Contents

ISO 9001 ISO 9002

The information in this brochure is based on many decades of experience in the manufacture and application of sealing and bearing systems. However, unknown parameters and conditions may restrict general statements during usage. It is vital that customers satisfy themselves as to the suitability of individual products through adequate testing. For this reason, and due to the wide range of applications of our products, Busak + Shamban can accept no liability as to the suitability or correctness of our recommendations in individual cases.

The application limits for pressure, temperature and speed given in this catalogue are maximum values determined in the laboratory. During practical applications it should be remembered that due to the interaction of the operating parameters, the maximum values must be set correspondingly lower. For exceptional operating conditions, please contact your Busak+Shamban representative.

This edition supersedes all previous brochures.

Description

Standard radial shaft seals have only a limited application range with respect to pressure, temperature and media loads due to their elastomer sealing lip. Furthermore they only have a limited suitability for applications with inadequate lubrication.

Varilip® shaft seals from Busak+Shamban extend this application range by using modern Turcon® materials developed specially for rotational applications.

They are characterised in particular by the low friction and their stick-slip-free running, thus reducing the heat development and permitting higher peripheral speeds.

The Varilip® shaft seal is dimensionally interchangeable with the shaft seals to DIN 3760 and ISO 6194/1.

The minimal groove size required for Varilip® allows its use as a pressurised seal where the installation of a mechanical shaft seal would not be possible due to constructional reasons.

Characteristics

In contrast to the conventional shaft seals, the Varilip® seal requires no metallic energising spring.

As can be seen from Figure 1, dynamic sealing is effected by the radial load of the sealing lip against the shaft. Static sealing is effected on the one hand by a press fit of the metallic casing in the housing bore and, on the other, by an elastomeric flat gasket between metallic housing and Turcon® sealing lip.

Varilip®, Type A

Type A is a one-lip seal suitable for use in standard industrial applications up to $p_{max} = 0.5$ MPa (5 bar) where a radial shaft seal would be unable to withstand the temperature, friction, medium or poor lubrication. Type A allows high- speed shafts with peripheral speeds of up to 40 m/s to be sealed.

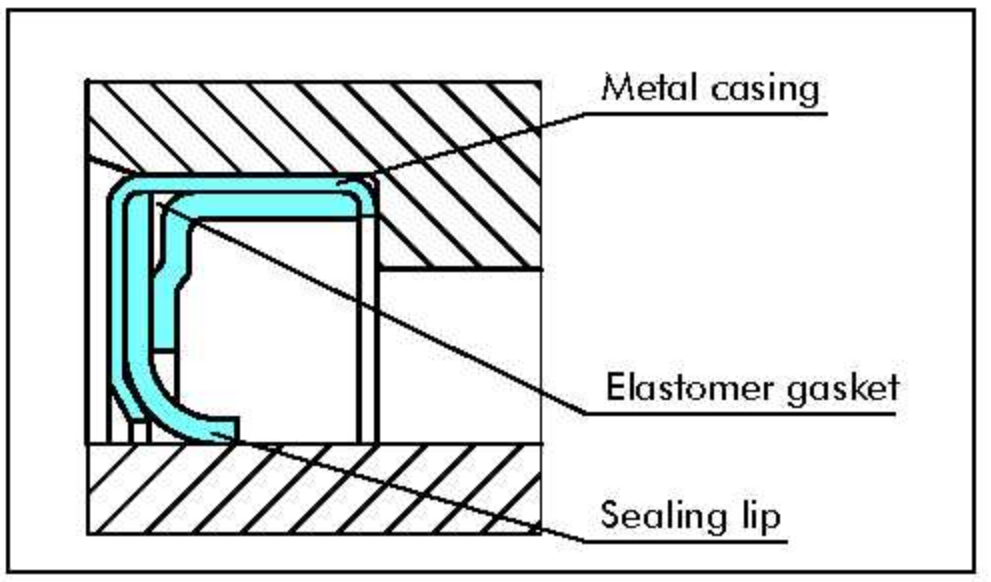


Figure 1 Type A

Varilip®, Type B

Type B is the preferred choice for applications in which a high sealability is demanded or where contaminated media are to be sealed. This two-lip type offers greater safety than the Type A.

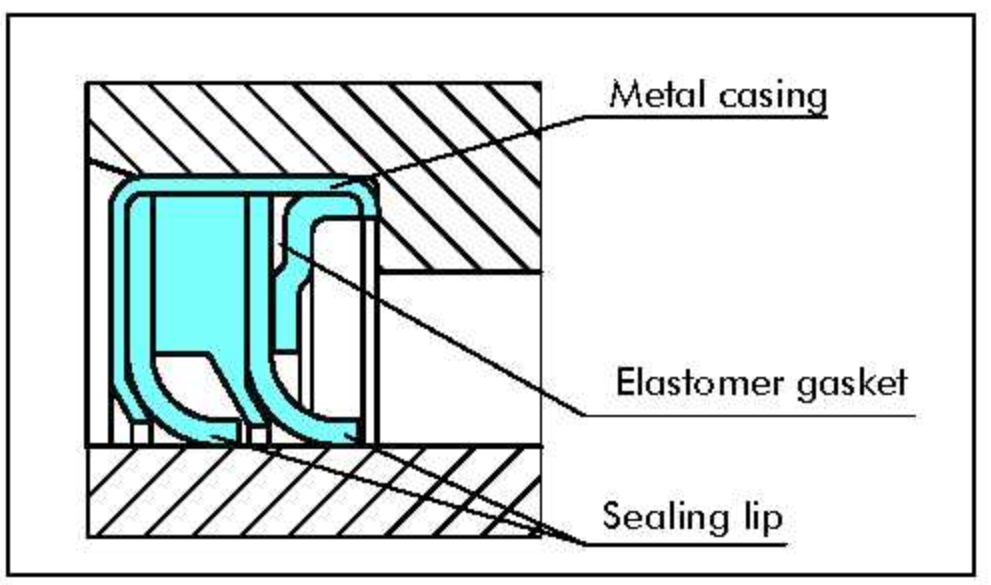


Figure 2 Type B

Varilip®, Type C

The Varilip® Type C can be used for applications involving higher pressures for which a simple elastomer radial shaft seal can no longer to be considered. Due to a reinforcement of the sealing lip, pressures of up to 2 MPa (20 bar) are possible, e.g. as pump, shaft or rotor seals.

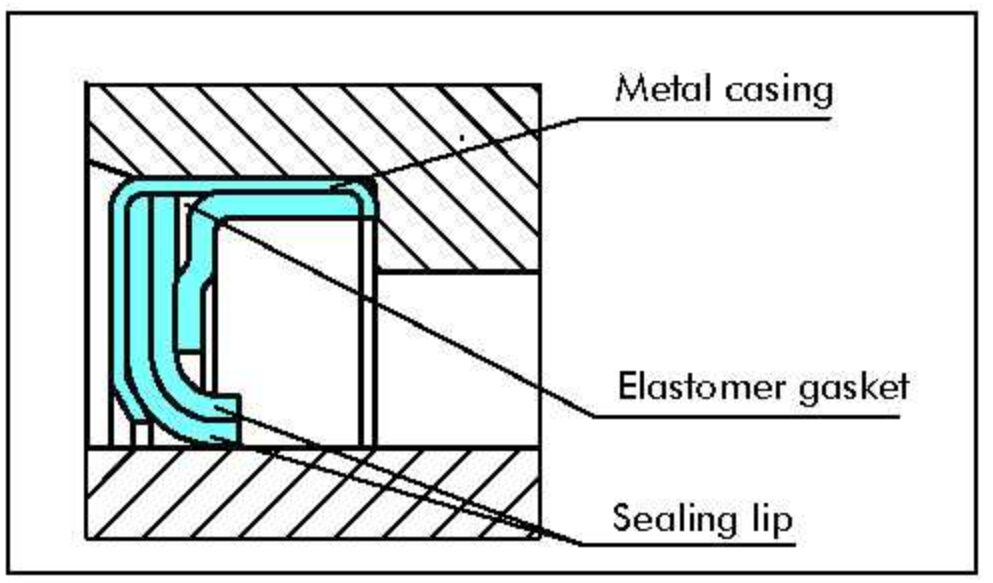


Figure 3 Type C

Varilip®, Type D

Whilst Types A to C can be used to seal against pressures from only one side, Type D can be subjected to pressure from both sides. Pressures of up to 0.1 MPa (1 bar) are permissible. The separation of two different media using a single seal is possible. The second lip can also take on the function of a wiper or dust lip. A grease packing between the sealing lips is recommended.

