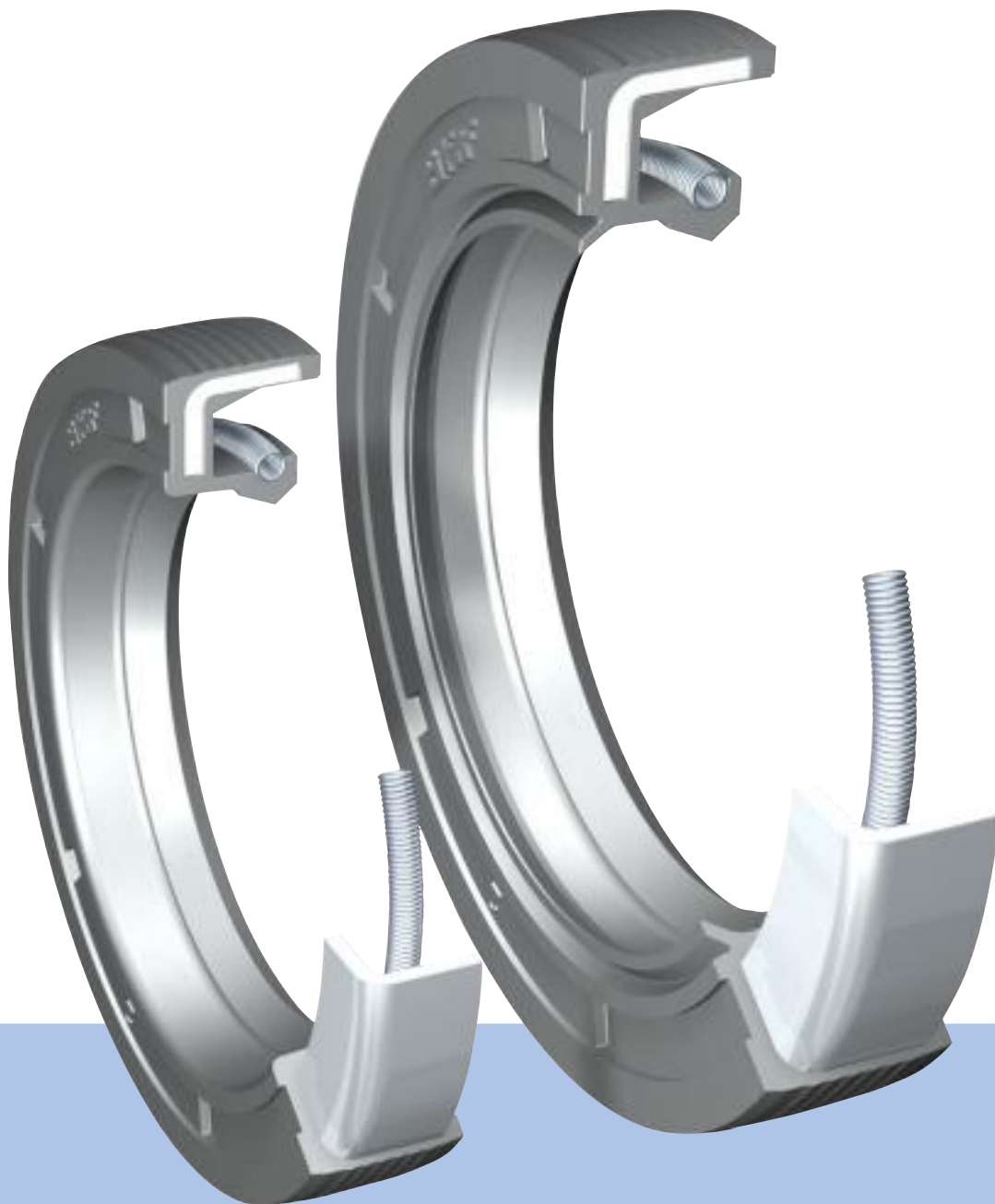


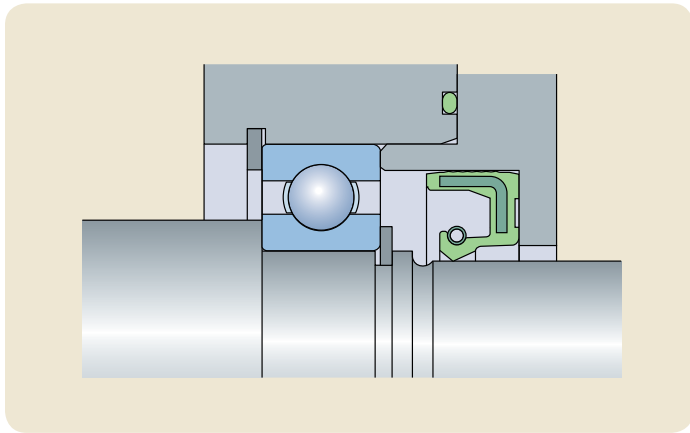
Maximizing performance



Radial shaft seals HMS5 and HMSA10

- Longer service life
- Improved sealing performance
- Excellent oil compatibility





Installation example

Radial shaft seals

HMS5 and HMSA10

Main features

SKF metric line of rubber outside diameter radial shaft seals, HMS5 and HMSA10, is designed in accordance with ISO 6194-1 and DIN 3760 for use in a wide range of industrial applications (→ **figs. 1** and **2**). The available size range of HMS5 and HMSA10 includes a full coverage of the ISO 6194-1 and DIN 3760 dimensions for shaft diameters up to 250 mm (9.842 in.) as well as an extensive range of dimensions commonly used in the market. Main features include:

- optimized sealing lip material
- spring-loaded sealing lip
- optimally balanced sealing lip and flex section
- beaded outside diameter
- auxiliary lip (HMSA10 seals only)

Design

The rubber outside diameter provides optimized sealing ability in the housing, also at considerable surface roughness or in split housings.

The beads on the outside diameter provide improved sealing ability and reliable retention in the bore. They also prevent spring-back at installation.

The spring-loaded sealing lip contributes to a quick response in handling dynamic run-

out and maintaining the sealing ability, also when sealing lip wear is excessive.

Sealing lip and flex section are optimally balanced to withstand considerable dynamic runout and shaft-to-bore misalignment.

The auxiliary lip on HMSA10 seals is non-contacting, which means that the seals normally can be used at the same speeds as the single-lip HMS5 seals.

Material

Metal insert:

mild steel

Spring:

