

HMS5 and HMSA10 seals

Fig. 1



HMS5

Fig. 2



HMSA10

Main features

SKF metric rubber outside diameter radial shaft seals, HMS5 and HMSA10, are designed in accordance with ISO 6194-1 and DIN 3760 for use in a wide range of industrial applications. The available size range of HMS5 and HMSA10 seals 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. New dimensions are continually added. 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 retention in the bore. They also prevent spring-back during installation.

The spring-loaded sealing lip contributes to a quick response in handling dynamic runout and maintaining the sealing performance, even when sealing lip wear is excessive.

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

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

Material

The optimized nitrile rubber compound used for the HMS5 and HMSA10 seals has the designation suffix RG. The compound is the result of long experience and the latest findings from the SKF sealing material developments. Advantages of this material include:

- Good resistance to ageing
- Very good 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 microstructure of SKF's RG nitrile rubber compound promotes rapid pumping of the oil, (→ **table 2 on page 107**). In **diagram 1 on page 107**, 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 rubber 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 operating temperatures ranging from -40 to $+100$ °C (-40 to $+210$ °F), short-term up to 120 °C (250 °F). These 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. 0,05 MPa
(7 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, see [page 79](#).

New sizes

If the necessary size is not listed in the product tables on the following pages, we can add more sizes on request (also in inch size). Contact your local SKF representative.

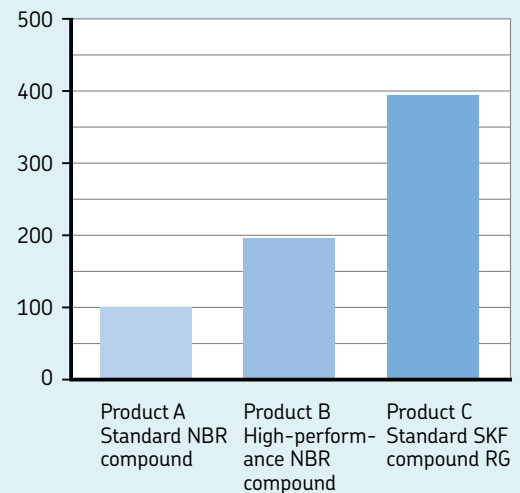
Table 2

Pumping ability			
Speed Rotating	Circumferential	Pumping time	
		Standard NBR	SKF compound RG
r/min	m/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

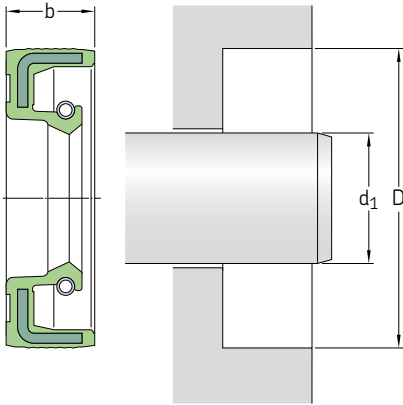
Shaft diameter 60 mm, engine oil SAE 30

Diagram 1

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



d₁ 6–25 mm



¹⁾ Designation 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, see also **page 102**.

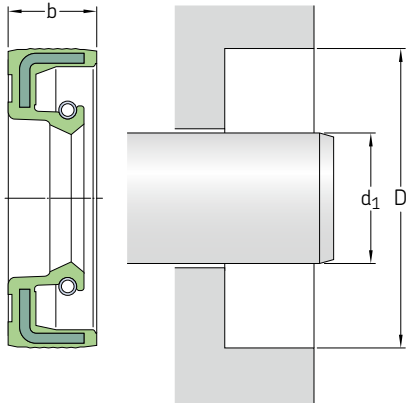


Please see **pages 85 and 86** for housing bore requirements.

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.	30	7	12×30×7	•
	16	7	6×16×7			32	7	12×32×7	
	22	7	6×22×7			37	7	12×37×7	
7	16	7	7×16×7²⁾	•	13	26	7	13×26×7	•
	22	7	7×22×7			24	7	14×24×7	
8	18	5	8×18×5	•	14	25	5	14×25×5	•
	18	7	8×18×7			28	7	14×28×7	
	22	7	8×22×7			30	7	14×30×7	
	24	7	8×24×7			15	24	7	
9	22	7	9×22×7	25	5		15×25×5		
	10	19	7	10×19×7²⁾	25	6	15×25×6		
		20	6	10×20×6	26	7	15×26×7		
	20	7	10×20×7	30	7	15×30×7			
	22	7	10×22×7	32	7	15×32×7			
	24	7	10×24×7	35	7	15×35×7			
12	25	7	10×25×7	16	40	7	15×40×7	•	
	26	7	10×26×7		40	10	15×40×10		
	30	7	10×30×7	24	7	16×24×7²⁾	•		
	12	19	5	12×19×5²⁾	28	7		16×28×7	
		22	5	12×22×5	30	7	16×30×7		
	22	6	12×22×6	32	7	16×32×7	•		
	22	7	12×22×7	35	7	16×35×7			
	24	7	12×24×7	17	28	7	17×28×7	•	
	25	7	12×25×7						
	28	7	12×28×7						

