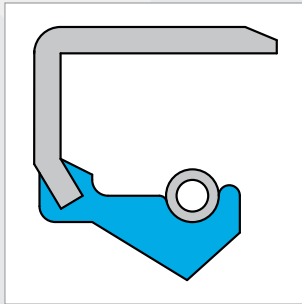




STANDARD SHAFT SEALS

SB2



DESCRIPTION

The SB2 profile is a shaft seal composed of a single external metal cage and a primary sealing lip with integrated spring.

ADVANTAGES

Good radial rigidity, particularly for large diameters

Good stability when assembled, preventing the bounce-back effect

Sealing for low and high viscosity fluids

Modern primary sealing lip with low radial forces

APPLICATIONS

Shaft sealing

Engines

Pumps

Transmissions

MATERIALS

Rubber

ACM 70 - 75 Shore A

EPDM 70 - 75 Shore A

FKM 70 - 75 Shore A

HNBR 70 - 75 Shore A

NBR 70 - 75 Shore A

Metal cage

Steel - AISI 1010

Stainless steel - AISI 304

Stainless steel - AISI 316

Spring

Steel - AISI 1070 - 1090

Stainless steel - AISI 316

SEAL DESIGN

Tolerance for the outside diameter of the seal (ØD)

Bore diameter ØD1 (mm)	Apparent metal cage	Rubber coating	Coating with grooves
ØD1 ≤ 50.0	+0.10 / +0.20	+0.15 / +0.30	+0.20 / +0.40
50.0 < ØD1 ≤ 80.0	+0.13 / +0.23	+0.20 / +0.35	+0.25 / +0.45
80.0 < ØD1 ≤ 120.0	+0.15 / +0.25	+0.20 / +0.35	+0.25 / +0.45
120.0 < ØD1 ≤ 180.0	+0.18 / +0.28	+0.25 / +0.45	+0.30 / +0.55
180.0 < ØD1 ≤ 300.0	+0.20 / +0.30	+0.25 / +0.45	+0.30 / +0.55
300.0 < ØD1 ≤ 500.0	+0.23 / +0.35	+0.30 / +0.55	+0.35 / +0.65
500.0 < ØD1 ≤ 630.0	+0.23 / +0.35	+0.35 / +0.65	+0.40 / +0.75

Roundness tolerance

Bore diameter ØD1 (mm)	Apparent metal cage	Rubber coating
ØD1 ≤ 50.0	0.18	0.25
50.0 < ØD1 ≤ 80.0	0.25	0.35
80.0 < ØD1 ≤ 120.0	0.30	0.50
120.0 < ØD1 ≤ 180.0	0.40	0.65
180.0 < ØD1 ≤ 300.0	0.25% of the outside diameter	0.80
300.0 < ØD1 ≤ 500.0	0.25% of the outside diameter	1.00
500.0 < ØD1 ≤ 630.0	-	-

Tolerance for the inside diameter of the seal (Ød)

Free and without constraint, the inside diameter of the sealing lip is always smaller than the diameter of the shaft. The pre-tightening or interference denotes the difference between these two values. Depending on the shaft diameter, the diameter of the sealing lip is generally considered to be less, between 0.8 and 3.5 mm.

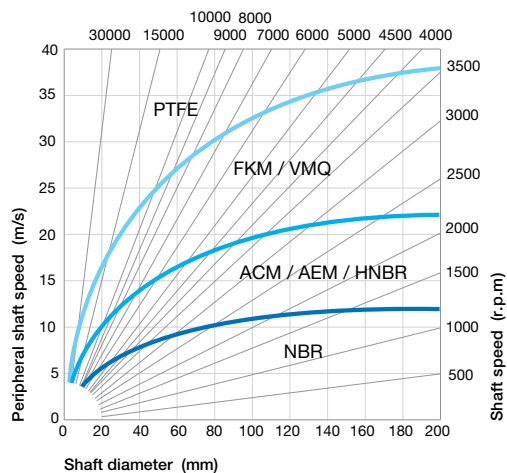
Pumping leads

Clockwise	Anti-clockwise	Bi-directional
R	L	H0

Other types of pumping leads can be created according to your specifications. Please contact our experts.

