

IBC



High-Precision Angular Contact Ball Bearings

with speed-optimized internal design

Series HM 719.. and HM 70..



IBC High-Precision Angular Contact Ball Bearings

IBC HM 719.. and HM 70.. high-precision angular contact ball bearings have been developed in response to the continuing trend of higher speeds in machine tool spindles. These series can reach nearly the same speeds as the H-version and at the same time have almost the same load rating as the standard version. The conflicting goals of speed and load rating can therefore be resolved with this design.

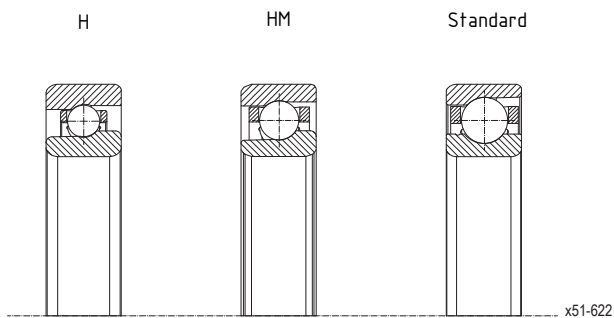


Figure 1: Comparison of internal design for each version

Speeds

The high speed capability is made possible by an optimized internal design. In addition to the slightly reduced ball diameter in comparison with the standard design, the HM design has a more open curvature contact point that produces less friction and thus generates less heat. The high precision of the components, especially the races, also reduces the noise level during operation.

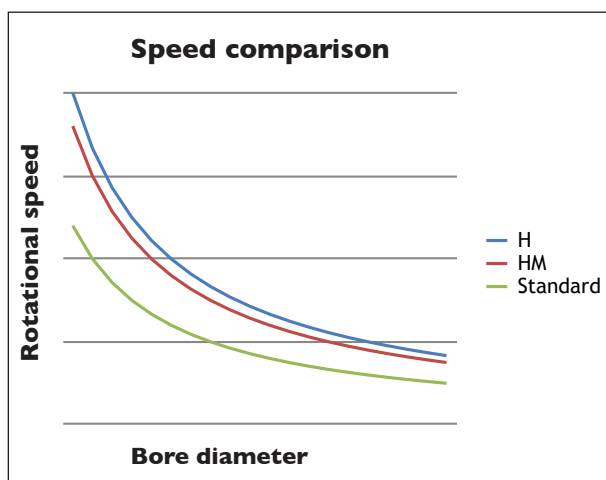


Diagram 1: Qualitative speed comparison

Higher speed increases in comparison with the standard version	Factor
ATCoat-coating (A11 eg. A15)	1,2
Ceramic rolling elements of Si_3N_4	1,3
Oil-air-minimum lubrication	1,4

Table 1: Speed factors for material and lubrication

Load capacities

Load capacities of the HM-versions fall in the middle between of the H-version and the standard version. This is a result of not only the slightly reduced ball diameter, but also the more open curvature contact points.

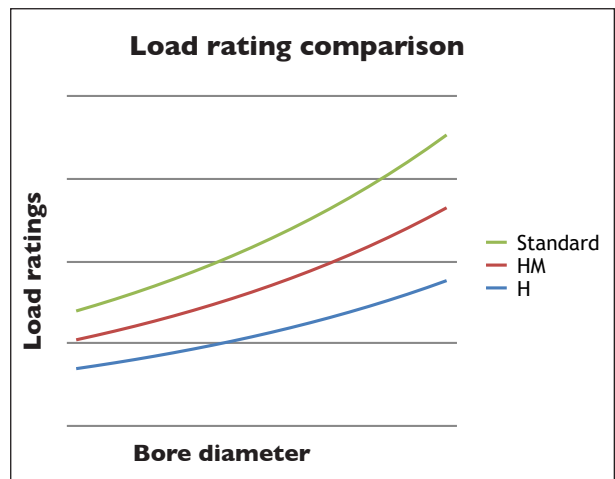


Diagram 2: Qualitative load rating comparison

Technical properties

HM-version high-precision angular contact ball bearings have the following features:

- Series 719.. and 70..
- Contact angle 18° (.C) and 25° (.E)
- Intermediate ball size
- Open curvature contact
- Tolerance class P4A
- Preload classes L, M and H or alternatively custom preload in daN and axial clearance in μm
- Bearing rings made of 100Cr6 steel
- Balls made of 100Cr6 or ceramic Si_3N_4 (CB)
- Window type cage made of phenolic resin (.T)
- Optional non-contacting NBR seals on both sides (.2RSZ)
- ATCoat coating, optional (AC-, ACC-)

Materials and coating

The bearing rings and balls are made of 100Cr6 bearing steel as standard. The optional use of ceramic balls Si_3N_4 (CB) allows for the limiting speed to be increased by a further 30%.