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			–	–
17 cont.	29	5	17×29×5		22	32	7	22×32×7	
	30	7	17×30×7		35	7	22×35×7	•	
	32	7	17×32×7		36	7	22×36×7		
	35	7	17×35×7		38	8	22×38×8		
	37	7	17×37×7		40	7	22×40×7	•	
	40	7	17×40×7		40	10	22×40×10		
	40	10	17×40×10		42	10	22×42×10		
	47	7	17×47×7		45	7	22×45×7		
	47	10	17×47×10		47	7	22×47×7	•	
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		
19	30	7	19×30×7			50	10	24×50×10	
	30	8	19×30×8		25	35	6	25×35×6	
	32	7	19×32×7		35	7	25×35×7	•	
	42	6	19×42×6		37	5	25×37×5		
20	30	5	20×30×5		37	6	25×37×6		
	30	7	20×30×7	•	37	7	25×37×7		
	32	6	20×32×6		38	7	25×38×7		
	32	7	20×32×7		40	5	25×40×5		
	34	7	20×34×7		40	7	25×40×7	•	
	35	6	20×35×6		40	8	25×40×8		
	35	7	20×35×7	•	40	10	25×40×10		
	35	8	20×35×8		42	6	25×42×6		
	35	10	20×35×10		42	7	25×42×7		
	36	7	20×36×7		42	10	25×42×10		
	38	7	20×38×7		45	7	25×45×7		
	40	7	20×40×7	•	45	8	25×45×8		
	40	10	20×40×10		45	10	25×45×10		
	42	7	20×42×7		46	7	25×46×7		
	42	10	20×42×10		47	7	25×47×7	•	
	45	7	20×45×7		47	10	25×47×10		
	47	7	20×47×7		50	10	25×50×10		
47	10	20×47×10		52	7	25×52×7	•		
52	7	20×52×7		52	8	25×52×8			
52	10	20×52×10		52	10	25×52×10			
21	35	7	21×35×7		62	7	25×62×7		
	40	7	21×40×7		62	8	25×62×8		
					62	10	25×62×10		
				72	7	25×72×7			

d₁ 26–40 mm



¹⁾ Designation 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: **6x16x5 HMSA10 RG**

²⁾ Design execution differs from the basic design and is indicated by a number, see also **page 102**.

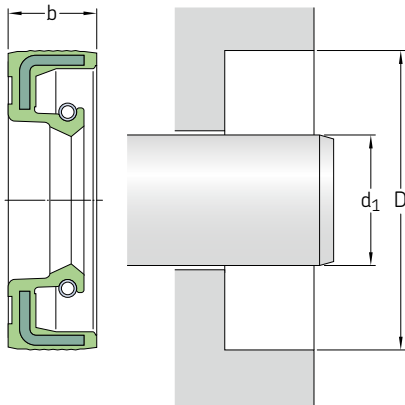


Please see **pages 85 and 86** for housing bore requirements.

Dimensions				Designation ¹⁾	ISO / DIN	Dimensions				Designation ¹⁾	ISO / DIN			
Shaft	Bore	Nominal seal width	b			Shaft	Bore	Nominal seal width	b					
d ₁	D													
mm				–	–	mm				–	–			
26	37	7		26x37x7					30	45	7		30x45x7	
	38	5		26x38x5					cont.	45	8		30x45x8	
	38	7		26x38x7						46	7		30x46x7	
	42	7		26x42x7						47	6		30x47x6	
	47	7		26x47x7						47	7		30x47x7	•
	47	7		26x47x7						47	8		30x47x8	
27	37	7		27x37x7						47	10		30x47x10	
	42	10		27x42x10						48	8		30x48x8	
	43	7		27x43x7						50	5		30x50x5	
	47	7		27x47x7						50	7		30x50x7	
	47	7		27x47x7						50	8		30x50x8	
	47	10		27x47x10						50	10		30x50x10	
28	38	7		28x38x7						52	7		30x52x7	•
	38	8		28x38x8						52	8		30x52x8	
										52	10		30x52x10	
	40	7		28x40x7	•					55	7		30x55x7	
	40	8		28x40x8						55	10		30x55x10	
	42	7		28x42x7						62	7		30x62x7	
	42	8		28x42x8						62	10		30x62x10	
	44	6		28x44x6						72	10		30x72x10	
	45	8		28x45x8					32	42	7		32x42x7	
	47	7		28x47x7	•					43	7		32x43x7	
	47	10		28x47x10						44	7		32x44x7	
	52	7		28x52x7	•					45	7		32x45x7	•
52	10		28x52x10						45	8		32x45x8	•	
30	40	7		30x40x7	•					47	6		32x47x6	
	42	6		30x42x6						47	7		32x47x7	•
	42	7		30x42x7	•					47	8		32x47x8	•
	42	8		30x42x8						47	10		32x47x10	
30	44	7		30x44x7						48	8		32x48x8	

