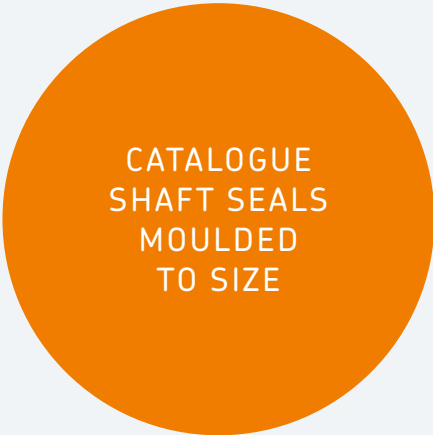


Reinforced shaft seals

Catalogue radial shaft seals for heavy duty industrial applications



Radial shaft seals for heavy industrial applications



Rubber fabric seals

All rubber seals

Rubber fabric seals

Rubber metal seals

Metal-cased rubber seals

Rubber metal seals

Machined seals

Machined seals



Foreword

From catalogue to engineered solutions

SKF created a complete Heavy Industrial Seals (HIS) offer to meet our customer needs. This brochure provides an overview on SKF catalogue heavy industrial shaft seals. The brochure is a guide to seal selection. It provides an introduction to the most important factors to be considered.

The catalogue seal offer has been expanded by complementary offers with size flexibility, customization and engineering services.

Catalogue seals and expanded offer

- HIS flexible in size
- Express service
- Engineered solutions

Catalogue seals for easy retrofit

Catalogue shaft seals moulded to size are manufactured in an efficient moulding process for mid and higher volumes. Please refer to the enclosed size tables in this catalogue. On request SKF tools up additional sizes.

Express service with flexible manufacturing processes

Catalogue shaft seals flexible in size are available in customized main dimensions with minimum order quantity of just one seal and optional express service. Please refer to shaft seals flexible in size.

Engineering service to exceed limits in extreme conditions

Engineered solutions application specific demands are relevant where operating parameters are exceeding the limits of catalogue seals. Please refer to engineered solutions.

SKF heavy industrial seals

- Availability, matching your needs schedule and express service
- Unlimited size range, not limited to listed catalogue part numbers
- Fast and simple installation, reduces risk of failure and resulting downtime
- Highly flexible design options, configured to your requirements
- Improve rotating equipment performance

Heavy duty industrial applications, like in construction equipment, metal, mining, paper, oil drilling or wind turbines can be very challenging for radial shaft seals. In operation, the seals are exposed to a wide range of temperatures, speeds and abrasive contaminants. Besides their generally sturdy designs and often large size, seals for these applications come with some special features to help improve seal performance, reliability and handling.

Typical applications

- Steel and aluminium rolling
- Pulp and paper feeders and paper machine wet section
- Mining and cement machinery
- Traditional energy – coal grinding mills
- Wind turbines
- Tunnel boring machines
- Heavy duty gearboxes
- Special purpose machinery
- Construction machinery

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Designed to the
toughest operating
conditions



Catalogue shaft seals moulded to size

Catalogue shaft seals moulded to size are manufactured in an efficient moulding process for mid and higher volumes. Typical applications in rough environment in heavy duty operations for large machinery.

Table 1	
Seal capabilities	
Size	from 25 to 2 350 mm (from 0.98 to 92.52 in.)
Pressure	max. 0,5 bar (max. 7.25 psi)
TIR	max. ± 1,025 mm (max. ± 0.04 in.)
Speed	max. 25 m/s (max. 4 900 ft/min)
Temperature	from -25 to +200 °C (from -13 to +392 °F)
Materials	NBR HNBR FKM

Selection criteria are the internal and external application environment, seal housing designs and the operating parameters such as media, rotating speed, DRO (Dynamic runout) and mis-alignment, operating temperature and pressure. For the seal-system performance it is important to have the right seal, seal counterface conditions, effective lubrication and installation procedures.

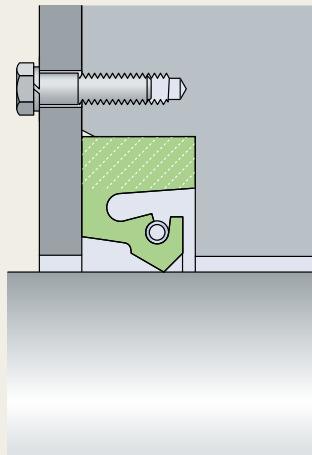
Shaft seals – moulded to size by SKF is a range of seal designs for easy retrofit. The size tables include a selection of available sizes. On request SKF tools up additional sizes. For seals with full size flexibility and express service – even for just one seal – please refer to **page 54** *catalogue shaft seals flexible in size*.

For seals with capabilities exceeding the limits (→ **table 1**) or special customer requirements please refer to *engineered solutions application specific* on **page 56**.