TECHNICAL DATA

Speed



The shaft seals with an additional protective lip are limited to a speed of 8 m/sec.

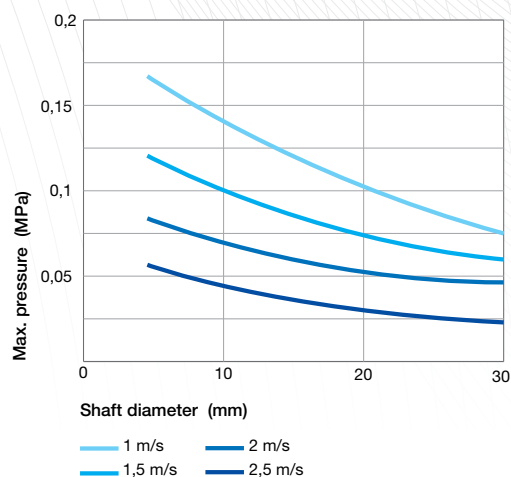
Linear speed calculation:

$$s \text{ (m/s)} = \frac{[\text{shaft } \varnothing \text{ (mm)} \times \text{speed (rpm)} \times \pi]}{60,000}$$

Pressure

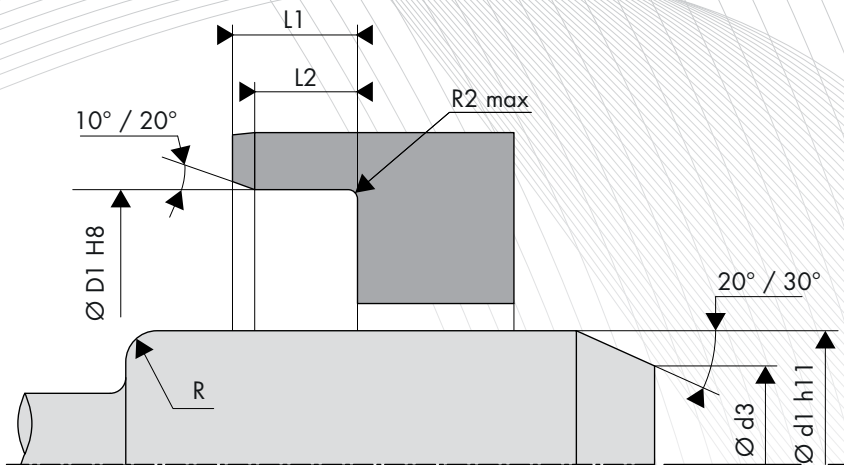
The standard shaft seals are generally used in unpressurised environments, or for pressures between 0.02 and 0.05 MPa maximum.

Higher pressures are acceptable, following testing, for standard NBR or FKM shaft seals used on a shaft diameter less than 30 mm.



Temperature / Media

Media		Maximum temperature depending on the materials						
		ACM	AEM	EPDM	FKM	HNBR	NBR	VMQ
Mineral oils	Oils for motors	+130°C	+130°C	–	+170°C	+130°C	+100°C	+150°C
	Oils for gearboxes	+120°C	+130°C	–	+150°C	+110°C	+80°C	+130°C
	Oils for hypoid gears	+120°C	+130°C	–	+150°C	+110°C	+80°C	–
	ATF oils	+120°C	+130°C	–	+170°C	+130°C	+100°C	–
	Hydraulic oils	+120°C	+130°C	–	+150°C	+130°C	+90°C	–
	Greases	–	+130°C	–	–	+100°C	+90°C	–
Fire-resistant fluids	HFA group - Emulsion with more than 80% water	–	–	–	–	+70°C	+70°C	+60°C
	HFB group - Opposite solution (water in oil)	–	–	–	–	+70°C	+70°C	+60°C
	HFC group - Polymer aqueous solution	–	–	+60°C	–	+70°C	+70°C	–
	HFD group - Water-free synthetic fluids	–	–	–	+150°C	–	–	–
Other fluids	EL + L heating oil	–	–	–	–	+100°C	+90°C	–
	Air	+150°C	+150°C	+150°C	+200°C	+130°C	+100°C	+200°C
	Water	–	–	+150°C	+100°C	+100°C	+90°C	–
	Water for washing	–	–	+130°C	+100°C	+100°C	+90°C	–
Temperature range	Min.	-25°C	-40°C	-45°C	-20°C	-30°C	-30°C	-60°C
	Max.	+150°C	+150°C	+150°C	+200°C	+150°C	+100°C	+200°C