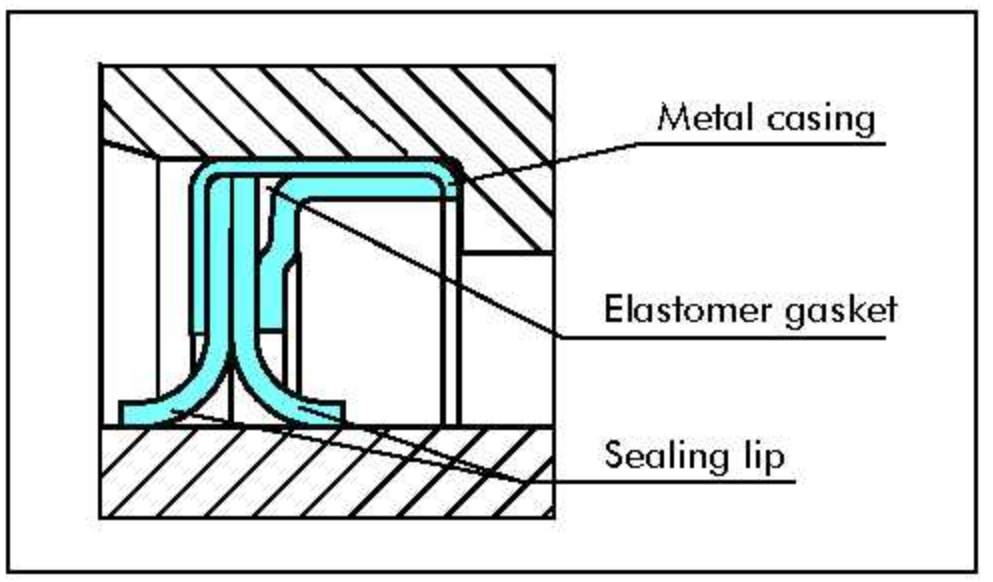


Figure 4 Type D

Table I summarises the important technical data and selection criteria for the different Varilip® types. Furthermore it gives an overview of the most significant applications in which the various Varilip® types have already proven themselves in practice.

This table is intended to allow the designer a quick preselection of the most favourable seal type and the optimum material for his specific application.

Further details and design and installation instructions for the different Varilip® types are given on pages 7 to 9. Information on materials and application limits of the various material combinations is given on page 6.

Quality Criteria

The cost-effective use of seals and bearings is highly influenced by the quality criteria applied in production. Seals and bearings manufactured by Busak+Shamban are continuously monitored according to strict quality standards from material acquisition through to delivery.

Certification of our production plants in accordance with international standards EN ISO 9000 meets the specific requirements for quality control and management of purchasing, production and marketing functions.

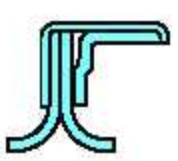
Our quality policy is consistently controlled by strict procedures and guidelines which are implemented within all strategic areas of the company.

All testing of materials and products is performed in accordance with accepted test standards and specifications, e.g. random sample testing in accordance with DIN ISO 2859 part 1/ANSI/ASQC Z 1.4-1993/ MIL-STD- 105 E. Inspection specifications correspond to standards applicable to individual product groups (e.g. for O-Rings: ISO 3601/DIN 3771).

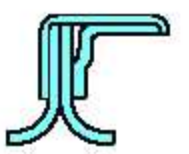
Our sealing materials are produced free of chlorofluorinated hydrocarbons and carcinogenic elements.

The 10th digit of our article number defines the quality characteristics of the part. A hyphen indicates compliance with standard quality criteria outlined in this catalogue. Customer-specific requirements are indicated by a different symbol in this position. Customers who require special quality criteria should contact their local Busak+Shamban sales office for assistance. We have experience to meet all customer quality requirements.

Table I Selection criteria for Varilip®

Seal	Application					Material		Installation		Standard
Type	Field of application				Function	Lip material designation	Shaft surface hardness	Size range mm ∅	Groove type	DIN/ISO
		light	medium	heavy						
Varilip® **A** 	Pumps Separators Compressors Crankshafts Hubs Fans Centrifuges	•	•	-	Single-acting	Turcon® T25	>55HRC	6 - 170	Open casing	DIN 3760 ISO 6194/1
						Turcon® T78	>170 HB			
Varilip® **B** 	Machine tools Gearboxes Mixers Crankshafts	•	•	-	Single-acting	Turcon® T25	>55HRC	6 - 170	Open casing	DIN 3760 ISO 6194/1
						Turcon® T78	>170 HB			
Varilip® **C** 	Pumps Machine tools Compressors	-	-	•	Single-acting	Turcon® T25	>55HRC	6 - 170	Open casing	DIN 3760 ISO 6194/1
						Turcon® T78	>170 HB			
Varilip® **D** 	Separators Hubs Bearings Mixers	•	-	-	Double-acting	Turcon® T25	>55HRC	6 - 170	Open casing	DIN 3760 ISO 6194/1
						Turcon® T78	>170 HB			

Important selection criteria

Technical data			Technical behaviour				Seal
Pressure MPa (bar)	Temperature range °C	Speed* m/s	Friction	Medium compatibility	Dynamic sealing performance	Service life	Type
0.5 (5)	-60 to +200	40	A	A	B	B	Varilip® **A** 
0.5 (5)	-60 to +200	20	B	A	A	A	Varilip® **B** 
2.0 (20)	-60 to +200	20	C	A	B	A	Varilip® **C** 
0.1 (1)	-60 to +200	20	B	A	B	B	Varilip® **D** 

* See section "Application limits", on page 6

For special applications such as e.g. in vacuum operation, gas applications, etc., please contact Busak+Shamban.

A very good
B good
C satisfactory

Materials

An important factor for the proper function of rotational seals is the material. For this reason, Busak+Shamban has developed a range of specially modified materials for rotational applications on the basis of the proven Turcon® materials. Particular importance was attached to the optimisation of friction and wear properties, even at high peripheral speeds.

Figure 5 shows the standard materials used for Varilip® seals.