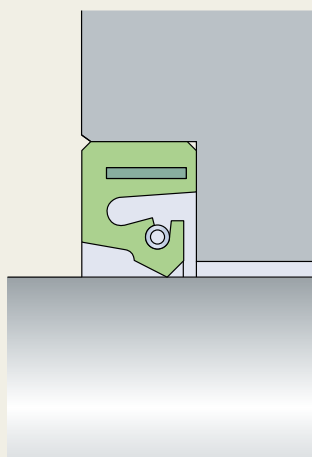


Seal selection

The most important factors to consider for seal selection are:



Housing with cover plate, seal axially clamped



Open housing, seal self-retaining

1. Seal housing designs

The two common housing designs determine the seal selection. Housings with cover plate ensure proper stability by axial clamping for rubber fabric seals. Open housings require a metal reinforced self-retaining seal.

Rubber fabric reinforced (solid + split)

The fabric reinforced rubber seals are available in solid and split executions. The seals are finished oversized to the housing bore to allow proper compression and stability. A cover plate is required to compress the seal within the housing, helping to stabilize the seal. The split seal execution allows seal replacement without shaft removal or dismounting of other machine components.

Rubber metal reinforced

The seals are self-retaining in open housing bores without the use of a cover plate. The metal reinforcement provides the required stability in the housing bore. The L-shape metal reinforcement further increases seal stability e.g. in case of vibrations in the system.

2. Lip features

A garter or finger spring provides the appropriate radial load against the shaft. To avoid the potential risk of losing a spring in blind installations SKF seals feature an optional moulded-in garter spring or the finger spring execution.

3. Re-lubrication features

All seals of the range can be equipped with lubrication grooves at the back of the seal to allow the re-greasing between the sealing lips in back-to-back or tandem installations of two seals. For metal reinforced seals spacer lugs in customized dimensions are available on request.

4. Auxiliary lip

The auxiliary lip on radial shaft seals is an optional feature for increased protection against contaminants. Auxiliary lips are meant for applications in slightly contaminated environment. In an environment with heavy contamination an additional seal with excluding function is highly recommended.

5. Main lip materials

Material selection has a significant impact on seal performance and reliability. Important material properties are resistance to swelling, elasticity, chemical resistance, thermal resistance and low temperature behaviour. Seals are available in nitrile rubber (NBR), hydrogenated nitrile rubber (HNBR) and fluoro rubber (FKM).

The recommended maximum rotating speed for a seal is linked to the thermal resistance of the sealing lip material. Radial force and friction causes elevated temperatures under the sealing lip, which may require increased thermal resistance of the sealing material.

Details about the chemical resistance of the sealing material against the various media can be found in the section "chemical resistance" of SKF publication "10919-Industrial shaft seals".

NBR is a general purpose sealing material with good resistance to most mineral oils and greases, normal fuels such as gasoline, diesel and light heating oils, animal and vegetable oils and hot water. The permissible operating temperature range is +30 to +100 °C (+22 to +210 °F) for brief periods temperatures of up to +120 °C (+250 °F) can be tolerated.

HNBR combines increased wear resistance with increased high-temperature resistance. HNBR additionally features increased resistance to chemical attack, weather, ageing and ozone. Mixtures of oil in air may have a negative effect. The upper operating temperature limit is +150 °C (+300 °F).

FKM features a very good thermal and chemical resistance with very good ageing, weather, UV light and ozone resistance. The upper operating temperature limit is +200 °C (+390 °F).



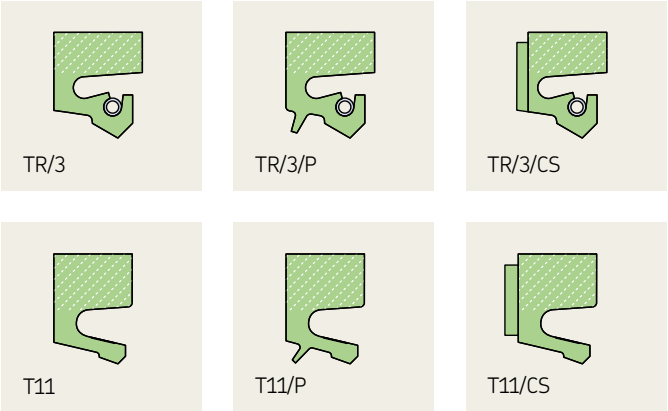
Rubber fabric reinforced (solid + split), seal axially clamped