SHAFT DESIGN

Shaft hardness

Rotation speed	Hardness in HRC
$s \leq 4.0 \text{ m/sec}$	45 HRC
$4.0 < s \leq 10.0 \text{ m/s}$	55 HRC
$s > 10.0 \text{ m/sec}$	60 HRC

Surface roughness

Ra *	0.2 to 0.8 μm
Rz	1.0 to 4.0 μm
Rmax	$\leq 6.3 \mu\text{m}$

*Ra = 0.1 μm for demanding applications

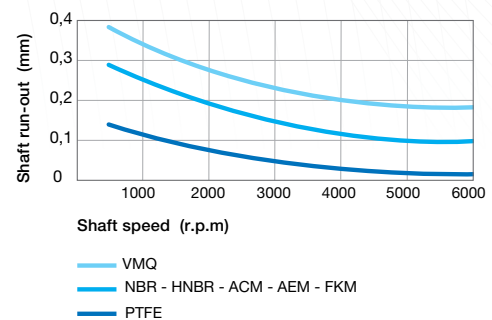
Shaft tolerance

Shaft diameter $\varnothing d1$ (mm)	Tolerance $h11$ (mm)
$\varnothing d1 \leq 3.0$	-0.060 / 0
$3.0 < \varnothing d1 \leq 6.0$	-0.075 / 0
$6.0 < \varnothing d1 \leq 10.0$	-0.090 / 0
$10.0 < \varnothing d1 \leq 18.0$	-0.110 / 0
$18.0 < \varnothing d1 \leq 30.0$	-0.130 / 0
$30.0 < \varnothing d1 \leq 50.0$	-0.160 / 0
$50.0 < \varnothing d1 \leq 80.0$	-0.190 / 0
$80.0 < \varnothing d1 \leq 120.0$	-0.220 / 0
$120.0 < \varnothing d1 \leq 180.0$	-0.250 / 0
$180.0 < \varnothing d1 \leq 250.0$	-0.290 / 0
$250.0 < \varnothing d1 \leq 315.0$	-0.320 / 0
$315.0 < \varnothing d1 \leq 400.0$	-0.360 / 0
$400.0 < \varnothing d1 \leq 500.0$	-0.400 / 0

