

T11/BT/VT/PTV

The T11/BT/VT/PTV seal is designed for applications, where corrosion, sizes and overall dimensions could be a problem for traditional metal case seals.

Especially for the wind energy applications, the T11/BT/VT/PTV is made with a half O-ring on the top of its back for a better static sealing performance with an additional robust and flexible dust lip.



The TR11/BT/VT/PTV features a seal back in high resistance rubber/fabric and the dust lip with an exclusive antifriction band patented with number PCT/EP2006/004962.

On demand, also the main sealing lip can be equipped with the antifriction band patented with number PCT/EP2006/004962. This needs to be aligned before ordering.

A vulcanized finger spring provides a uniform distribution of pressure on the shaft exerted by the sealing lip. All the inconveniencies shown by garter spring seals are avoided, such as lip overturning, the spring popping out from its housing and consequent damages of bearing and shaft. This seal can withstand pressures up to 1 bar.

As an option (version HCF) the seal can be equipped with a metal wire insert to improve the resistance against shrinkage in the circumference.

The T11/BT/VT/PTV is also available as split version T11/BT/VT/PTV/SPLIT enabling easier assembly (no pressure applicable) in applications, where it would be difficult or even impossible to use an endless design. Both designs, T11/BT/VT/PTV endless and T11/BT/VT/PTV/SPLIT require a retainer plate for a correct operation. In the case of a SPLIT version, the option of HCF is NOT applicable.

There is also the possibility of gluing the T11/BT/VT/PTV/SPLIT large diameter seals, using cold gluing processes. In case of gluing the maximum pressure is 1 bar.

Exclusive features of T11/BT/VT/PTV seals are:

- Antifriction material vulcanized during the process according to patent PCT/EP2006/004962
- Significantly reduced friction and temperature generated by friction
- Mechanical locking of seal due to a rubber button (integrated half O-ring)
- Increased sealing capability at the static seal area due to the rubber button
- Vulcanized finger spring
- Uniform distribution of the sealing lip pressure on the shaft
- Spring fixed in groove – therefore no inconveniencies related to the spring coming out of its position e.g. during mounting
- Additional robust and flexible dust lip to prevent ingress of contaminants
- Increased resistance against circumferential shrinkage due to the metal wire insert (only valid for HCF version)

Possible size range: $\varnothing d_{\min} = 36 \text{ mm}$; $\varnothing D_{\max} = 2\,540 \text{ mm}$ (please also see the drawing at the next page).

Materials

The materials used for the T11/BT/VT/PTV seal may vary depending on the application demands. Standard and special products are made according to the table below. SKF Seals Application Engineering / TENUTE Technical Department is available for any further investigation on different materials.

Standard production		Special production on demand	
Lip	NBR	Lip	HNBR, FKM, EPDM, MVQ
Spring	AISI 301	Spring	AISI 301 – AISI 316

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

Material	Temperature		Recommended circumferential shaft speed
	min	max	max
	°C	°C (*)	m/s
NBR	-30	+100 (+120)	10
HNBR	-40	+150 (+175)	18
VMQ	-50	+200 (+250)	24
FKM	-20	+200 (+250)	24

The PTFE compounds used for the T11/BT/VT/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 TENUTE Technical Department / SKF Seals Application Engineering.

1* ... PTFE with glass and molybdenum bisulfide

2* ... PTFE with carbon and graphite

3* ... PTFE with bronze

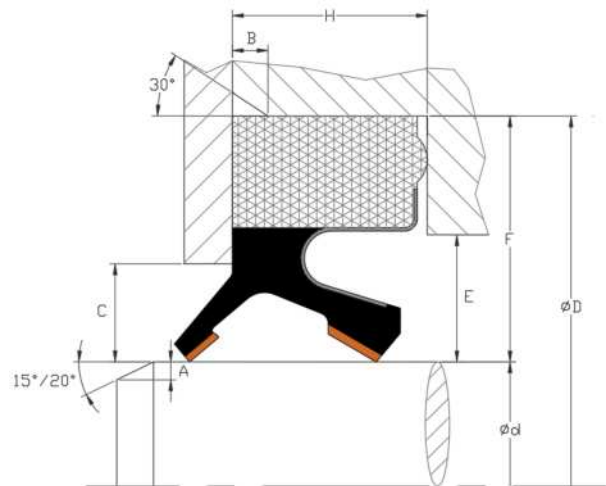
4* ... PTFE with bronze and molybdenum bisulfide

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

Assembly of T11/BT/VT/PTV seals

The drawing shows the details of the housing dimensions and the assembly of the T11/BT/VT/PTV seal in applications without pressure.

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



C is related to the seal dimension and needs to be aligned before ordering

$$E_{\text{minimum}} = 0,3 \times F; E_{\text{maximum}} = 0,5 \times F$$

Shaft and housing diameter tolerance

Shaft diameter Ød		Tolerance	Housing diameter ØD		Tolerance
Over	Up to		Over	Up to	
mm	mm		mm	mm	
36	1 000	h11	56	1 000	H10
1 000	2 480	h10	1 000	2 540	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
36	50	1,5	56	250	15	1,5
50	250	3	250	800	20	2
250	800	4,5	800	1 500	30	3
800	1 500	6	1 500	2 540	40	4
1 500	2 480	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	50 HRC and above

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