spring steel

Sealing lip and outside diameter:

acrylonitrile-butadiene (nitrile rubber), hardness 75° Shore A.

The optimized nitrile rubber compound used for the HMS5 and HMSA10 seals has the designation suffix RG. It is the result of developments in seal material research at SKF. Advantages of this material include:

- good resistance to ageing
- excellent compatibility with synthetic oils
- very good pumping ability
- good wear resistance

Pumping ability is defined as the time it takes for the seal to return a certain amount of oil

from the air side to the oil side. The micro-structure of the SKF developed nitrile rubber compound RG promotes rapid pumping of the oil (→ **table 1**).

In **diagram 1**, results from endurance tests show the extended service life of seals made of the optimized nitrile compound.

The complete range of HMS5 and HMSA10 seals is also available in a fluoro rubber compound with a stainless steel garter spring. This compound has the designation suffix V and is used in applications where temperatures exceed the limits of nitrile rubber.

Applications and operating conditions

HMS5 and HMSA10 seals are designed for oil or grease lubricated applications with temperatures ranging from -40 to +100 °C (-40 to 210 °F), short-term up to 120 °C (250 °F). The seals are also appropriate for sealing lubricants within a wide range of viscosities.

Circumferential speed:

up to 14 m/s (2 755 ft/min)

Operating pressure:

max 0,03 MPa (5 psi)

These values are the maximum value for each service condition and should not occur together. Consideration should be given as to how the operating conditions affect each other. For information on seals under pressure, please see our catalogue *Industrial shaft seals*.