The combination of ceramic balls and an ATCoat coating (ACC-) has proven itself particularly advantageous in practice. This very thin, securely bonded chrome layer has a low coefficient of friction, providing for additional speed increases and lower temperature rise. It also protects against wear and corrosion.

Outer ring located cages made of phenolic resin (.T) are used to guide the balls. Due to its low weight and low friction coefficient, it is suitable for very high speeds.

Lubrication

The HM-version of the high-precision angular contact ball bearing is available with grease lubrication or oil-air minimum lubrication as an option. Tried and tested IBC spindle bearing greases GS36 and GS75, suitable for very high speeds are used with the grease lubrication option. For hybrid bearings in particular, GS39 grease can be used as an alternative. For oil-air minimum lubrication (.S), lubrication holes are made in the outer ring, through which the oil reaches the contact area between the raceway and the balls directly. In addition to increasing the limiting speed by about 40%, oil-air minimum lubrication through the outer race provides better heat dissipation.

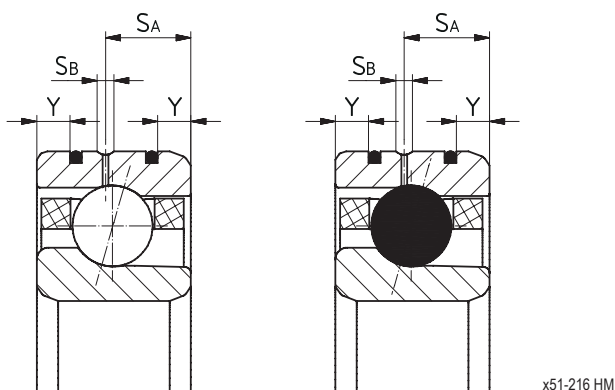


Figure 2: High-precision angular contact ball bearing, HM-version, with oil-air minimum lubrication through the outer ring

Bearing sets

Like the standard and H-versions of the high-precision angular contact ball bearing, the universally ground HM-version is also suitable for installation as a single bearing or a bearing set in O-, X-, and tandem-arrangements. For bearing sets with three or more bearings, these arrangements can be combined with each other, depending on the load conditions. In addition to individual markings that identify the set arrangement directly, the bearing sets have an overall arrow marking on the surface of the outer rings that indicates the main load direction from the inner ring toward the outer ring.

Identification system

The identification system for the HM-version is very similar to other IBC high-precision angular contact ball bearings. Some identification examples are listed below.

IBC identification examples
HM 71911.C.T.2RSZ.P4A.UM
HM 7005.E.S206.T.P4A.UL
CBHM 71908.C.T.P4A.QBTL.GS39
ACC-HM 7014.E.T.P4A.DULA15LF
AC-HM 71911.C.T.P4A.DULA11LF

Table 2: Identification examples

For easier comparison with competitive products, Table 3 gives an overview of the basic identification for each version.

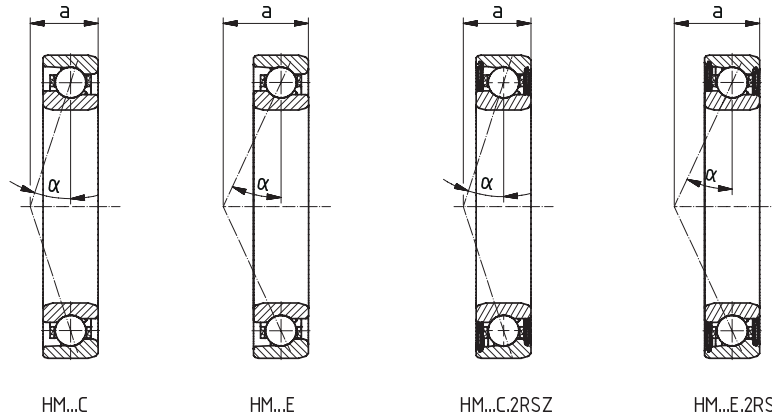
Manufacturer	Designation
IBC	HM
FAG	RS
NSK	BER/BNR
SKF/SNFA	VEB/VEX
NTN	HSE

Table 3: Manufacturer comparison

The HM 719.. series is currently available from bore code 03 to 21, and the HM 70.. series from bore code 03 to 15. Additional sizes are available on request.