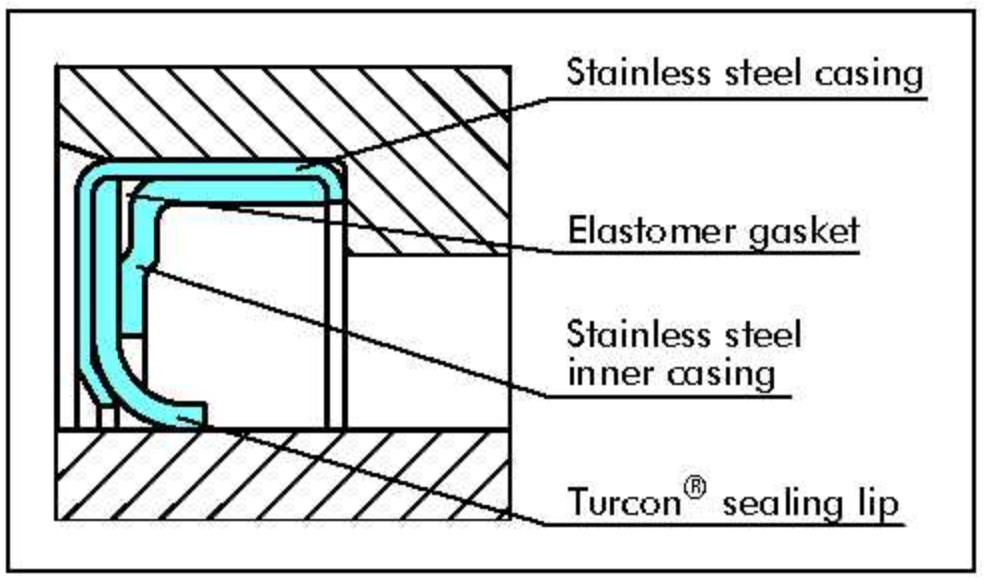


Figure 5 Materials for Varilip® seals

Two standard materials are available for the sealing lip:

Turcon® T25

This standard material with exceptional wear and friction characteristics is suitable for a large temperature range and is resistant to most media. Good results are achieved if the shaft surface has a minimum hardness of 55 HRc. It is generally well-suited to oxide ceramic surfaces produced by plasma coating.

At low pressures and speeds up to 4 m/s, a hardness of the mating surface of 45 HRC is sufficient.

Turcon® T78

This material is characterised by its particularly good running behaviour. This permits its use for dry running applications, applications with poor lubrication and in conjunction with soft shaft surfaces, e.g. in applications in the chemical industry when stainless steel has to be used as shaft material. The hardness of the mating surface should not be less than 170 HB.

Further information on the materials for seal casings and gaskets is contained in Tables II to IV.

Table II Material selection for sealing lip

Mating surface	Application limits	Material
> 55 HRC	Pressure < 2 MPa	**Turcon® T25** Turcon® T78
> 170 HB	Pressure < 0.2 MPa	Turcon® T78

Table III Casing materials

Medium	Material	Material Code
Oils, greases, air/gases,water, vapour,solvents, foodstuffs	Stainless steel Material No. 1.4301 AISI 304	1
Acids, caustics, seawater	Acid-resistant stainless steel Material No. 1.4436 AISI 316	2
	Acid-resistant stainless steel Material No. 1.4571 AISI 316 Ti	3*)

*) Only for type **A**,**C** and **D** up to max. 90 mm outside diameter.

Table IV Materials for gasket elastomers

Medium	Temperature	Material	Code
Air,water, oils'greases	Nitrile-Elastomer - 30 to + 110°C	NBR	N
Air,water, vapour, foodstuffs, alcohols	Ethylene-propylene-elastomer - 60 to + 150°C	EPDM	E
Air,water,oils, greases, solvents,acids, caustics	Fluoroelastomer - 20 to + 200°C	FKM	V

Application Limits

The limits for temperature, pressure and speed given in this catalogue cannot be fully exploited at the same time.

Furthermore, the lubrication properties, the media, the heat dissipation and the condition of the shaft surface affects the application limits.

The following p x v values can be used as general guidelines:
For shaft diameter from 30 mm to 170 mm:
up to 3 (MPa x m/s) with good lubrication
up to 1.5 (MPa x m/s) with poor lubrication
up to 10 (MPa x m/s) with very good cooling

For smaller shaft diameters, the values must be reduced.

Design Instructions

Groove Design

Varilip® shaft seals in Table VII, pages 11-13, fit into grooves according to DIN 3760 or ISO 6194/1.

The recommendations defined in the standards apply to the grooves.

Shaft lead-in chamfer

During the installation of Varilip®, careful handling is necessary in order to avoid damaging the sealing lip. Depending on the design, several installation methods can be employed.

If the seal is mounted with its back to the shaft, the shaft ends must be rounded or lead-in chamfers must be provided (see figure 7).

When installing the seal on a shaft with the sealing lip against the end of the shaft, a lead-in chamfer is necessary (see Figure 6) whose smallest diameter is smaller than the diameter of the unstressed sealing lip. Table V contains guide values.

Table V Shaft lead-in chamfer

Shaft-Ø d_1	6 - 60	65 - 135	140 - 170
Cone-Ø d_3	d_1 - 3	d_1 - 4	d_1 - 5.5

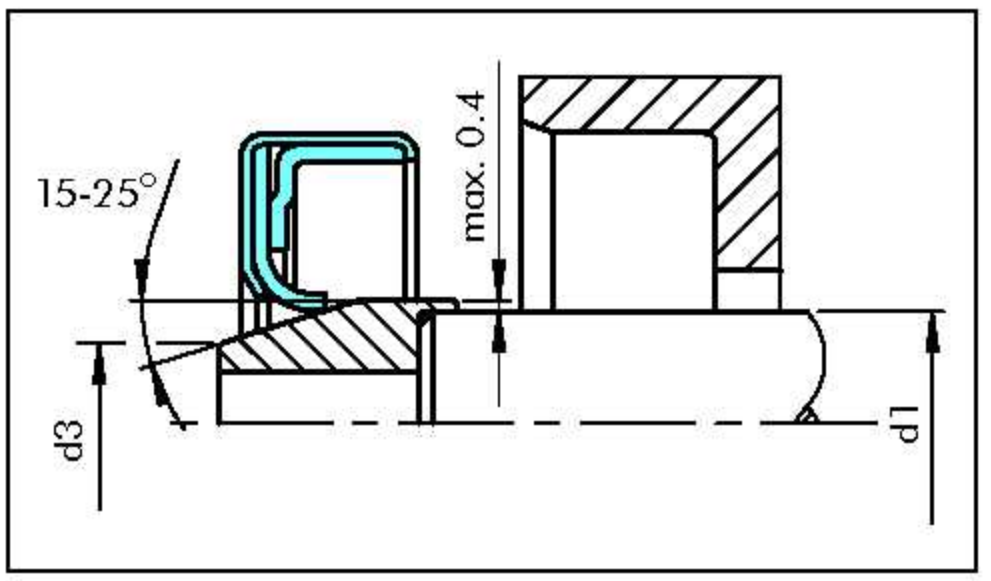


Figure 6 Fitting of the sealing lip with installation tool

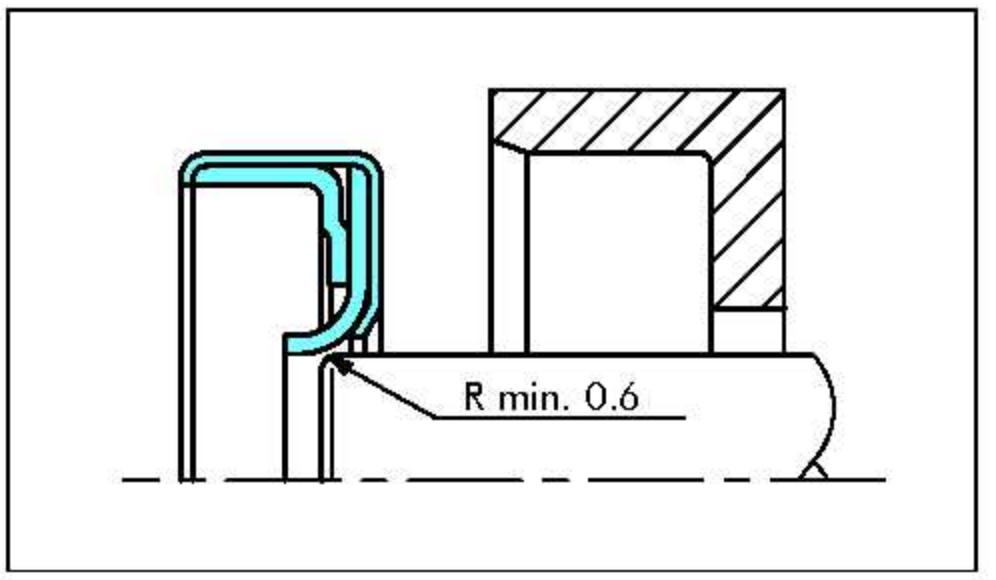


Figure 7 Fitting of the sealing lip with its back to the shaft

Shaft Surface Roughness

The functional reliability and service life of a seal depend to a very great extent on the quality and surface finish of the shaft surface to be sealed.