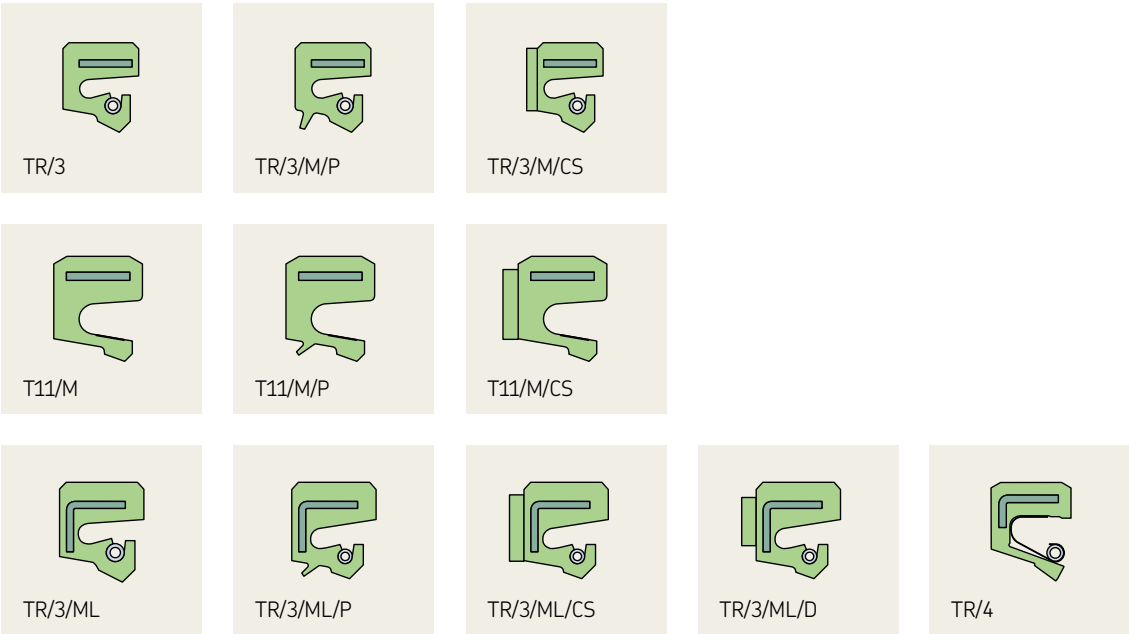
Rubber metal reinforced, self retaining seal with auxiliary lip

Design overview

Tenute seals – rubber fabric reinforced



Tenute seals – rubber metal reinforced



Operating parameters								
Material Seal	Temperature				Pressure		Rotating speed	
	from	to	from	to	max.		max.	
	°C		°F		MPa	psi	m/s	ft/min
NBR	−25	+100	−13	+212	0,05	7.25	15	2 950
HNBR	−25	+150	−13	+302	0,05	7.25	20	3 950
FKM	−15	+200	−5	+392	0,05	7.25	25	4 900

High pressure and high speed seals are available as engineered solutions

Seal design options

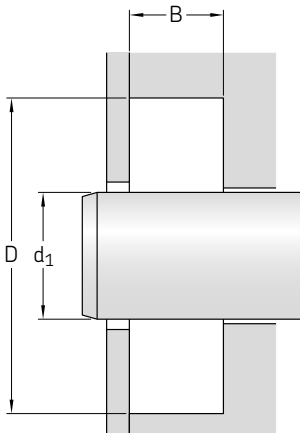
Seal	Feature	Design code
Main seal construction	Fabric split	SPL
	Metal band	M
	L shap metal band	ML
Main lip features	No spring	WS
	Garter spring – moulded-in	VGD
Re-lub features	Lub groove	CS
	Lugs	D
Auxiliary lip	Dust lip	P
Main lip material	NBR (R)	R
	HNBR (H)	H
	FKM (V)	V

Designation examples metric and imperial

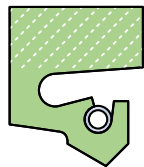
50x75x10 TR/3/P V The metric seal designation shows the dimensions, the seal design and the material.	208-316-32 TR/3/P R Inch dimensions are coded and separated with an hyphen. See product tables at the following pages.
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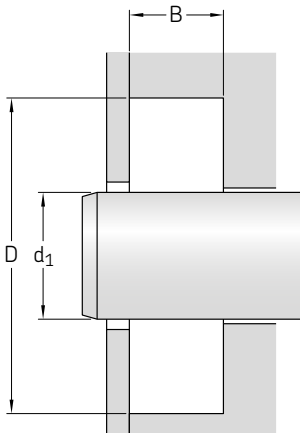
The size tables include a selection of available sizes. **On request SKF tools up additional sizes.** For seals with full size flexibility and express service – even for just one seal – refer to **page 54 catalogue shaft seals flexible in size.**



Dimensions			Dimensions			Mate- rial	SKF Designation
d ₁	D	B	d ₁	D	B		
mm			in.				
195,26	234,94	15,88	7.688	9.250	0.625	NBR	744-916-40 TR/3 R
						HNBR	744-916-40 TR/3 H
						FKM	744-916-40 TR/3 V
196,85	238,12	15,88	7.750	9.375	0.625	NBR	748-924-40 TR/3 R
						HNBR	748-924-40 TR/3 H
						FKM	748-924-40 TR/3 V
197	236	16	7.756	9.291	0.63	NBR	197x236x16 TR/3 R
						HNBR	197x236x16 TR/3 H
						FKM	197x236x16 TR/3 V
200	225	15	7.874	8.858	0.591	NBR	200x225x15 TR/3 R
						HNBR	200x225x15 TR/3 H
						FKM	200x225x15 TR/3 V
200	230	16	7.874	9.055	0.63	NBR	200x230x16 TR/3 R
						HNBR	200x230x16 TR/3 H
						FKM	200x230x16 TR/3 V
200	231,74	15,88	7.875	9.125	0.625	NBR	756-908-40 TR/3 R
						HNBR	756-908-40 TR/3 H
						FKM	756-908-40 TR/3 V
200	238	19	7.874	9.370	0.748	NBR	200x238x19 TR/3 R
						HNBR	200x238x19 TR/3 H
						FKM	200x238x19 TR/3 V
200	238,1	18	7.874	9.375	0.709	NBR	200x238,1x18 TR/3 R
						HNBR	200x238,1x18 TR/3 H
						FKM	200x238,1x18 TR/3 V
200	240	16	7.874	9.449	0.63	NBR	200x240x16 TR/3 R
						HNBR	200x240x16 TR/3 H