Machining directions

Recommendations according to ISO 6194-1 standard

Shaft

Tolerance:

h11

Surface roughness:

R_a 0,2 to 0,5 μm

R_z 1,2 to 3 μm

Hardness:

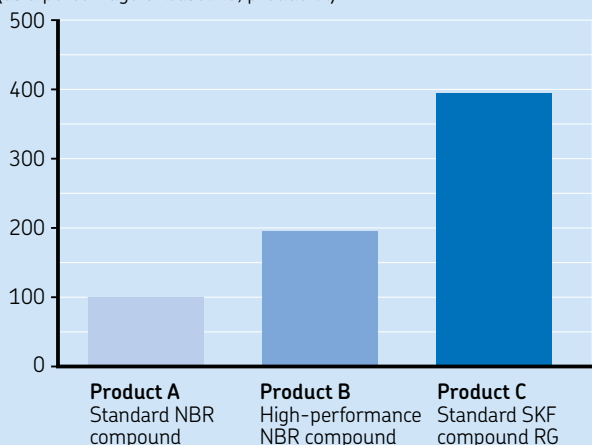
minimum 45 HRC

Surface texture:

non-oriented, preferably by plunge grinding

Diagram 1

Average seal life
(as a percentage of baseline, product A)



Endurance test

Table 1

Speed Rotating	Circumferential	Pumping time	
		Standard NBR	SKF compound RG
r/min	m/s	s	s
1 000	3,1	–	117
1 500	4,7	280	69
2 000	6,3	186	50
2 500	7,9	130	40
3 000	9,4	102	31
3 500	11,0	82	25
4 000	12,6	68	21
4 500	14,1	57	18

Shaft diameter 60 mm, engine oil SAE 30

Pumping performance

Housing bore

Tolerance:

H8

Surface roughness:

R_a 1,6 to 3,2 μm

R_z 6,3 to 12,5 μm

Recommendations according to DIN 3760 standard

Shaft

Tolerance:

h11

Surface roughness:

R_a 0,2 to 0,8 μm

R_z 1 to 5 μm

Hardness:

minimum 45 HRC

Surface texture:

non-oriented, preferably by plunge grinding

Housing bore

Tolerance:

H8

Surface roughness:

R_a 1,6 to 6,3 μm

R_z 10 to 20 μm

Installation

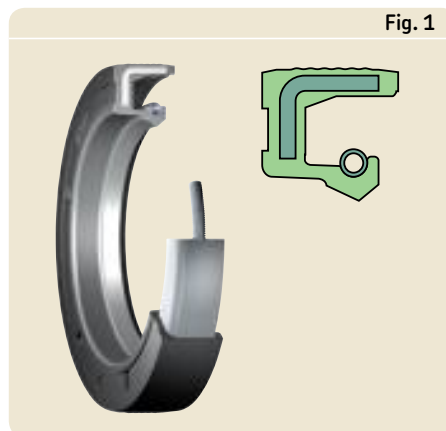
Careful installation according to ISO 6194-3 or DIN 3760 is a prerequisite for proper functioning of the seal.

For further details regarding installation of SKF radial shaft seals, please see our catalogue *Industrial shaft seals* or visit us online at skf.com/seals.

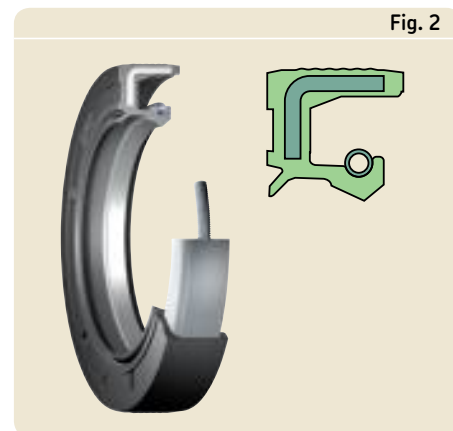
SKF recommends the use of HMSA10 seals with an auxiliary lip in applications with increased demand on protection of the primary lip.

For more information, please contact your local SKF sales representative.