Scores, scratches, pores, concentric or spiral machining marks are not permitted. Ideally, dynamic shaft surfaces should be ground spiral-free.

The characteristics most frequently used to describe the surface microfinish R_a, R_z and R_{max} are defined in DIN 4762/ISO 4287/1 and DIN 4768. These characteristics alone, however, are not sufficient for assessing the suitability in seal engineering.

In addition, the material contact area M_r (previously percentage contact area tp) in accordance with DIN 4762/ISO 4287/1 should be additionally demanded. The material contact area is determined in each case by the specific profile form. This in turn is directly dependent on the machining process employed.

In the Busak+Shamban recommendations, the surface finishes are defined as follows:

Table VI Surface roughness

Surface roughness µm		
	Shaft surface	**Housing bore**
R_{max}	1.00 - 4.00	< 10.0
R_z	0.63 - 2.50	< 6.3
R_a	0.10 - 0.40	< 1.6

The material contact area M_r should be approx. 50 to 70%, determined at a cut depth $c = 0.25 \times R_z$, relative to a reference line $c_{ref.}$ 5%.

Coaxiality Tolerance

In order to achieve a uniform radial load of the sealing lip on the surface of the shaft, the best possible coaxiality should exist between shaft and housing bore.

The maximum permissible coaxial deviation as a function of shaft diameter is shown in Figure 8.

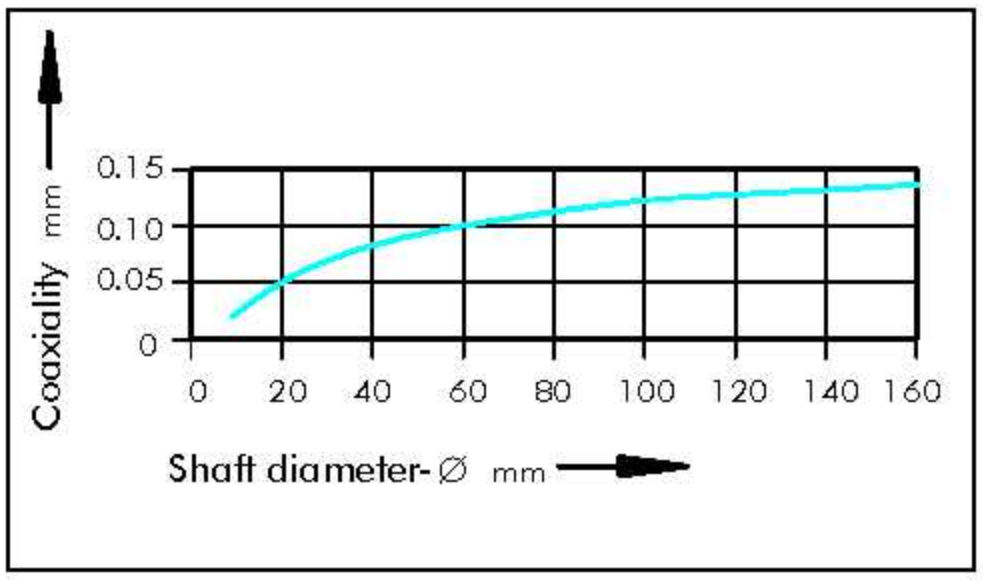


Figure 8 Coaxiality tolerance

Shaft runout Tolerance

In order to maintain the sealing function, the shaft eccentricity as a function of the speed must be limited as shown in Figure 9.

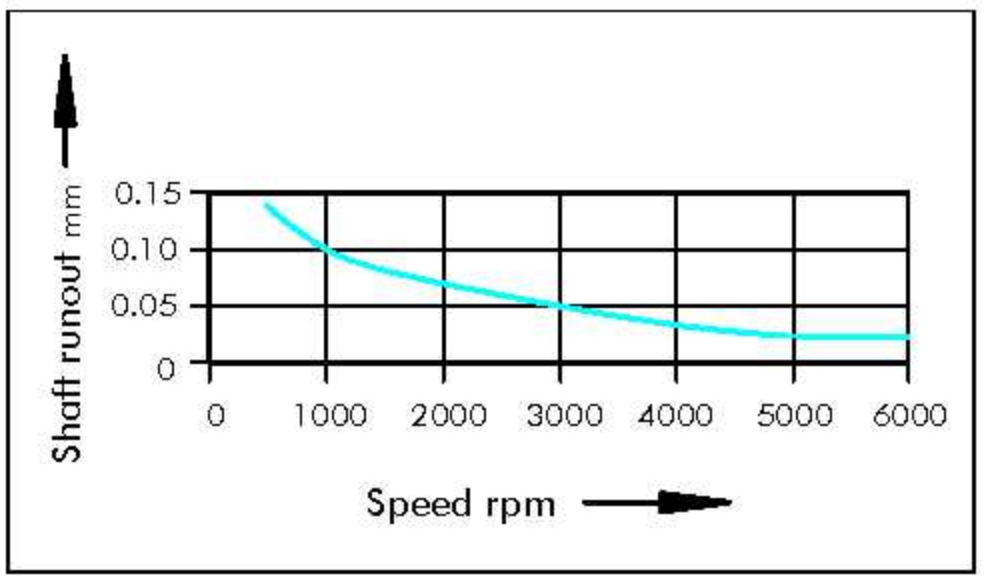


Figure 9 Max. shaft runout

Power consumption, dry running

Guide values for the frictional power consumption can be determined from the curve in Figure 10. It is plotted as a function of surface speed and operating pressure for a shaft diameter of 50 mm for a Varilip® type A and lip material T25.