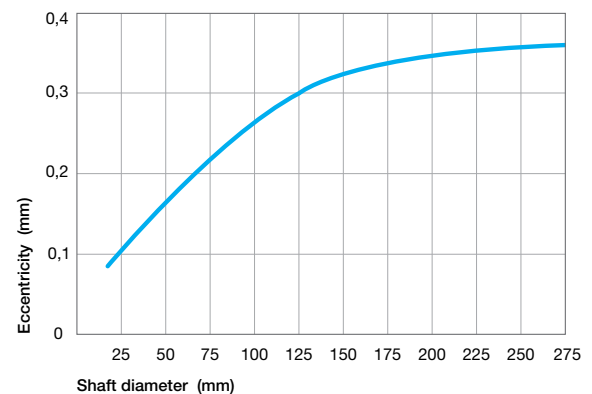
Chamfer and radius

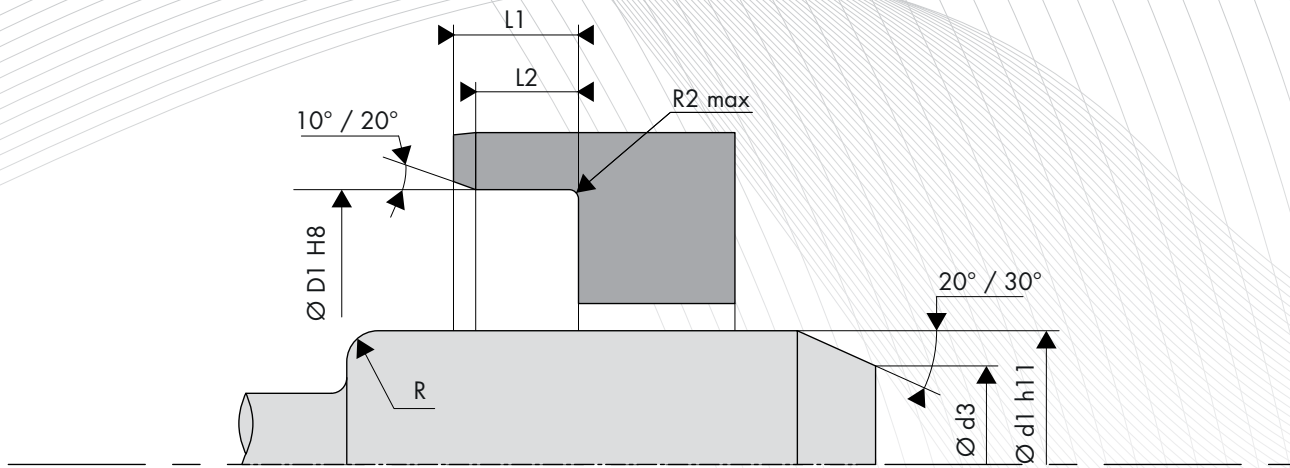
Shaft diameter $\varnothing d1$ (mm)	Chamfer diameter $\varnothing d3$ (mm)	Radius R (mm)
$\varnothing d1 \leq 10.0$	$\varnothing d1 - 1.50$	2.00
$10.0 < \varnothing d1 \leq 20.0$	$\varnothing d1 - 2.00$	2.00
$20.0 < \varnothing d1 \leq 30.0$	$\varnothing d1 - 2.50$	3.00
$30.0 < \varnothing d1 \leq 40.0$	$\varnothing d1 - 3.00$	3.00
$40.0 < \varnothing d1 \leq 50.0$	$\varnothing d1 - 3.50$	4.00
$50.0 < \varnothing d1 \leq 70.0$	$\varnothing d1 - 4.00$	4.00
$70.0 < \varnothing d1 \leq 95.0$	$\varnothing d1 - 4.50$	5.00
$95.0 < \varnothing d1 \leq 130.0$	$\varnothing d1 - 5.50$	6.00
$130.0 < \varnothing d1 \leq 240.0$	$\varnothing d1 - 7.00$	8.00
$240.0 < \varnothing d1 \leq 500.0$	$\varnothing d1 - 11.00$	12.00

Shaft run out



Eccentricity





HOUSING DESIGN

Surface roughness

Ra	0.8 to 3.2 μm
Rz	6.3 to 16.0 μm
Rmax	$\leq 16.0 \mu\text{m}$

Housing tolerance

Bore diameter $\varnothing D1$ (mm)	Tolerance H8 (mm)
$3.0 < \varnothing D1 \leq 6.0$	0 / +0.018
$6.0 < \varnothing D1 \leq 10.0$	0 / +0.022
$10.0 < \varnothing D1 \leq 18.0$	0 / +0.027
$18.0 < \varnothing D1 \leq 30.0$	0 / +0.033
$30.0 < \varnothing D1 \leq 50.0$	0 / +0.039
$50.0 < \varnothing D1 \leq 80.0$	0 / +0.046
$80.0 < \varnothing D1 \leq 120.0$	0 / +0.054
$120.0 < \varnothing D1 \leq 180.0$	0 / +0.063
$180.0 < \varnothing D1 \leq 250.0$	0 / +0.072
$250.0 < \varnothing D1 \leq 315.0$	0 / +0.081
$315.0 < \varnothing D1 \leq 400.0$	0 / +0.089
$400.0 < \varnothing D1 \leq 500.0$	0 / +0.097
$500.0 < \varnothing D1 \leq 630.0$	0 / +0.110