The size tables include a selection of available sizes. **On request SKF tools up additional sizes.** For seals with full size flexibility and express service – even for just one seal – refer to **page 54 catalogue shaft seals flexible in size.**



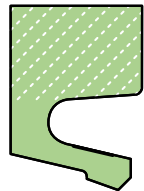
Dimensions			Dimensions			Mate- rial	SKF Designation
d ₁	D	B	d ₁	D	B		
mm			in.				
1 310	1 374	25	51.575	54.094	0.984	NBR	1310x1374x25 TR/3 R
						HNBR	1310x1374x25 TR/3 H
						FKM	1310x1374x25 TR/3 V
1 320	1 370	20	51.969	53.937	0.787	NBR	1320x1370x20 TR/3 R
						HNBR	1320x1370x20 TR/3 H
						FKM	1320x1370x20 TR/3 V
1 330	1 394	25	52.362	54.882	0.984	NBR	1330x1394x25 TR/3 R
						HNBR	1330x1394x25 TR/3 H
						FKM	1330x1394x25 TR/3 V
1 385	1 435	25	54.528	56.496	0.984	NBR	1385x1435x25 TR/3 R
						HNBR	1385x1435x25 TR/3 H
						FKM	1385x1435x25 TR/3 V
1 435	1 499	25	56.496	59.016	0.984	NBR	1435x1499x25 TR/3 R
						HNBR	1435x1499x25 TR/3 H
						FKM	1435x1499x25 TR/3 V
1 447,8	1 524	19,1	57.000	60.000	0.75	NBR	5700-6000-48 TR/3 R
						HNBR	5700-6000-48 TR/3 H
						FKM	5700-6000-48 TR/3 V
1 550	1 614	25	61.024	63.543	0.984	NBR	1550x1614x25 TR/3 R
						HNBR	1550x1614x25 TR/3 H
						FKM	1550x1614x25 TR/3 V
1 556	1 620	25	61.260	63.780	0.984	NBR	1556x1620x25 TR/3 R
						HNBR	1556x1620x25 TR/3 H
						FKM	1556x1620x25 TR/3 V
1 600	1 664	25,3	62.992	65.512	0.996	NBR	1600x1664x25,3 TR/3 R
						HNBR	1600x1664x25,3 TR/3 H
						FKM	1600x1664x25,3 TR/3 V
1 610	1 660	20	63.386	65.354	0.787	NBR	1610x1660x20 TR/3 R
						HNBR	1610x1660x20 TR/3 H
						FKM	1610x1660x20 TR/3 V
1 610	1 670	20	63.386	65.748	0.787	NBR	1610x1670x20 TR/3 R
						HNBR	1610x1670x20 TR/3 H
						FKM	1610x1670x20 TR/3 V
1 620	1 684	25	63.780	66.299	0.984	NBR	1620x1684x25 TR/3 R
						HNBR	1620x1684x25 TR/3 H
						FKM	1620x1684x25 TR/3 V

Dimensions			Dimensions			Mate- rial	SKF Designation
d ₁	D	B	d ₁	D	B		
mm			in.				

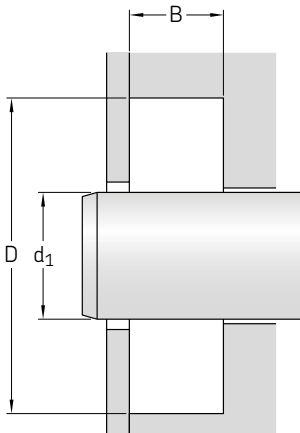
Dimensions			Dimensions			Mate- rial	SKF Designation
d ₁	D	B	d ₁	D	B		
mm			in.				
1 656	1 720	25	65.197	67.717	0.984	NBR	1656x1720x25 TR/3 R
						HNBR	1656x1720x25 TR/3 H
						FKM	1656x1720x25 TR/3 V
2 350	2 414	25	92.520	95.039	0.984	NBR	2350x2414x25 TR/3 R
						HNBR	2350x2414x25 TR/3 H
						FKM	2350x2414x25 TR/3 V

T11 seals – rubber fabric reinforced

d₁ 580–1 163 mm



The size tables include a selection of available sizes. **On request SKF tools up additional sizes.** For seals with full size flexibility and express service – even for just one seal – refer to **page 54 catalogue shaft seals flexible in size.**