Guide values for other shaft diameters can be calculated from the formula

$$p = p_{50} \times \left(\frac{d}{50\ mm}\right) \quad [W]$$

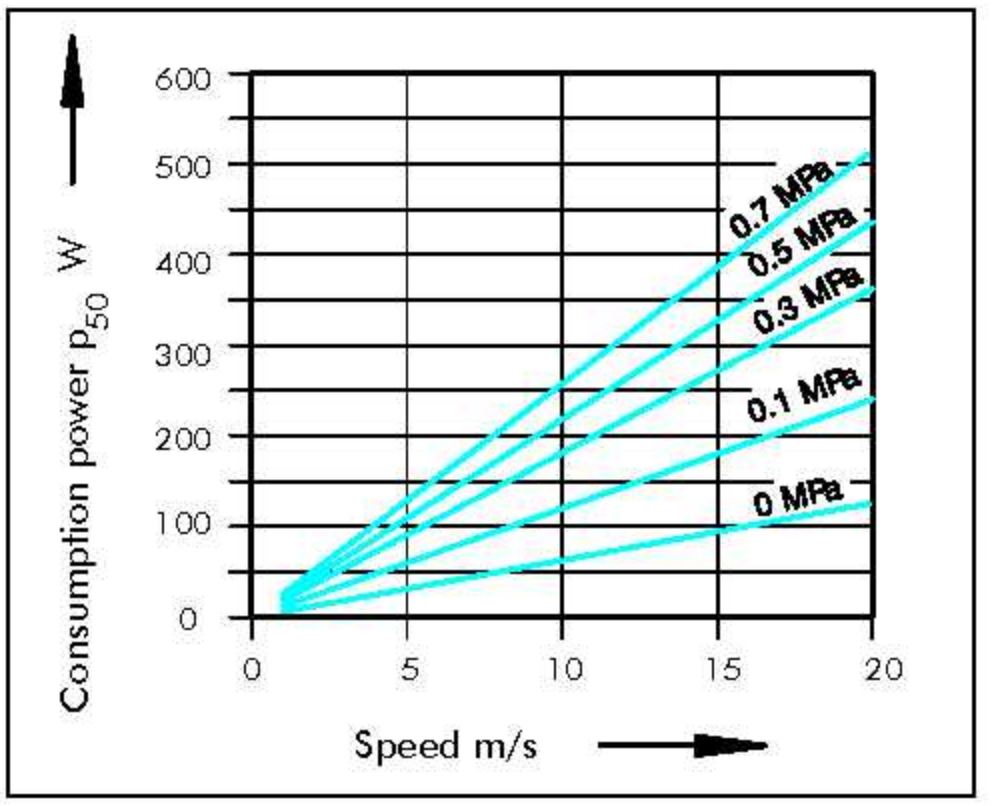


Figure 10 Power consumption on a 50 mm shaft-∅

Torque

Figure 11 shows the torque as a function of the operating pressure for various Varilip® types and Turcon® materials for a shaft diameter of 50 mm. The torque for other shaft diameters can be roughly calculated from the formula

$$M = M_{50} \times \left(\frac{d}{50\ mm}\right)^2 \quad [Nm]$$

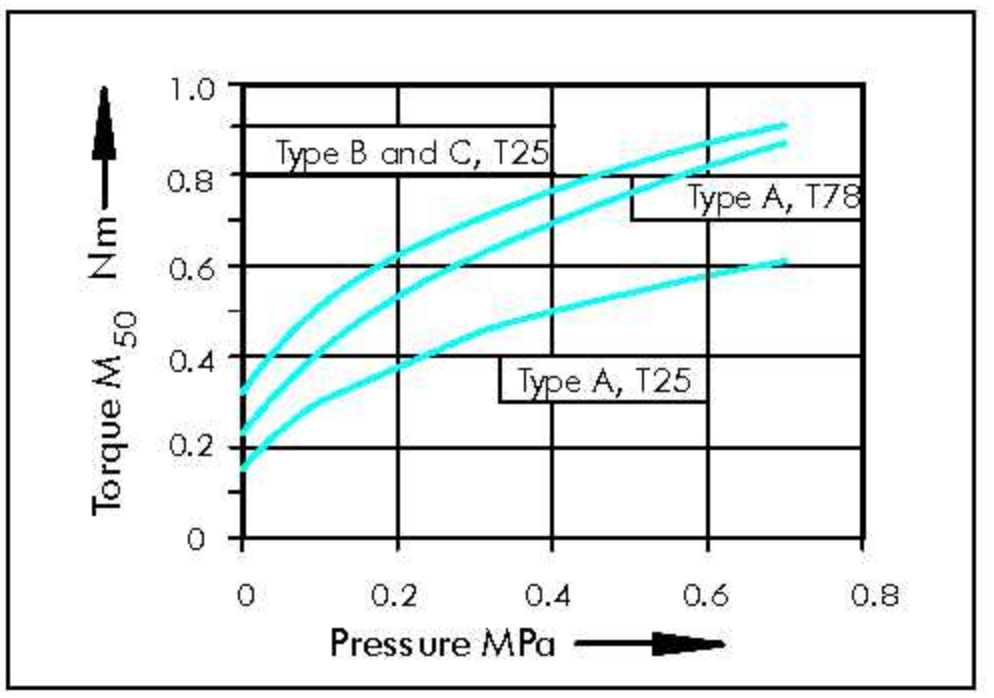


Figure 11 Torque on a 50 mm shaft-∅

Installation Instructions

Preparation for Installation

The following points should be observed before installation of the seals:

- Check whether the shaft and the housing bore have an adequate lead-in chamfer
- Deburr and chamfer or round sharp edges, cover the tips of any screw threads
- Remove machining residues such as chips, dirt and other foreign particles and carefully clean all parts
- Use no sharp-edged installation tools
- Oil the seals before installation or use a suitable lubricant
- Only grease without solid additives (e.g. molybdenum disulphide or zinc sulphide additives) may be used for grease lubrication.

Installation in Housing

Varilip® shaft seals have a press fit in the housing. In order to avoid deformation of the seals, installation tools made e.g. of plastic such as that shown in Figure 12 should be used.