Housing radius and width

Height H1 (mm)	Width		Radius R2 max (mm)
	L2min (H1 x 0.85)	L1min (H1 x +0.3)	
7.00	5.95	7.30	0.50
8.00	6.80	8.30	
10.00	8.50	10.30	
12.00	10.30	12.30	
15.00	12.75	15.30	0.70
20.00	17.00	20.30	

DIMENSIONS

Part number	Shaft diameter Ød1 h11	Bore diameter ØD1 H8	Seal height H1
SB2 12 x 25 x 5	12.00	25.00	5.00
SB2 12 x 28 x 7	12.00	28.00	7.00
SB2 12 x 32 x 6	12.00	32.00	6.00
SB2 12 x 32 x 7	12.00	32.00	7.00
SB2 13 x 28 x 7	13.00	28.00	7.00
SB2 14 x 28 x 7	14.00	28.00	7.00
SB2 15 x 22 x 4	15.00	22.00	4.00
SB2 15 x 26 x 7	15.00	26.00	7.00
SB2 15 x 30 x 7	15.00	30.00	7.00
SB2 15 x 35 x 5	15.00	35.00	5.00
SB2 15 x 35 x 7	15.00	35.00	7.00
SB2 16 x 30 x 6.4	16.00	30.00	6.40
SB2 17 x 28 x 6	17.00	28.00	6.00
SB2 17 x 30 x 7	17.00	30.00	7.00
SB2 17 x 33 x 7	17.00	33.00	7.00
SB2 17 x 33 x 8	17.00	33.00	8.00
SB2 17 x 35 x 7	17.00	35.00	7.00
SB2 17 x 35 x 8	17.00	35.00	8.00
SB2 17 x 40 x 10	17.00	40.00	10.00
SB2 19 x 37 x 10	19.00	37.00	10.00
SB2 20 x 35 x 7	20.00	35.00	7.00
SB2 20 x 40 x 7	20.00	40.00	7.00
SB2 20 x 40 x 10	20.00	40.00	10.00
SB2 20 x 42 x 7	20.00	42.00	7.00
SB2 20 x 47 x 7	20.00	47.00	7.00
SB2 22 x 32 x 7	22.00	32.00	7.00
SB2 22 x 35 x 7	22.00	35.00	7.00
SB2 22 x 36 x 10	22.00	36.00	10.00
SB2 22 x 40 x 7	22.00	40.00	7.00
SB2 22 x 42 x 10	22.00	42.00	10.00
SB2 25 x 35 x 7	25.00	35.00	7.00
SB2 25 x 36 x 7.3	25.00	36.00	7.30
SB2 25 x 40 x 7	25.00	40.00	7.00
SB2 25 x 40 x 10	25.00	40.00	10.00
SB2 25 x 42 x 8	25.00	42.00	8.00
SB2 25 x 45 x 10	25.00	45.00	10.00
SB2 25 x 48 x 8	25.00	48.00	8.00
SB2 25 x 52 x 12	25.00	52.00	12.00
SB2 26 x 42 x 8	26.00	42.00	8.00
SB2 27 x 52 x 8	27.00	52.00	8.00
SB2 28 x 43 x 10	28.00	43.00	10.00
SB2 28 x 47 x 8	28.00	47.00	8.00
SB2 28 x 47 x 10	28.00	47.00	10.00
SB2 28 x 48 x 11	28.00	48.00	11.00
SB2 29 x 45 x 10	29.00	45.00	10.00
SB2 30 x 42 x 7	30.00	42.00	7.00
SB2 30 x 43 x 8	30.00	43.00	8.00
SB2 30 x 45 x 7	30.00	45.00	7.00
SB2 30 x 45 x 8	30.00	45.00	8.00
SB2 30 x 47 x 6.5	30.00	47.00	6.50
SB2 30 x 47 x 7	30.00	47.00	7.00
SB2 30 x 47 x 8	30.00	47.00	8.00
SB2 30 x 50 x 11	30.00	50.00	11.00
SB2 30 x 50 x 12	30.00	50.00	12.00
SB2 30 x 52 x 7	30.00	52.00	7.00
SB2 30 x 52 x 8	30.00	52.00	8.00
SB2 30 x 55 x 12	30.00	55.00	12.00
SB2 30 x 62 x 10	30.00	62.00	10.00
SB2 32 x 46 x 8	32.00	46.00	8.00
SB2 32 x 48 x 8	32.00	48.00	8.00
SB2 34 x 46 x 8	34.00	46.00	8.00
SB2 34 x 48 x 8	34.00	48.00	8.00