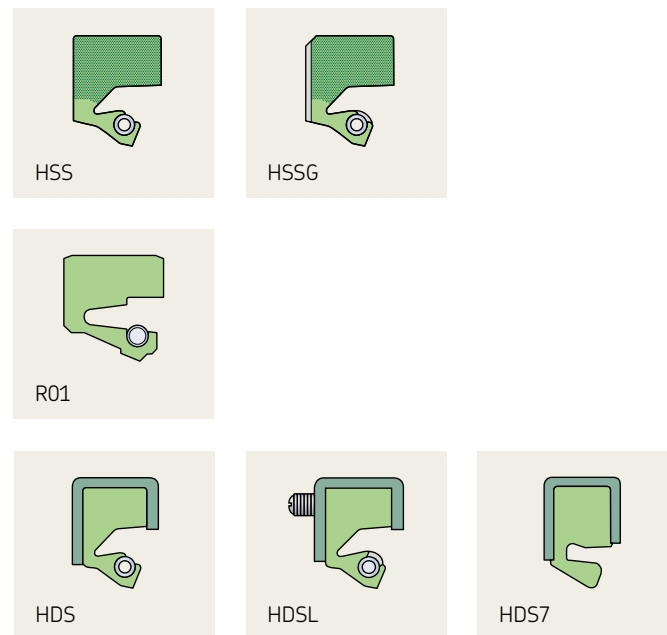
Dimensions			Dimensions			Mate- rial	SKF Designation
d ₁	D	B	d ₁	D	B		
mm			in.				
580	615	20	22.835	24.213	0.787	NBR	580x615x20 T11 R
						HNBR	580x615x20 T11 H
						FKM	580x615x20 T11 V
609,6	673,1	25,4	24.000	26.500	1.000	NBR	2400-2632-64 T11 R
						HNBR	2400-2632-64 T11 H
						FKM	2400-2632-64 T11 V
640	700	25	25.197	27.559	0.984	NBR	640x700x25 T11 R
						HNBR	640x700x25 T11 H
						FKM	640x700x25 T11 V
670	710	20	26.378	27.953	0.787	NBR	670x710x20 T11 R
						HNBR	670x710x20 T11 H
						FKM	670x710x20 T11 V
707,3	758,0	22,2	27.844	29.844	0.875	NBR	2754-2954-56 T11 R
						HNBR	2754-2954-56 T11 H
						FKM	2754-2954-56 T11 V
720	770	20	28.346	30.315	0.787	NBR	720x770x20 T11 R
						HNBR	720x770x20 T11 H
						FKM	720x770x20 T11 V
745	795	30	29.331	31.299	1.181	NBR	745x795x30 T11 R
						HNBR	745x795x30 T11 H
						FKM	745x795x30 T11 V
750	800	22	29.528	31.496	0.866	NBR	750x800x22 T11 R
						HNBR	750x800x22 T11 H
						FKM	750x800x22 T11 V
850	910	25	33.465	35.827	0.984	NBR	850x910x25 T11 R
						HNBR	850x910x25 T11 H
						FKM	850x910x25 T11 V
860	910	22	33.858	35.827	0.866	NBR	860x910x22 T11 R
						HNBR	860x910x22 T11 H
						FKM	860x910x22 T11 V
920	970	20	36.220	38.189	0.787	NBR	920x970x20 T11 R
						HNBR	920x970x20 T11 H
						FKM	920x970x20 T11 V
980	1 054	25	38.583	41.496	0.984	NBR	980x1054x25 T11 R
						HNBR	980x1054x25 T11 H
						FKM	980x1054x25 T11 V

Dimensions			Dimensions			Mate- rial	SKF Designation
d ₁	D	B	d ₁	D	B		
mm			in.				
990	1 054	25	38.976	41.496	0.984	NBR	990x1054x25 T11 R
						HNBR	990x1054x25 T11 H
						FKM	990x1054x25 T11 V
1 054,1	1 104,9	22,2	41.500	43.500	0.875	NBR	4132-4332-56 T11 R
						HNBR	4132-4332-56 T11 H
						FKM	4132-4332-56 T11 V
1 064	1 124	25	41.890	44.252	0.984	NBR	1064x1124x25 T11 R
						HNBR	1064x1124x25 T11 H
						FKM	1064x1124x25 T11 V
1 163	1 225	25	45.787	48.228	0.984	NBR	1163x1225x25 T11 R
						HNBR	1163x1225x25 T11 H
						FKM	1163x1225x25 T11 V



Catalogue shaft seals flexible in size

The catalogue seal offer with the highest availability in customized dimensions



HSS, R01 and HDS seals

These SKF seals are manufactured in flexible sizing processes.

The highest flexibility for customized main dimensions is available with minimum order quantity of one seal only, even for a new size.

Innovative manufacturing processes do not require moulds and machine set up enabling optional express service.

The assortment includes heavy duty all rubber seals and metal cased rubber seals in NBR, HNBR and FKM.

Seal design and material selection follows the same criteria as for the *catalogue shaft seals moulded to size*.