HMS5

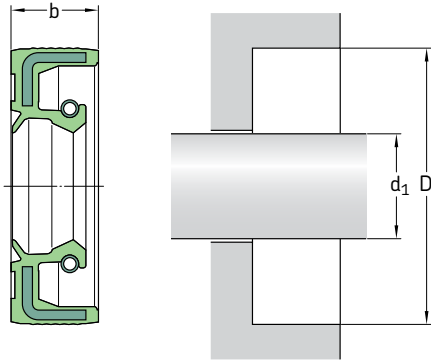


HMSA10



Radial shaft seals – HMS5 and HMSA10

d₁ 6 – 25 mm



Dimensions				Designation ¹⁾	ISO/DIN	Dimensions			
Shaft	Bore	Nominal seal width				Shaft	Bore	Nominal seal width	
d ₁	D	b			d ₁	D	b		
mm				–	–	mm			
6	16	5	6×16×5		12 cont.	28	7	12×28×7	
	16	7	6×16×7	•		30	7	12×30×7	•
	22	7	6×22×7	•		32	7	12×32×7	
7	16	7	7×16×7²⁾		37	7	12×37×7		
	22	7	7×22×7	•	13	26	7	13×26×7	
8	18	5	8×18×5			14	24	7	14×24×7
	18	7	8×18×7		25		5	14×25×5	
	22	7	8×22×7	•	28		7	14×28×7	
	24	7	8×24×7	•	30		7	14×30×7	•
9	22	7	9×22×7	•	15	24	7	15×24×7²⁾	
10	19	7	10×19×7²⁾			25	5	15×25×5	
	20	6	10×20×6			25	6	15×25×6	
	20	7	10×20×7			26	7	15×26×7	•
	22	7	10×22×7	•		30	7	15×30×7	•
	24	7	10×24×7	•		32	7	15×32×7	
	25	7	10×25×7	•		35	7	15×35×7	•
	26	7	10×26×7	•		40	7	15×40×7	
	30	7	10×30×7		40	10	15×40×10		
12	19	5	12×19×5²⁾		16	24	7	16×24×7²⁾	
	22	5	12×22×5			28	7	16×28×7	
	22	6	12×22×6			30	7	16×30×7	•
	22	7	12×22×7	•		32	7	16×32×7	
	24	7	12×24×7	•		35	7	16×35×7	•

¹⁾ To be followed by the design and material codes, indicating one of the four variants available for each dimension:

HMS5 RG without auxiliary lip, nitrile rubber

HMS5 V without auxiliary lip, fluoro rubber

HMSA10 RG with auxiliary lip, nitrile rubber

HMSA10 V with auxiliary lip, fluoro rubber

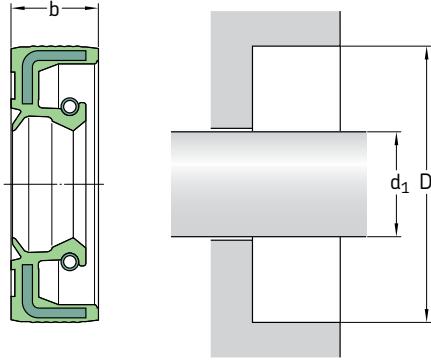
Example: **6×16×5 HMSA10 RG**

²⁾ Design execution differs from the basic design and is indicated by a number, e.g. RG1

Dimensions			Designation ¹⁾	ISO/DIN	Dimensions			Designation ¹⁾	ISO/DIN
Shaft	Bore	Nominal seal width			Shaft	Bore	Nominal seal width		
d ₁	D	b				b			
mm			–	–	mm			–	–
17	28	7	17×28×7		22	32	7	22×32×7	
	29	5	17×29×5			35	7	22×35×7	•
	30	7	17×30×7			36	7	22×36×7	
	32	7	17×32×7			38	8	22×38×8	
	35	7	17×35×7			40	7	22×40×7	•
	37	7	17×37×7			40	10	22×40×10	
	40	7	17×40×7			42	10	22×42×10	
	40	10	17×40×10			45	7	22×45×7	
	47	7	17×47×7			47	7	22×47×7	•
	47	10	17×47×10						
18	28	7	18×28×7		23	40	10	23×40×10	
	30	6	18×30×6		24	35	7	24×35×7	
	30	7	18×30×7	•		37	7	24×37×7	
	32	7	18×32×7			40	7	24×40×7	
	35	7	18×35×7	•		42	8	24×42×8	
	40	7	18×40×7			47	7	24×47×7	
				50		10	24×50×10		
19	30	7	19×30×7		25	35	6	25×35×6	
	30	8	19×30×8			35	7	25×35×7	•
	32	7	19×32×7			37	5	25×37×5	
42	6	19×42×6		37		6	25×37×6		
20	30	5	20×30×5			37	7	25×37×7	
	30	7	20×30×7	•		38	7	25×38×7	
	32	6	20×32×6			40	5	25×40×5	
	32	7	20×32×7			40	7	25×40×7	•
	34	7	20×34×7			40	8	25×40×8	
	35	6	20×35×6			40	10	25×40×10	
	35	7	20×35×7	•	42	6	25×42×6		
	35	8	20×35×8		42	7	25×42×7		
	35	10	20×35×10		42	10	25×42×10		
	36	7	20×36×7		45	7	25×45×7		
	38	7	20×38×7		45	8	25×45×8		
	40	7	20×40×7		45	10	25×45×10		
	40	10	20×40×10	•	46	7	25×46×7		
	42	7	20×42×7		47	7	25×47×7	•	
	42	10	20×42×10		47	10	25×47×10		
	45	7	20×45×7		50	10	25×50×10		
	47	7	20×47×7		52	7	25×52×7	•	
47	10	20×47×10		52	8	25×52×8			
				52	10	25×52×10			
21	52	7	20×52×7		62	7	25×62×7		
	52	10	20×52×10		62	8	25×62×8		
	35	7	21×35×7		62	10	25×62×10		
	40	7	21×40×7		72	7	25×72×7		