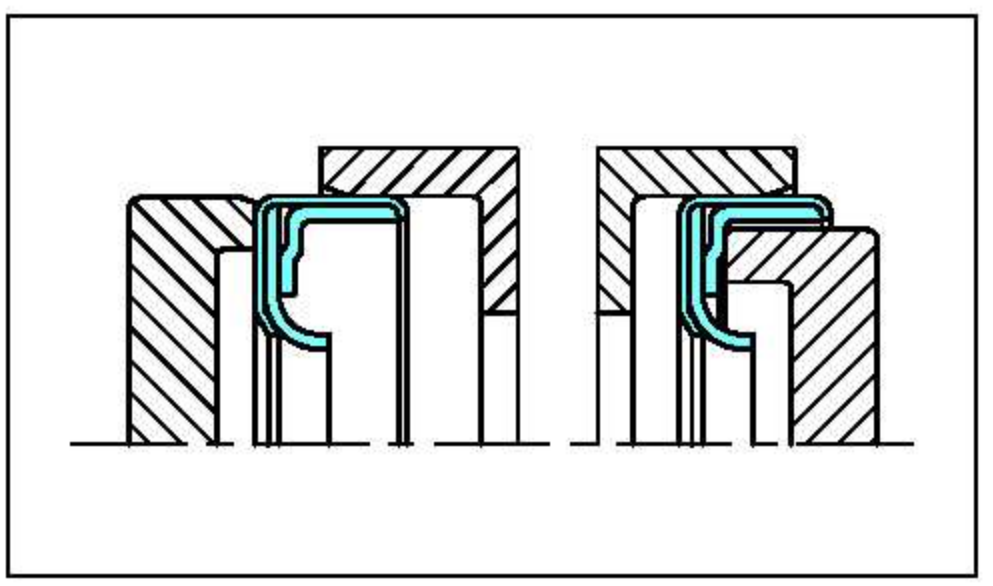


Figure 12 Installation using installation tools

Installation Recommendations

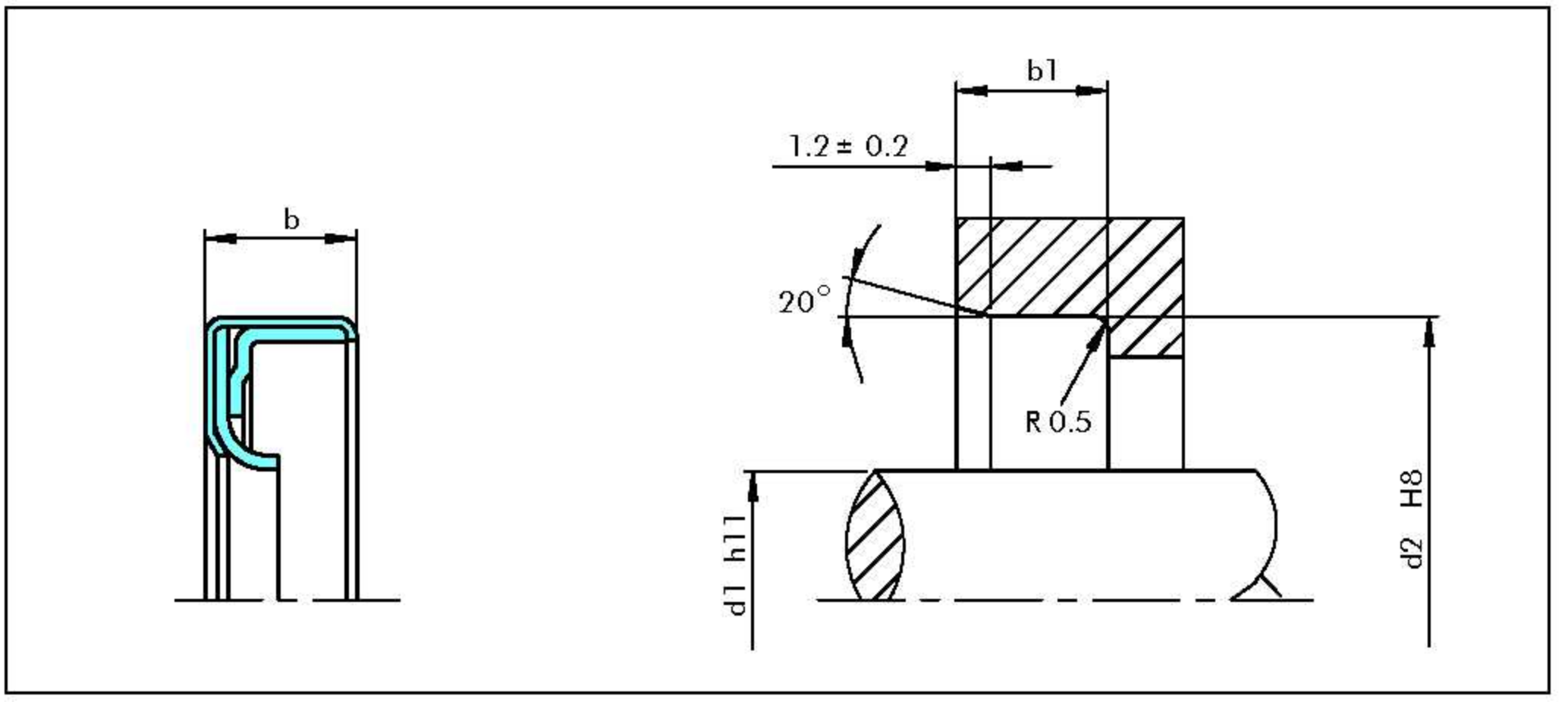


Figure 13 Installation drawing for pressure up to 0.2 MPa (2 bar)

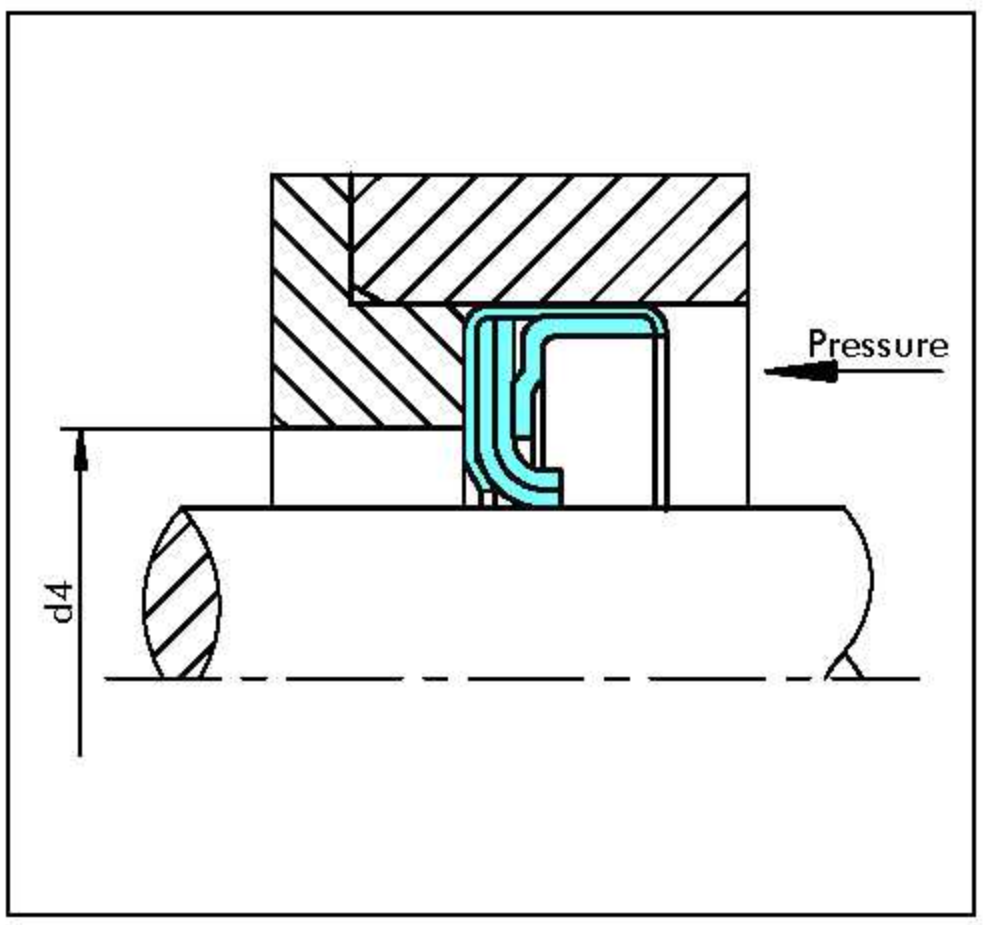


Figure 14 Installation for pressure from 0.2 MPa (2bar) up to 2 MPa (20 bar)