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.	50	8	32×50×8		36 cont.	58	10	36×58×10			
	50	10	32×50×10			62	7	36×62×7			
	52	7	32×52×7	•		37	50	6	37×50×6		
	52	8	32×52×8	•			38	50	7	38×50×7	
	55	10	32×55×10			52		7	38×52×7		
	62	10	32×62×10			52		8	38×52×8		
	72	7	32×72×7			54		10	38×54×10		
	80	7	32×80×7			55		7	38×55×7	•	
	33	45	7	33×45×7				55	8	38×55×8	•
		50	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			
	52	8	34×52×8		60	10		38×60×10			
	62	10	34×62×10		62	7	38×62×7	•			
35	45	7	35×45×7		62	8	38×62×8	•			
	47	6	35×47×6		62	10	38×62×10				
	47	7	35×47×7	•	72	10	38×72×10				
	47	8	35×47×8	•	80	8	38×80×8				
	48	8	35×48×8		38,5	58	7	38.5×58×7			
	49	6	35×49×6			40	50	8	40×50×8		
	50	7	35×50×7	•	52		6	40×52×6			
	50	8	35×50×8	•	52		7	40×52×7	•		
	50	10	35×50×10		52		8	40×52×8	•		
	52	7	35×52×7	•	55		7	40×55×7	•		
	52	8	35×52×8	•	55		8	40×55×8	•		
	52	10	35×52×10		56		8	40×56×8			
	55	7	35×55×7	•	58		7	40×58×7			
	55	8	35×55×8	•	58		8	40×58×8			
	55	10	35×55×10		58		10	40×58×10			
	56	10	35×56×10		60	8	40×60×8				
	58	10	35×58×10		60	10	40×60×10				
	60	10	35×60×10		62	6	40×62×6				
	62	7	35×62×7		62	7	40×62×7	•			
	62	8	35×62×8		62	8	40×62×8	•			
	62	10	35×62×10		62	10	40×62×10				
	72	7	35×72×7		65	10	40×65×10				
	72	10	35×72×10		65	12	40×65×12				
	72	12	35×72×12		68	8	40×68×8				
	80	12	35×80×12		68	10	40×68×10				
	36	47	7	36×47×7		70	8	40×70×8			
		50	7	36×50×7		72	7	40×72×7			
		52	7	36×52×7		72	10	40×72×10			
					80	8	40×80×8				
					80	10	40×80×10				
				80	12	40×80×12					

d₁ 40–70 mm



¹⁾ Designation 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: **6x16x5 HMSA10 RG**

²⁾ Design execution differs from the basic design and is indicated by a number, see also **page 102**.

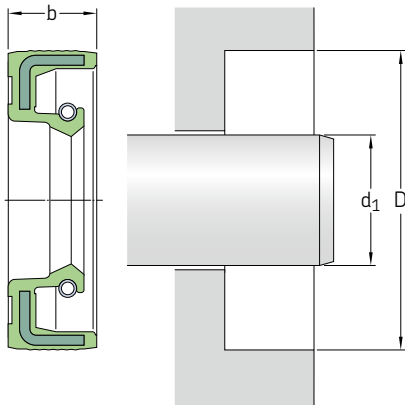


Please see **pages 85 and 86** for housing bore requirements.