Radial shaft seals – HMS5 and HMSA10

d₁ 26 – 40 mm



Dimensions				Designation ¹⁾	ISO/DIN	Dimensions			
Shaft	Bore	Nominal seal width				Shaft	Bore	Nominal seal width	
d ₁	D	b			d ₁	D	b		
mm				–	–	mm			
26	37	7	26x37x7		30 cont.	44	7	30x44x7	
	38	5	26x38x5			45	7	30x45x7	
	38	7	26x38x7			45	8	30x45x8	
	42	7	26x42x7			46	7	30x46x7	
	47	7	26x47x7			47	6	30x47x6	
27	37	7	27x37x7		47	7	30x47x7	•	
	42	10	27x42x10		47	8	30x47x8		
	43	7	27x43x7		47	10	30x47x10		
	47	7	27x47x7		48	8	30x48x8		
	47	10	27x47x10		50	7	30x50x7		
28	38	7	28x38x7		50	8	30x50x8		
	38	8	28x38x8		50	10	30x50x10		
	40	7	28x40x7	•	52	7	30x52x7	•	
	40	8	28x40x8		52	8	30x52x8		
	42	7	28x42x7		52	10	30x52x10		
	42	8	28x42x8		55	7	30x55x7		
	44	6	28x44x6		55	10	30x55x10		
	45	8	28x45x8		62	7	30x62x7		
	47	7	28x47x7	•	62	10	30x62x10		
	47	10	28x47x10		72	10	30x72x10		
30	40	7	30x40x7	•	32	42	7	32x42x7	
	42	6	30x42x6			43	7	32x43x7	
	42	7	30x42x7	•		44	7	32x44x7	
	42	8	30x42x8			45	7	32x45x7	•
						45	8	32x45x8	•
						47	6	32x47x6	
						47	7	32x47x7	•
						47	8	32x47x8	•
						47	10	32x47x10	•

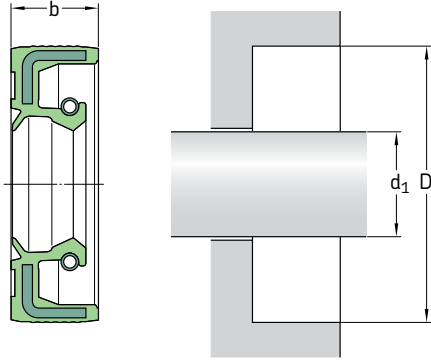
¹⁾ To be followed by the design and material codes, indicating one of the four variants available for each dimension:

- HMS5 RG** without auxiliary lip, nitrile rubber
 - MS5 V** without auxiliary lip, fluoro rubber
 - HMSA10 RG** with auxiliary lip, nitrile rubber
 - HMSA10 V** with auxiliary lip, fluoro rubber
- Example: **28x38x7 HMSA10 RG**