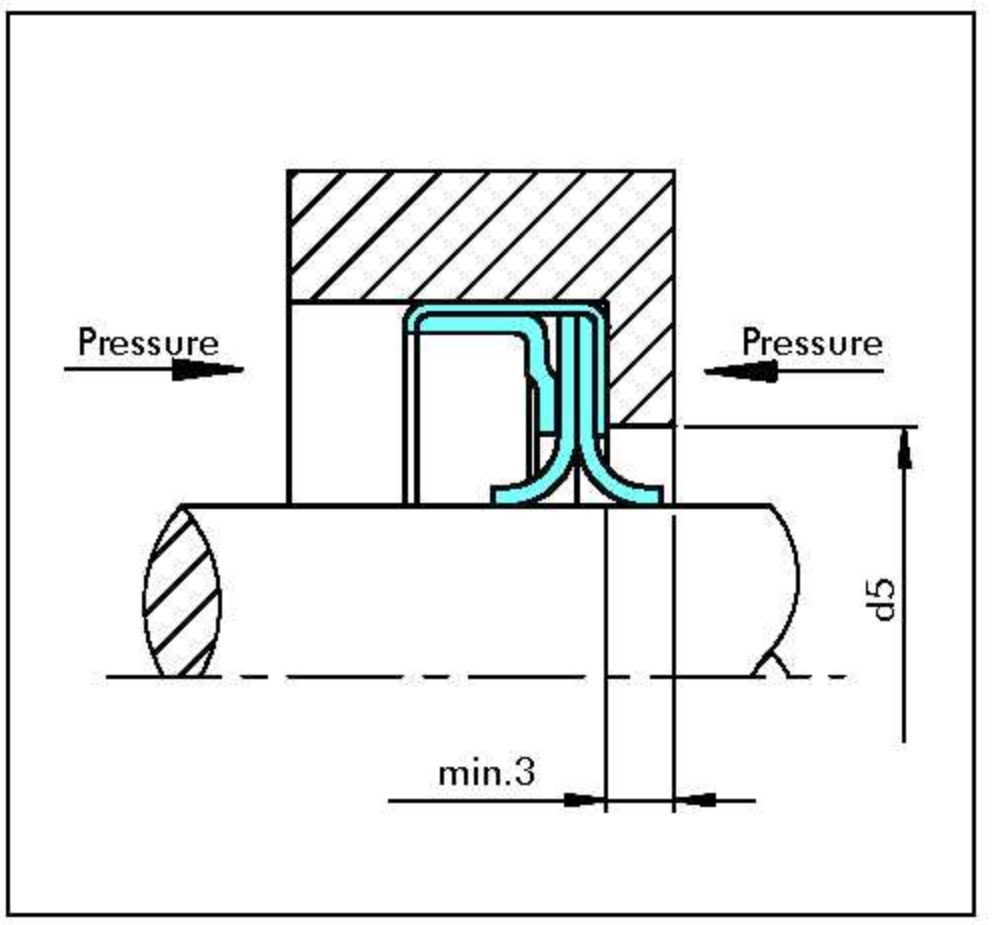


Figure 15 Installation type D

Table VII Preferred Series

Sizes						
d_1	d_2	b	Part No.	$b_{1\ min.}$	$d_{4\ max.}$	$d_{5\ min.}$
6	16	7	TP_100060	7.3	10	9.6
6	22	7	TP_200060	7.3	10	9.6
7	22	7	TP_100070	7.3	11	10.6
8	22	7	TP_100080	7.3	12	11.6
8	24	7	TP_200080	7.3	12	11.6
9	22	7	TP_100090	7.3	13	12.6
9	24	7	TP_200090	7.3	13	12.6
9	26	7	TP_300090	7.3	13	12.6
10	22	7	TP_100100	7.3	14	13.6
10	24	7	TP_200100	7.3	14	13.6
10	**25**	**7**	**TP_300100**	**7.3**	**14**	**13.6**
10	26	7	TP_400100	7.3	14	13.6
11	22	7	TP_100110	7.3	15	14.6
11	26	7	TP_200110	7.3	15	14.6
12	22	7	TP_100120	7.3	16	15.6
12	24	7	TP_200120	7.3	16	15.6
12	**25**	**7**	**TP_300120**	**7.3**	**16**	**15.6**
12	28	7	TP_400120	7.3	16	15.6
12	30	7	TP_500120	7.3	16	15.6
14	24	7	TP_100140	7.3	18	17.6
14	28	7	TP_200140	7.3	18	17.6
14	30	7	TP_300140	7.3	18	17.6
14	35	7	TP_400140	7.3	18	17.6
15	26	7	TP_100150	7.3	19	18.6
15	**30**	**7**	**TP_200150**	**7.3**	**19**	**18.6**
15	32	7	TP_300150	7.3	19	18.6
15	35	7	TP_400150	7.3	19	18.6
16	28	7	TP_100160	7.3	20	19.6
16	30	7	TP_200160	7.3	20	19.6
16	32	7	TP_300160	7.3	20	19.6
16	35	7	TP_400160	7.3	20	19.6
17	28	7	TP_100170	7.3	21	20.6
17	30	7	TP_200170	7.3	21	20.6
17	32	7	TP_300170	7.3	21	20.6
17	35	7	TP_400170	7.3	21	20.6
17	40	7	TP_500170	7.3	21	20.6
18	**30**	**7**	**TP_100180**	**7.3**	**22**	**21.6**
18	32	7	TP_200180	7.3	22	21.6
18	35	7	TP_300180	7.3	22	21.6
18	40	7	TP_400180	7.3	22	21.6

Sizes			Part No.	$b_{1\ min.}$	$d_{4\ max.}$	$d_{5\ min.}$
d_1	d_2	b				
20	30	7	TP_100200	7.3	24	23.6
20	32	7	TP_200200	7.3	24	23.6
20	**35**	**7**	**TP_300200**	**7.3**	**24**	**23.6**
20	40	7	TP_400200	7.3	24	23.6
20	47	7	TP_500200	7.3	24	23.6
22	32	7	TP_100220	7.3	26	25.6
22	**35**	**7**	**TP_200220**	**7.3**	**26**	**25.6**
22	40	7	TP_300220	7.3	26	25.6
22	47	7	TP_400220	7.3	26	25.6
24	35	7	TP_100240	7.3	28	27.6
24	37	7	TP_200240	7.3	28	27.6
24	40	7	TP_300240	7.3	28	27.6
24	47	7	TP_400240	7.3	28	27.6
25	35	7	TP_100250	7.3	29	28.6
25	40	7	TP_200250	7.3	29	28.6
25	42	7	TP_300250	7.3	29	28.6
25	**47**	**7**	**TP_400250**	**7.3**	**29**	**28.6**
25	52	7	TP_500250	7.3	29	28.6
26	37	7	TP_100260	7.3	30	29.6
26	42	7	TP_200260	7.3	30	29.6
26	47	7	TP_300260	7.3	30	29.6
28	40	7	TP_100280	7.3	32	31.6
28	**47**	**7**	**TP_200280**	**7.3**	**32**	**31.6**
28	52	7	TP_300280	7.3	32	31.6
30	40	7	TP_100300	7.3	34	33.6
30	42	7	TP_200300	7.3	34	33.6
30	**47**	**7**	**TP_300300**	**7.3**	**34**	**33.6**
30	52	7	TP_400300	7.3	34	33.6
30	62	7	TP_500300	7.3	34	33.6
32	45	7	TP_100320	7.3	36	35.6
32	45	8	TP_200320	8.3	36	35.6
32	**47**	**7**	**TP_300320**	**7.3**	**36**	**35.6**
32	47	8	TP_400320	8.3	36	35.6
32	52	7	TP_500320	7.3	36	35.6
32	52	8	TP_600320	8.3	36	35.6
35	**47**	**7**	**TP_100350**	**7.3**	**39**	**38.6**
35	50	7	TP_200350	7.3	39	38.6
35	50	8	TP_300350	8.3	39	38.6
35	52	7	TP_400350	7.3	39	38.6
35	52	8	TP_500350	8.3	39	38.6
35	55	8	TP_600350	8.3	39	38.6
35	62	7	TP_700350	7.3	39	38.6