Seal design options

All rubber seals (solid + split)

The all rubber seals HS, HSS and R01 are available in solid and split executions. The seals are finished oversized to the housing bore. A cover plate is required to ensure proper compression and stability within the housing. The optional split seal execution allows seal replacement without shaft removal or dismounting of other machine components.

HSS features an all rubber reinforcement of the outer diameter further stabilizing the seal in the housing bore. Lubrication grooves at the back of the seal are optional to allow the re-greasing between the sealing lips in back-to-back or tandem installations of two seals.

R01 is a machined seal available from local manufacturing in many countries around the globe. R01 features an optional auxiliary lip for contamination exclusion.

Metal cased rubber seals

The seals are self retaining in open housing bores without the use of a cover plate. The metal casing provides the required stability in the housing bore.

Spacer lugs are optional to provide space for grease lubrication in between 2 seals in tandem or back to back installations.

HDS7 features a sealing lip without spring, optimized for excluding contaminations in grease purge applications.

Spring activated sealing lips

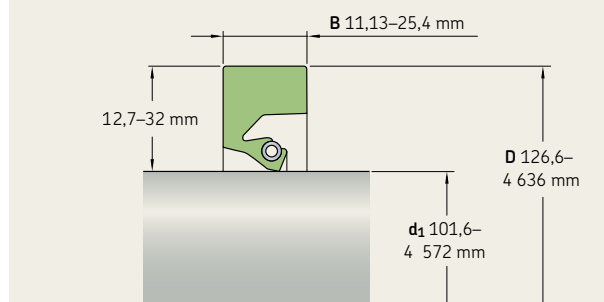
HS, HSS and HDS seals feature the same heavy duty spring activated lip design. The seals are equipped with stainless garter springs. The SKF Springfix for HSS and HDS seals is an optional feature for blind installations, where spring displacement may go undetected.

For this range catalogue size tables are obsolete. The seals are configured by the customer with the full size flexibility within the range of the offering (→ fig. 1, 2, 3).

Please refer to the SKF seal configuration tools or contact SKF.

Fig. 1

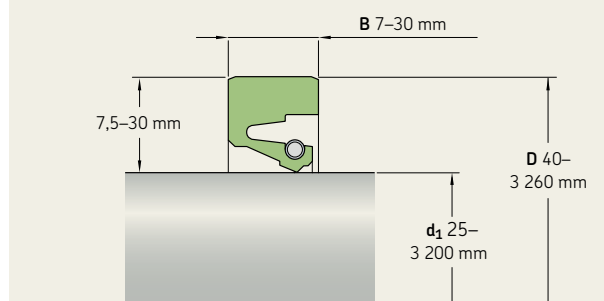
HS and HSS nominal housing dimensions



Note: Not all combinations are possible

Fig. 2

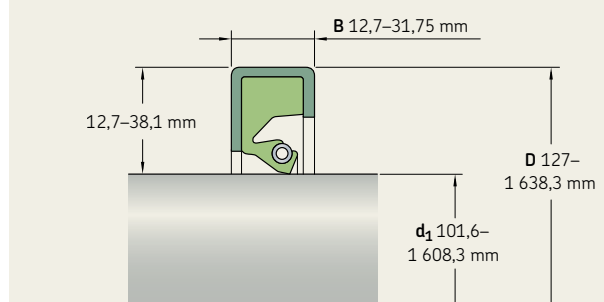
R01 nominal housing dimensions



Note: Not all combinations are possible

Fig. 3

HDS nominal housing dimensions



Note: Not all combinations are possible

Engineered solutions application specific

Engineered solutions is the service offer by SKF to exceed the limits of catalogue seals

Customer requirements and experience indicate the need for advanced seal engineering.

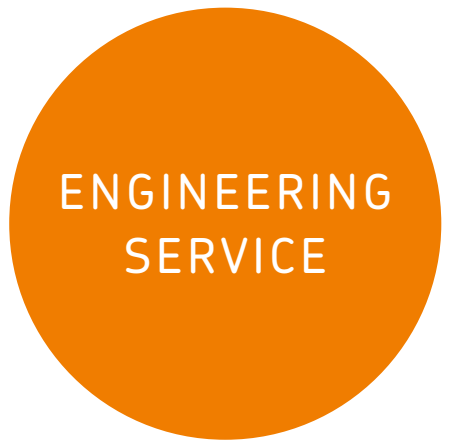
Proprietary SKF seal design and material competences, innovative manufacturing processes and the vast SKF application experience enable outstanding solutions meeting our customers' demand.



Customers and SKF engineers cooperate and create solutions meeting the application parameters

Seal application parameters

- Type of machine
- Expected seal function
- Environment, contamination
- Contact media
- Pressure (min./max.)
- Temperature (min./max.)
- Application speed
- Misalignment/Runout
- Seal counterface material
- Counterface finish and roughness
- Seal housing design and dimensions



High pressure grinding rollers



Wind turbine



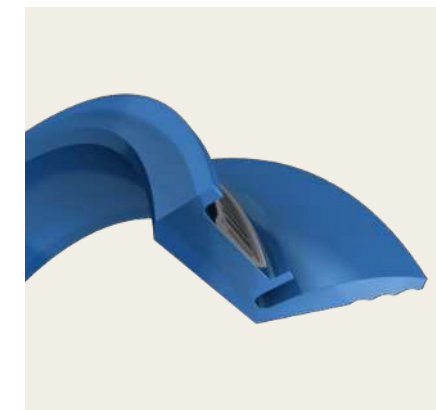
Aluminium rolling mill



Tunnel boring machine



Steel wire mill



Mining equipment



Application specific design

Shaft and bore requirements

Shaft requirements

Hardness

The surface hardness of the seal counterface should be at least 40 HRC.