Dimensions			Designation ¹⁾	ISO/DIN	Dimensions			Designation ¹⁾	ISO/DIN	
Shaft	Bore	Nominal seal width			Shaft	Bore	Nominal seal width			
d ₁	D	b								
mm			–	–	mm		–	–		
32 cont.	48	8	32×48×8		36 cont.	58	10	36×58×10		
	50	8	32×50×8			62	7	36×62×7		
	50	10	32×50×10			37	50	6	37×50×6	
	52	7	32×52×7	•			38	50	7	38×50×7
	52	8	32×52×8	•		52		7	38×52×7	
	55	10	32×55×10			52	8	38×52×8		
	62	10	32×62×10			54	10	38×54×10		
33	72	7	32×72×7		55	7	38×55×7	•		
	45	7	33×45×7		55	8	38×55×8	•		
		6	33×50×6		55	10	38×55×10	•		
34	44	8	34×44×8		58	8	38×58×8	•		
	48	8	34×48×8		58	10	38×58×10			
34	48	8	34×48×8		60	10	38×60×10			
	52	8	CR 34×52×8		62	7	38×62×7	•		
	62	8	34×62×8		62	8	38×62×8	•		
		10	34×62×10		62	10	38×62×10			
	35	45	7	35×45×7		72	10	38×72×10		
		47	6	35×47×6		80	8	38×80×8		
47	7	35×47×7	•	38,5	58	7	38.5×58×7			
47	8	35×47×8	•		40	50	8	40×50×8		
48	8	35×48×8		52		6	40×52×6			
49	6	35×49×6		52	7	40×52×7	•			
50	7	35×50×7	•	52	8	40×52×8	•			
50	8	35×50×8	•	55	7	40×55×7	•			
50	10	35×50×10			55	8	40×55×8	•		
52	7	35×52×7	•	56	8	40×56×8				
52	8	35×52×8	•		58	7	40×58×7			
52	10	35×52×10	•	58	8	40×58×8				
55	7	35×55×7	•	58	10	40×58×10				
55	8	35×55×8	•	59	8	40×59×8				
55	10	35×55×10			60	8	40×60×8			
56	10	35×56×10		60	10	40×60×10				
58	10	35×58×10		62	6	40×62×6				
60	10	35×60×10			62	7	40×62×7	•		
	62	7	35×62×7		62	8	40×62×8	•		
	62	8	35×62×8		62	10	40×62×10	•		
	62	10	35×62×10		65	10	40×65×10			
72	7	35×72×7		65		12	40×65×12			
72	10	35×72×10		68	8	40×68×8				
72	12	35×72×12			68	10	40×68×10			
36	80	12	35×80×12		70	8	40×70×8			
	47	7	36×47×7		72	7	40×72×7			
		7	36×50×7			72	10	40×72×10		
	50	7	36×50×7		80	8	40×80×8			
	52	7	36×52×7			80	10	40×80×10		
		8	36×52×8			80	12	40×80×12		

Radial shaft seals – HMS5 and HMSA10

d₁ 40 – 65 mm



Dimensions				Designation ¹⁾	ISO/DIN	Dimensions			
Shaft	Bore	Nominal seal width				Shaft	Bore	Nominal seal width	
d ₁	D	b			d ₁	D	b		
mm				-	-	mm			
40	90	10	40×90×10		45	62	7	45×62×7	
cont.	90	12	40×90×12		cont.	62	8	45×62×8	•
41	56	7	41×56×7			62	10	45×62×10	
42	53	7	42×53×7			65	8	45×65×8	•
						65	10	45×65×10	
	55	7	42×55×7			68	7	45×68×7	
	55	8	42×55×8	•		68	10	45×68×10	
						68	12	45×68×12	
	56	7	42×56×7			72	8	45×72×8	
	60	7	42×60×7			72	10	45×72×10	
	62	7	42×62×7			75	8	45×75×8	
	62	8	42×62×8	•		75	10	45×75×10	
	62	10	42×62×10						
	65	10	42×65×10			80	10	45×80×10	
	65	12	42×65×12			85	10	45×85×10	
	66	10	42×66×10			100	10	45×100×10	
	67	10	42×67×10		46	59	12	46×59×12	
	72	8	42×72×8			65	10	46×65×10	
	72	10	42×72×10		47	65	10	47×65×10	
43	62	8	43×62×8			70	10	47×70×10	
44	60	10	44×60×10			90	10	47×90×10	
	62	10	44×62×10		48	62	8	48×62×8	•
	65	10	44×65×10			65	10	48×65×10	
45	55	7	45×55×7			68	10	48×68×10	
	58	7	45×58×7			70	10	48×70×10	
	60	7	45×60×7						
	60	8	45×60×8	•					
	60	10	45×60×10						

¹⁾ To be followed by the design and material codes, indicating one of the four variants available for each dimension:

HMS5 RG without auxiliary lip, nitrile rubber

HMS5 V without auxiliary lip, fluoro rubber

HMSA10 RG with auxiliary lip, nitrile rubber

HMSA10 V with auxiliary lip, fluoro rubber

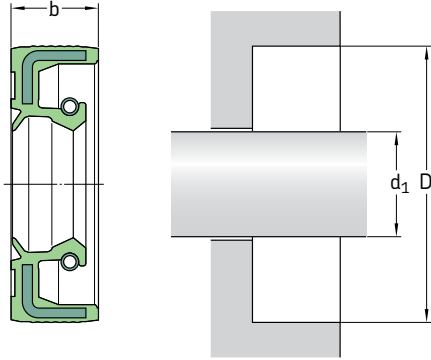
Example: **44×60×10 HMSA10 RG**

²⁾ Design execution differs from the basic design and is indicated by a number, e.g. RG1.

Dimensions			Designation ¹⁾	ISO/DIN	Dimensions			Designation ¹⁾	ISO/DIN
Shaft	Bore	Nominal seal width			Shaft	Bore	Nominal seal width		
d ₁	D	b				b			
mm			–	–	mm			–	–
48 cont.	72	7	48×72×7		55 cont.	100	10	55×100×10	
	72	8	48×72×8			100	12	55×100×12	
	72	10	48×72×10						
50	62	7	50×62×7		56	72	8	56×72×8	
	64	6	50×64×6		57	67	7	57×67×7	
	65	8	50×65×8	•	58	72	8	58×72×8	
	65	10	50×65×10			80	8	58×80×8	
						80	10	58×80×10	
	68	7	50×68×7		80	12	58×80×12		
	68	8	50×68×8	•	60	72	8	60×72×8	
	68	10	50×68×10			75	8	60×75×8	•
	70	10	50×70×10			80	7	60×80×7	
	72	8	50×72×8	•	80	8	60×80×8	•	
	72	10	50×72×10		80	10	60×80×10		
	72	12	50×72×12						
	75	10	50×75×10		82	12	60×82×12		
	80	8	50×80×8		85	8	60×85×8	•	
	80	10	50×80×10		85	10	60×85×10		
85	10	50×85×10		90	8	60×90×8			
90	10	50×90×10		90	10	60×90×10			
100	10	50×100×10		95	10	60×95×10			
52	63	8	52×63×8		100	10	60×100×10		
	65	8	52×65×8		110	8	60×110×8		
	68	8	52×68×8		110	10	60×110×10		
	72	8	52×72×8		62	80	10	62×80×10	
	72	10	52×72×10			85	10	62×85×10	
	80	10	52×80×10			90	10	62×90×10	
	85	10	52×85×10		63	85	10	63×85×10	
100	10	52×100×10		90		10	63×90×10		
55	68	8	55×68×8		64	80	8	64×80×8	
	70	8	55×70×8	•	65	80	8	65×80×8	
	70	10	55×70×10			85	8	65×85×8	
	72	8	55×72×8	•		85	10	65×85×10	•
	72	10	55×72×10		85	12	65×85×12		
	75	8	55×75×8		88	12	65×88×12		
	75	10	55×75×10		90	10	65×90×10	•	
	78	10	55×78×10		95	10	65×95×10		
	78	12	55×78×12						
	80	8	55×80×8	•	97	7	65×97×7		
	80	10	55×80×10		100	10	65×100×10		
85	8	55×85×8		110	10	65×110×10			
85	10	55×85×10		120	12	65×120×12			
90	8	55×90×8		140	12	65×140×12			
90	10	55×90×10							