Sizes						
d_1	d_2	b	Part No.	$b_{1\ min.}$	$d_{4\ max.}$	$d_{5\ min.}$
36	47	7	TP_100360	7.3	40	39.6
36	50	7	TP_200360	7.3	40	39.6
36	52	7	TP_300360	7.3	40	39.6
36	62	7	TP_400360	7.3	40	39.6
38	52	7	TP_100380	7.3	42	41.6
38	55	7	TP_200380	7.3	42	41.6
38	55	8	TP_300380	8.3	42	41.6
38	58	8	TP_400380	8.3	42	41.6
38	62	7	TP_500380	7.3	42	41.6
38	62	8	TP_600380	8.3	42	41.6
40	52	7	TP_100400	7.3	44	43.6
40	55	7	TP_200400	7.3	44	43.6
40	55	8	TP_300400	8.3	44	43.6
40	**62**	**7**	**TP_400400**	**7.3**	**44**	**43.6**
40	62	8	TP_500400	8.3	44	43.6
40	72	7	TP_600400	7.3	44	43.6
42	55	8	TP_100420	8.3	46	45.6
42	62	8	TP_200420	8.3	46	45.6
42	72	8	TP_300420	8.3	46	45.6
45	60	8	TP_100450	8.3	49	48.6
45	**62**	**8**	**TP_200450**	**8.3**	**49**	**48.6**
45	65	8	TP_300450	8.3	49	48.6
45	72	8	TP_400450	8.3	49	48.6
48	62	8	TP_100480	8.3	52	51.6
48	72	8	TP_200480	8.3	52	51.6
50	65	8	TP_100500	8.3	54	53.6
50	68	8	TP_200500	8.3	54	53.6
50	**72**	**8**	**TP_300500**	**8.3**	**54**	**53.6**
50	80	8	TP_400500	8.3	54	53.6
52	68	8	TP_100520	8.3	56	55.6
52	72	8	TP_200520	8.3	56	55.6
55	70	8	TP_100550	8.3	59	58.6
55	**72**	**8**	**TP_200550**	**8.3**	**59**	**58.6**
55	80	8	TP_300550	8.3	59	58.6
55	85	8	TP_400550	8.3	59	58.6
56	70	8	TP_100560	8.3	60	59.6
56	72	8	TP_200560	8.3	60	59.6
56	80	8	TP_300560	8.3	60	59.6
56	85	8	TP_400560	8.3	60	59.6
58	72	8	TP_100580	8.3	62	61.6
58	80	8	TP_200580	8.3	62	61.6

Sizes			Part No.	$b_{1\ min.}$	$d_{4\ max.}$	$d_{5\ min.}$
d_1	d_2	b				
60	75	8	TP_100600	8.3	64	63.6
60	**80**	**8**	**TP_200600**	**8.3**	**64**	**63.6**
60	85	8	TP_300600	8.3	64	63.6
60	90	8	TP_400600	8.3	64	63.6
62	85	10	TP_100620	10.3	68	66.4
62	90	10	TP_200620	10.3	68	66.4
63	85	10	TP_100630	10.3	69	67.4
63	90	10	TP_200630	10.3	69	67.4
65	**85**	**10**	**TP_100650**	**10.3**	**71**	**69.4**
65	90	10	TP_200650	10.3	71	69.4
65	100	10	TP_300650	10.3	71	69.4
68	90	10	TP_100680	10.3	74	72.4
68	100	10	TP_200680	10.3	74	72.4
70	**90**	**10**	**TP_100700**	**10.3**	**76**	**74.4**
70	95	10	TP_200700	10.3	76	74.4
70	100	10	TP_300700	10.3	76	74.4
72	95	10	TP_100720	10.3	78	76.4
72	100	10	TP_200720	10.3	78	76.4
75	**95**	**10**	**TP_100750**	**10.3**	**81**	**79.4**
75	100	10	TP_200750	10.3	81	79.4
78	100	10	TP_100780	10.3	84	82.4
80	**100**	**10**	**TP_100800**	**10.3**	**86**	**84.4**
80	110	10	TP_200800	10.3	86	84.4
85	110	12	TP_100850	12.4	91	89.4
85	120	12	TP_200850	12.4	91	89.4
90	110	12	TP_100900	12.4	96	94.4
90	**120**	**12**	**TP_200900**	**12.4**	**96**	**94.4**
95	120	12	TP_100950	12.4	101	99.4
95	125	12	TP_200950	12.4	101	99.4
100	120	12	TP_101000	12.4	106	104.4
100	125	12	TP_201000	12.4	106	104.4
100	**130**	**12**	**TP_301000**	**12.4**	**106**	**104.4**
105	**130**	**12**	**TP_101050**	**12.4**	**111**	**109.4**
105	140	12	TP_201050	12.4	111	109.4
110	130	12	TP_101100	12.4	116	114.4
110	**140**	**12**	**TP_201100**	**12.4**	**116**	**114.4**
115	140	12	TP_101150	12.4	121	119.4
115	150	12	TP_201150	12.4	121	119.4
120	**150**	**12**	**TP_101200**	**12.4**	**126**	**124.4**
120	160	12	TP_201200	12.4	126	124.4
125	150	12	TP_101250	12.4	131	129.4
125	160	12	TP_201250	12.4	131	129.4

Sizes						
d_1	d_2	b	Part No.	$b_{1\ min.}$	$d_{4\ max.}$	$d_{5\ min.}$
130	**160**	**12**	**TP_101300**	**12.4**	**136**	**134.4**
130	170	12	TP_201300	12.4	136	134.4
135	170	12	TP_101350	12.4	141	139.4
140	170	15	TP_101400	15.4	148	147.0
145	175	15	TP_101450	15.4	153	152.0
150	**180**	**15**	**TP_101500**	**15.4**	**158**	**157.0**
160	190	15	TP_101600	15.4	168	167.0
170	200	15	TP_101700	15.4	178	177.0

The sizes printed in bold type should be preferred.

Other sizes are available on request.

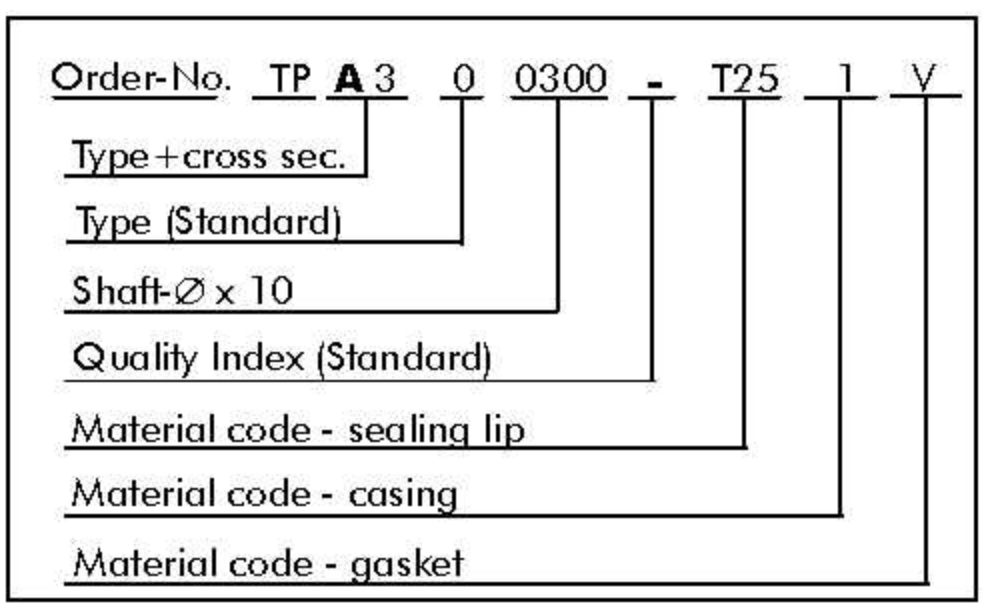
Ordering Example

Varilip®, Type A
Shaft diameter d_1 = 30 mm
Outside diameter d_2 = 47 mm
Width b = 7 mm

Table VII: Part No. TP_300300

The material is selected from Tables II to IV, page 6.

The type is inserted as the 3rd digit.



For other types by analogy:

Order No.: TP **B** 300300 - T 25 1V
TP **C** 300300 - T 25 1V
TP **D** 300300 - T 25 1V