Part number	Shaft diameter Ød1 h11	Bore diameter ØD1 H8	Seal height H1
SB2 34 x 52 x 10	34.00	52.00	10.00
SB2 35 x 50 x 10	35.00	50.00	10.00
SB2 35 x 52 x 6	35.00	52.00	6.00
SB2 35 x 52 x 7	35.00	52.00	7.00
SB2 35 x 52 x 8.8	35.00	52.00	8.80
SB2 35 x 55 x 12	35.00	55.00	12.00
SB2 35 x 56 x 8	35.00	56.00	8.00
SB2 35 x 56 x 12	35.00	56.00	12.00
SB2 35 x 57 x 8	35.00	57.00	8.00
SB2 35 x 62 x 10	35.00	62.00	10.00
SB2 35 x 80 x 8	35.00	80.00	8.00
SB2 35 x 85 x 10	35.00	85.00	10.00
SB2 36 x 68 x 8	36.00	68.00	8.00
SB2 38 x 50 x 7	38.00	50.00	7.00
SB2 38 x 52 x 10	38.00	52.00	10.00
SB2 38 x 90 x 8	38.00	90.00	8.00
SB2 40 x 54 x 8	40.00	54.00	8.00
SB2 40 x 56 x 7	40.00	56.00	7.00
SB2 40 x 62 x 10	40.00	62.00	10.00
SB2 40 x 65 x 9	40.00	65.00	9.00
SB2 40 x 66 x 6	40.00	66.00	6.00
SB2 40 x 68 x 8	40.00	68.00	8.00
SB2 40 x 75 x 8	40.00	75.00	8.00
SB2 40 x 90 x 8	40.00	90.00	8.00
SB2 41 x 65 x 9	41.00	65.00	9.00
SB2 42 x 55 x 9	42.00	55.00	9.00
SB2 42 x 60 x 9	42.00	60.00	9.00
SB2 42 x 62 x 6.5	42.00	62.00	6.50
SB2 42 x 62 x 8	42.00	62.00	8.00
SB2 42 x 65 x 12	42.00	65.00	12.00
SB2 42 x 72 x 10	42.00	72.00	10.00
SB2 43 x 60 x 8	43.00	60.00	8.00
SB2 44 x 56 x 7	44.00	56.00	7.00
SB2 44 x 58 x 7	44.00	58.00	7.00
SB2 44 x 65 x 8	44.00	65.00	8.00
SB2 44 x 80 x 12	44.00	80.00	12.00
SB2 45 x 55 x 7	45.00	55.00	7.00
SB2 45 x 60 x 8	45.00	60.00	8.00
SB2 45 x 64 x 12	45.00	64.00	12.00
SB2 45 x 65 x 9	45.00	65.00	9.00
SB2 45 x 68 x 12	45.00	68.00	12.00
SB2 45 x 85 x 8	45.00	85.00	8.00
SB2 47 x 62 x 9	47.00	62.00	9.00
SB2 48 x 62 x 8	48.00	62.00	8.00
SB2 48 x 70 x 12	48.00	70.00	12.00
SB2 48 x 82 x 8	48.00	82.00	8.00
SB2 48 x 90 x 8	48.00	90.00	8.00
SB2 50 x 72 x 9	50.00	72.00	9.00
SB2 50 x 72 x 12	50.00	72.00	12.00
SB2 50 x 80 x 8	50.00	80.00	8.00
SB2 50 x 80 x 10	50.00	80.00	10.00
SB2 52 x 70 x 9	52.00	70.00	9.00
SB2 52 x 75 x 12	52.00	75.00	12.00
SB2 53 x 68 x 10	53.00	68.00	10.00
SB2 54 x 65 x 8	54.00	65.00	8.00
SB2 55 x 75 x 8	55.00	75.00	8.00
SB2 55 x 76 x 12	55.00	76.00	12.00
SB2 55 x 78 x 12	55.00	78.00	12.00
SB2 55 x 80 x 10	55.00	80.00	10.00
SB2 55 x 90 x 10	55.00	90.00	10.00
SB2 55 x 100 x 8	55.00	100.00	8.00
SB2 56 x 75 x 8	56.00	75.00	8.00