Radial shaft seals – HMS5 and HMSA10

d₁ 68 – 250 mm



Dimensions				Designation ¹⁾	ISO/DIN	Dimensions			
Shaft	Bore	Nominal seal width				Shaft	Bore	Nominal seal width	
d ₁	D	b			d ₁	D	b		
mm			–	–	mm			–	
68	90	10	68×90×10		78	100	10	78×100×10	
70	85	8	70×85×8		80	95	10	80×95×10	
	90	7	70×90×7²⁾			100	10	80×100×10	•
	90	10	70×90×10	•		100	12	80×100×12	•
	90	12	70×90×12			105	10	80×105×10	
	92	12	70×92×12			110	10	80×110×10	•
	95	10	70×95×10	•		110	12	80×110×12	•
	100	10	70×100×10			115	12	80×115×12	
	110	10	70×110×10			125	12	80×125×12	
	110	12	70×110×12			170	13	80×170×13	
72	90	10	72×90×10		82	120	12	82×120×12	
	95	10	72×95×10			160	15	82×160×15	
	95	12	72×95×12		85	100	9	85×100×9	
	100	10	72×100×10			100	10	85×100×10	
	140	12	72×140×12			105	12	85×105×12	
75	90	10	75×90×10			110	12	85×110×12	•
	95	10	75×95×10	•		115	12	85×115×12	
	95	12	75×95×12			120	12	85×120×12	•
	100	10	75×100×10	•		130	12	85×130×12	
	100	12	75×100×12			140	12	85×140×12	
	105	10	75×105×10			150	12	85×150×12	
	110	12	75×110×12		90	110	10	90×110×10	•
	120	12	75×120×12			110	12	90×110×12	•
	130	12	75×130×12						

¹⁾ To be followed by the design and material codes, indicating one of the four variants available for each dimension:

HMS5 RG without auxiliary lip, nitrile rubber

HMS5 V without auxiliary lip, fluoro rubber

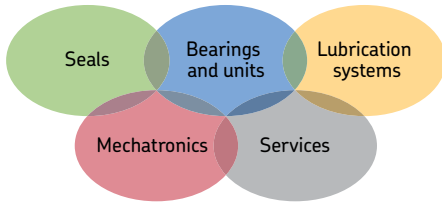
HMSA10 RG with auxiliary lip, nitrile rubber

HMSA10 V with auxiliary lip, fluoro rubber

Example: **90×110×10 HMSA10 RG**

²⁾ Design execution differs from the basic design and is indicated by a number, e.g. RG1.

Dimensions			Designation ¹⁾	ISO/DIN	Dimensions			Designation ¹⁾	ISO/DIN
Shaft	Bore	Nominal seal width			Shaft	Bore	Nominal seal width		
d ₁	D	b		d ₁	D	b			
mm			–	–	mm			–	–
90 cont.	115	12	90×115×12		130	160	12	130×160×12	•
	120	12	90×120×12	•		160	15	130×160×15	
95	110	12	95×110×12			170	12	130×170×12	
	115	12	95×115×12			180	12	130×180×12	
	120	12	95×120×12	•		190	12	130×190×12	
	125	12	95×125×12	•	135	170	12	135×170×12	•
	140	12	95×140×12		140	160	12	140×160×12	
	145	12	95×145×12			170	12	140×170×12	•
	170	13	95×170×13			170	15	140×170×15	
100	120	10	100×120×10		145	180	12	140×180×12	
	120	12	100×120×12	•		175	15	145×175×15	•
	125	12	100×125×12	•		180	12	145×180×12	
	130	12	100×130×12	•	148	170	15	148×170×15	
	140	12	100×140×12		150	170	12	150×170×12	
	145	12	100×145×12			180	12	150×180×12	•
	150	12	100×150×12			180	15	150×180×15	
105	130	12	105×130×12	•		200	12	150×200×12	
	135	12	105×135×12		155	180	15	155×180×15	
	140	12	105×140×12		160	185	15	160×185×15	
108	140	15	108×140×15			190	15	160×190×15	•
	170	15	108×170×15		165	190	15	165×190×15	
110	130	12	110×130×12	•	170	200	15	170×200×15	•
	130	13	110×130×13		175	200	15	175×200×15	
	140	12	110×140×12	•	180	200	15	180×200×15	
115	140	12	115×140×12	•		210	15	180×210×15	
	145	12	115×145×12		185	210	13	185×210×13	
	150	12	115×150×12		190	220	12	190×220×12²⁾	•
	150	12	115×150×12			220	15	190×220×15	
118	150	12	118×150×12			225	15	190×225×15	
120	140	12	120×140×12		200	230	15	200×230×15	•
	140	13	120×140×13		210	240	15	210×240×15	•
	150	12	120×150×12	•	220	250	15	220×250×15	•
	160	12	120×160×12		230	260	15	230×260×15	•
	180	15	120×180×15		240	270	15	240×270×15	•
125	150	12	125×150×12	•	250	280	15	250×280×15	•
	160	15	125×160×15			285	15	250×285×15	
	200	15	125×200×15						



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