Dimensions				Designation ¹⁾	ISO / DIN	Dimensions			
Shaft	Bore	Nominal seal width	b			Shaft	Bore	Nominal seal width	b
d ₁	D								
mm				–	–				–
40	90	10		40x90x10					
cont.	90	12		40x90x12					
41	56	7		41x56x7					
42	53	7		42x53x7					
	55	7		42x55x7	•				
	55	8		42x55x8					
	56	7		42x56x7					
	60	7		42x60x7					
	62	7		42x62x7					
	62	8		42x62x8	•				
	62	10		42x62x10					
	65	10		42x65x10					
	65	12		42x65x12					
	66	10		42x66x10					
	67	10		42x67x10					
	72	8		42x72x8					
	72	10		42x72x10					
43	62	8		43x62x8					
44	60	10		44x60x10					
	62	10		44x62x10					
	65	10		44x65x10					
45	55	7		45x55x7					
	58	7		45x58x7					
	60	7		45x60x7					
	60	8		45x60x8	•				
	60	10		45x60x10					
45	62	7		45x62x7					
cont.	62	8		45x62x8					•
	62	10		45x62x10					
	65	8		45x65x8					•
	65	10		45x65x10					
	68	7		45x68x7					
	68	10		45x68x10					
	68	12		45x68x12					
	72	8		45x72x8					
	72	10		45x72x10					
	75	8		45x75x8					
	75	10		45x75x10					
	80	10		45x80x10					
	85	10		45x85x10					
	100	10		45x100x10					
46	59	12		46x59x12					
	65	10		46x65x10					
47	65	10		47x65x10					
	70	10		47x70x10					
	90	10		47x90x10					
48	62	8		48x62x8					•
	65	10		48x65x10					
	68	10		48x68x10					
	70	10		48x70x10					
	72	7		48x72x7					
	72	8		48x72x8					
	72	10		48x72x10					

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			–	–	
50	62	7	50×62×7		57	67	7	57×67×7		
	64	6	50×64×6			58	72	8	58×72×8	
	65	8	50×65×8	•			80	8	58×80×8	
	65	10	50×65×10				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			82	12	60×82×12		
	75	10	50×75×10			85	8	60×85×8	•	
	80	8	50×80×8			85	10	60×85×10		
	80	10	50×80×10			90	8	60×90×8		
	85	10	50×85×10			90	10	60×90×10		
	90	10	50×90×10			95	10	60×95×10		
	100	10	50×100×10			100	10	60×100×10		
52	63	8	52×63×8		110	8	60×110×8			
	65	8	52×65×8		110	8	60×110×10			
	68	8	52×68×8		62	80	10	62×80×10		
	72	8	52×72×8			85	10	62×85×10		
	72	10	52×72×10			90	10	62×90×10		
	80	10	52×80×10		63	85	10	63×85×10		
	85	10	52×85×10			90	10	63×90×10		
100	10	52×100×10		64	80	8	64×80×8			
55	68	8	55×68×8		65	80	8	65×80×8		
	70	8	55×70×8	•		85	8	65×85×8		
	70	10	55×70×10			85	10	65×85×10	•	
	72	8	55×72×8	•		85	12	65×85×12		
	72	10	55×72×10			88	12	65×88×12		
	75	8	55×75×8			90	10	65×90×10	•	
	75	10	55×75×10			95	10	65×95×10		
	78	10	55×78×10			97	7	65×97×7		
	78	12	55×78×12			100	10	65×100×10		
	80	8	55×80×8	•		110	10	65×110×10		
	80	10	55×80×10			120	12	65×120×12		
	85	8	55×85×8			140	12	65×140×12		
	85	10	55×85×10			68	90	10	68×90×10	
	90	8	55×90×8				70	85	8	70×85×8
90	10	55×90×10								
100	10	55×100×10								
100	12	55×100×12								
56	72	8	56×72×8							

d₁ 70–250 mm



¹⁾ Designation 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, see also **page 102**.



Please see **pages 85 and 86** for housing bore requirements.

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

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			
95 cont.	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			180	12	140×180×12	
	120	12	100×120×12	•	145	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	•
						200	12	150×200×12	
105	130	12	105×130×12	•	155	180	15	155×180×15	
	135	12	105×135×12		160	185	15	160×185×15	
	140	12	105×140×12			190	15	160×190×15	•
108	140	15	108×140×15	•	165	190	15	165×190×15	
	170	15	108×170×15		170	200	15	170×200×15	•
110	130	12	110×130×12	•	175	200	15	175×200×15	
	130	13	110×130×13		180	200	15	180×200×15	
	140	12	110×140×12	•		210	15	180×210×15	•
	150	12	110×150×12		190	220	15	190×220×15	•
115	140	12	115×140×12	•		225	15	190×225×15	
	145	12	115×145×12		200	230	15	200×230×15	•
	150	12	115×150×12		210	240	15	210×240×15	•
118	150	12	118×150×12		220	250	15	220×250×15	•
					230	260	15	230×260×15	•
120	140	12	120×140×12		240	270	15	240×270×15	•
	140	13	120×140×13		250	280	15	250×280×15	•
	150	12	120×150×12			285	15	250×285×15	
	160	12	120×160×12						
	180	15	120×180×15						
125	150	12	125×150×12	•					
	160	15	125×160×15						
	200	15	125×200×15						
130	160	12	130×160×12	•					
	160	15	130×160×15						
	170	12	130×170×12						
	180	12	130×180×12						
	190	12	130×190×12						