  is recommended. Non-Plunge grinding required. For the housing bore a finish turning is sufficient.

Shaft hardness	
Up to 15m/s	Over 15m/s
40HRc	50HRc and more

Further information about assembly and applications should be asked to TENUTE Technical Dept. All information mentioned in this data-sheet are given as an indication. TENUTE Technical Department reserves the right to change and improve its products according to application specifications and test results.