Lead-in chamfers

The sealing lip must not be damaged during installation. Depending on the installation direction Y or Z, a chamfer or radius on the shaft is recommended first. If the direction of installation of the shaft is Y the values of **table 2** ($d_1 - d_2$) should be adhered to. If the direction is Z, the shaft end could be either rounded (r) or chamfered ($d_1 - d_2$).

Surface finish

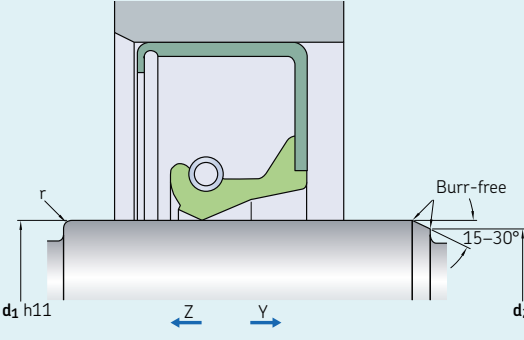
Depending on the direction of rotation, directionality on the seal counterface may cause a seal to leak. Plunge grinding is the preferred machining method to minimize directionality ($0 \pm 0,05^\circ$) on the seal counterface. When plunge grinding, whole number ratios of the grinding wheel speed to the work piece speed should be avoided.

Surface roughness

The surface roughness values of the counterface for radial shaft seals, calculated according to methods described in ISO 4288 (DIN 4768), should be kept within the limits specified in **table 3**.

Tolerances

The diameter of the shaft d_1 at the counterface should be machined to the tolerances provided in **table 4**. Out-of-roundness must be less than 0,005 mm (0.0002 in.) at a maximum of 2 lobes or less than 0,0025 mm (0.0001 in.) at a maximum of 7 lobes.

Table 2									
Lead-in chamfers and radii									
									
Shaft diameter Nominal		Diameter difference ¹⁾		Radii Seal without auxiliary lip		Seal with auxiliary lip			
d_1 over	incl.	over	incl.	$d_1 - d_2$ min.	r min.	r min.			
mm		in.		mm	in.	mm	in.	mm	in.
–	10	–	0.394	1,5	0.059	0,6	0.024	1	0.039
10	20	0.394	0.787	2	0.079	0,6	0.024	1	0.039
20	30	0.787	1.181	2,5	0.098	0,6	0.024	1	0.039
30	40	1.181	1.575	3	0.118	0,6	0.024	1	0.039
40	50	1.575	1.968	3,5	0.138	0,6	0.024	1	0.039
50	70	1.968	2.756	4	0.157	0,6	0.024	1	0.039
70	95	2.756	3.740	4,5	0.177	0,6	0.024	1	0.039
95	130	3.740	5.118	5,5	0.216	1	0.039	2	0.079
130	240	5.118	9.449	7	0.216	1	0.039	2	0.079
240	500	9.449	19.685	11	0.433	2	0.079	3	0.118
500	–	19.685	–	13	0.512	5	0.197	5	0.197

¹⁾ If the corner is blended rather than chamfered, the blended section should not be smaller than the difference in diameters $d_1 - d_2$.

Table 3						
Recommended shaft surface roughness values						
	ISO		DIN		RMA	
	μm	$\mu\text{in.}$	μm	$\mu\text{in.}$	μm	$\mu\text{in.}$
R_a	0,2–0,5	8–20	0,2–0,8	8–32	0,2–0,43	8–17
R_z	1,2–3	48–120	1–5	40–200	1,65–2,9	65–115
R_{pm}	N/A	N/A	N/A	N/A	0,5–1,5	20–50

Table 4			
Counterface tolerances for metric shafts (ISO)			
Shaft diameter		Diameter tolerance h11	
Nominal		Deviation	
d ₁ over	incl.	high	low
mm		μm	
6	10	0	−90
10	18	0	−110
18	30	0	−130
30	50	0	−160
50	80	0	−190
80	120	0	−220
120	180	0	−250
180	250	0	−290
250	315	0	−320
315	400	0	−360
400	500	0	−400
500	630	0	−440
630	800	0	−500
800	1 000	0	−560
1 000	1 250	0	−660
1 250	1 600	0	−780
1 600	2 000	0	−920
2 000	2 500	0	−1 100
2 500	3 150	0	−1 350
3 150	4 000	0	−1 650
4 000	5 000	0	−2 000

Table 5			
Counterface tolerances for inch-size shafts (RMA)			
Shaft diameter		Diameter tolerance OS-4	
Nominal		Deviation	
d_1 over	incl.	high	low
<i>in.</i>		<i>in</i>	
–	4	+0.003	–0.003
4	6	+0.004	–0.004
6	10	+0.005	–0.005
10		+0.006	–0.006

Housing bore requirements

Lead-in chamfers

To reduce the risk of seal damage during installation, the housing bore should have a 15 to 30° lead-in chamfer. The chamfer should be free of burrs and the transition radius *r* between the seal seat and shoulder should be in accordance with the recommendations in **table 6**.