Part number	Shaft diameter Ød1 h11	Bore diameter ØD1 H8	Seal height H1
SB2 57 x 70 x 7.5	57.00	70.00	7.50
SB2 58 x 80 x 12	58.00	80.00	12.00
SB2 60 x 82 x 12	60.00	82.00	12.00
SB2 60 x 90 x 10	60.00	90.00	10.00
SB2 62 x 85 x 12	62.00	85.00	12.00
SB2 65 x 77 x 7.5	65.00	77.00	7.50
SB2 65 x 90 x 10	65.00	90.00	10.00
SB2 65 x 90 x 13	65.00	90.00	13.00
SB2 68 x 85 x 10	68.00	85.00	10.00
SB2 68 x 90 x 8.4	68.00	90.00	8.40
SB2 68 x 90 x 10	68.00	90.00	10.00
SB2 68 x 90 x 13	68.00	90.00	13.00
SB2 68 x 95 x 13	68.00	95.00	13.00
SB2 70 x 90 x 10	70.00	90.00	10.00
SB2 70 x 95 x 13	70.00	95.00	13.00
SB2 70 x 100 x 13	70.00	100.00	13.00
SB2 70 x 105 x 10	70.00	105.00	10.00
SB2 72 x 88 x 8	72.00	88.00	8.00
SB2 75 x 95 x 9.5	75.00	95.00	9.50
SB2 75 x 100 x 10	75.00	100.00	10.00
SB2 75 x 100 x 13	75.00	100.00	13.00
SB2 80 x 100 x 10	80.00	100.00	10.00

Part number	Shaft diameter Ød1 h11	Bore diameter ØD1 H8	Seal height H1
SB2 80 x 100 x 13	80.00	100.00	13.00
SB2 80 x 105 x 13	80.00	105.00	13.00
SB2 85 x 105 x 10	85.00	105.00	10.00
SB2 85 x 105 x 12	85.00	105.00	12.00
SB2 85 x 105 x 15	85.00	105.00	15.00
SB2 85 x 110 x 13	85.00	110.00	13.00
SB2 90 x 115 x 13	90.00	115.00	13.00
SB2 94 x 114 x 5	94.00	114.00	5.00
SB2 94 x 114 x 7	94.00	114.00	7.00
SB2 95 x 115 x 10	95.00	115.00	10.00
SB2 95 x 120 x 13	95.00	120.00	13.00
SB2 100 x 120 x 8	100.00	120.00	8.00
SB2 100 x 125 x 13	100.00	125.00	13.00
SB2 100 x 130 x 12	100.00	130.00	12.00
SB2 105 x 135 x 14	105.00	135.00	14.00
SB2 115 x 140 x 13	115.00	140.00	13.00
SB2 115 x 145 x 14	115.00	145.00	14.00
SB2 120 x 150 x 14	120.00	150.00	14.00
SB2 130 x 160 x 12	130.00	160.00	12.00
SB2 140 x 170 x 14	140.00	170.00	14.00
SB2 160 x 190 x 16	160.00	190.00	16.00