Housing bore depth tolerances

For housings with cover plate (axially clamped seals), the bore depth tolerance should be in accordance with the recommendations in **table 8**.

Housing bore surfaces

The surface roughness (to ISO 4288, DIN 4768 or RMA OS-1-1) of the housing bore should be kept within the limits specified in **table 7**.

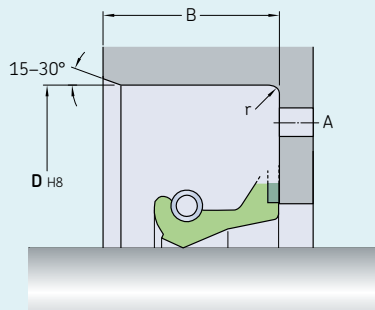
Table 6										
Housing bore tolerances										
										
Housing bore for metric seals (ISO)					Housing bore for inch-size seals (RMA)					
Nominal diameter		Housing bore tolerance (ISO tolerance H8)		Fillet radii	Nominal diameter		Housing bore tolerance		Fillet radii	
D over	incl.	high	low	r max.	D over	incl.	high	low	r max.	
mm		µm		mm	in.		in.		in.	
–	3	+14	0	0,3	–	3.000	+0.001	–0.001	0.031	
3	6	+18	0	0,3	3.000	7.000	+0.0015	–0.0015	0.031	
6	10	+22	0	0,3	7.000	10.000	+0.002	–0.002	0.031	
10	18	+27	0	0,3	10.000 ²⁾	12.000	+0.002	–0.002	0.031	
18	30	+33	0	0,3	12.000 ²⁾	20.000	+0.003	–0.003	0.031	
30	50	+39	0	0,3	20.000 ²⁾	40.000	+0.004	–0.004	0.031	
50	80	+46	0	0,4	40.000 ²⁾	60.000	+0.006	–0.006	0.031	
80	120	+54	0	0,8						
120	180	+63	0	0,8						
180	250	+72	0	0,8						
250	315	+81	0	0,8						
315	400	+89	0	0,8						
400	500	+97	0	0,8						
500	630	+110	0	0,8						
630	800	+125	0	0,8						
800	1 000	+140	0	0,8						
1 000	1 250	+165	0	0,8						
1 250	1 600	+195	0	0,8						
1 600	2 000	+230	0	0,8						
2 000	2 500	+280	0	0,8						
2 500	3 150	+330	0	0,8						
3 150 ¹⁾	4 000	+410	0	0,8						
4 000	5 000	+500	0	0,8						
¹⁾ SKF recommended bore specifications not covered in ISO 286-2										
²⁾ SKF recommended bore specifications not covered in RMA OS-4										

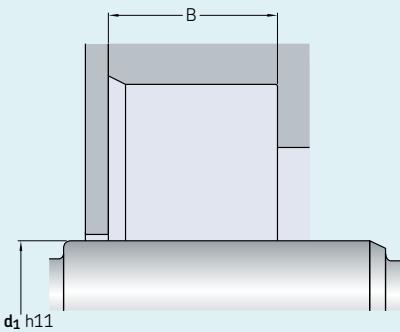
Table 7										
Housing with cover plate, bore depth tolerances										
										
Metric housings (ISO)				Inch-size housings (RMA)						
Nominal shaft diameter		Bore depth B tolerance		Nominal shaft diameter		Bore depth B tolerance				
d1 over	incl.	high	low	d1 over	until	high	low			
mm		mm		in.		in.				
–	15	0	–0,1	–	1.000	0	–0.004			
16		+0,1	–0,1	1.000		+0.004	–0.004			

Table 8						
Recommended housing bore surface roughness values						
	ISO ¹⁾		DIN		RMA ²⁾³⁾	
	µm	µin.	µm	µin.	µm	µin.
R _a	1,6–3,2	64–128	1,6–3,2	64–128	1–2,5	40–100
R _z	6,3–12,5	252–500	10–20	400–800	N/A	N/A
R _{pm}	N/A	N/A	25	1 000	N/A	N/A
¹⁾ ISO – The housing bore surface roughness may require lower values when metal-cased seals are used, in which case they should be subject to agreement between the manufacturer and user.						
²⁾ RMA – If the bore surface texture is greater than 2,5 µm (100 µin.) R _a , a sealant should be used.						
³⁾ RMA – Turned bores, where a lubricant head of up to 0,20 bar (3.0 psi) is present at the seal. If this texture is maintained and tool removal marks or bore defects are present, no outside diameter leakage should occur.						



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PUB SE/P2 17938/2 EN · July 2025

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