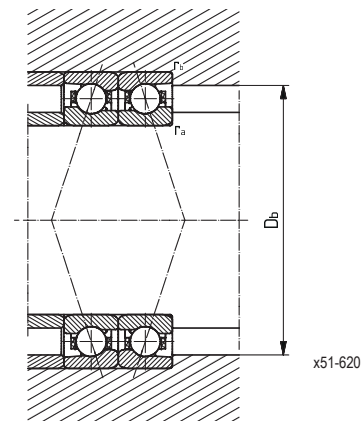
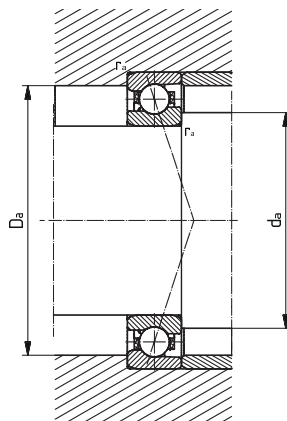
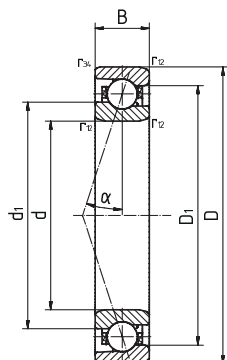
Additional information about high-precision angular contact ball bearings, particularly about tolerances, lifetime, lubrication, mounting, and materials can be found in our main catalog for high-precision bearings TI-I-5050.0 / E.

Series HM 719.. and HM 70..

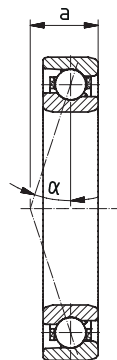


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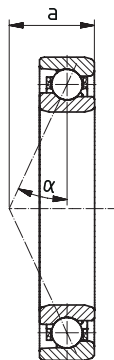
Basic dimensions			Basic designation	Load ratings stat.		Fatigue limit load	Speeds grease oil-air		Effective load centre	Precision locknut
d	D	B		C_r	C_{0r}		n_G	n_O		
mm				N		N	min ⁻¹		a	
									mm	
17	30	7	HM 71903.C	3.200	1.700	63	65.700	99.700	7	MMR 17
			CBHM 71903.C	3.200	1.100	41	85.400	129.700	7	
			HM 71903.E	3.100	1.600	59	57.000	86.500	9	
			CBHM 71903.E	3.100	1.100	41	74.100	112.500	9	
	35	10	HM 7003.C	4.900	2.400	89	59.400	90.100	9	
			CBHM 7003.C	4.900	1.700	63	77.200	117.200	9	
			HM 7003.E	4.700	2.300	85	51.500	78.200	11	
			CBHM 7003.E	4.700	1.600	59	67.000	101.700	11	
20	37	9	HM 71904.C	4.900	2.600	96	54.200	82.200	9	MBA 20
			CBHM 71904.C	4.900	1.800	67	70.400	106.900	9	
			HM 71904.E	4.700	2.500	93	47.000	71.400	11	
			CBHM 71904.E	4.700	1.800	67	61.100	92.800	11	
	42	12	HM 7004.C	6.800	3.600	133	49.800	75.600	11	
			CBHM 7004.C	6.800	2.500	93	64.700	98.300	11	
			HM 7004.E	6.600	3.500	130	43.200	65.600	13	
			CBHM 7004.E	6.600	2.400	89	56.100	85.300	13	
25	42	9	HM 71905.C	5.300	3.200	119	46.100	70.000	10	MBA 25
			CBHM 71905.C	5.300	2.200	81	59.900	91.000	10	
			HM 71905.E	5.100	3.000	111	40.000	60.700	12	
			CBHM 71905.E	5.100	2.100	78	52.000	78.900	12	
	47	12	HM 7005.C	7.500	4.400	163	42.900	65.100	12	
			CBHM 7005.C	7.500	3.100	115	55.700	84.600	12	
			HM 7005.E	7.200	4.200	156	37.200	56.500	14	
			CBHM 7005.E	7.200	2.900	107	48.300	73.400	14	
30	47	9	HM 71906.C	5.600	3.700	137	40.100	60.900	11	MBA 30
			CBHM 71906.C	5.600	2.600	96	52.100	79.100	11	
			HM 71906.E	5.400	3.500	130	34.800	52.800	13	
			CBHM 71906.E	5.400	2.500	93	45.200	68.700	13	
	55	13	HM 7006.C	10.000	6.200	230	36.300	55.100	13	
			CBHM 7006.C	10.000	4.300	159	47.200	71.700	13	
			HM 7006.E	9.600	6.000	222	31.500	47.800	16	
			CBHM 7006.E	9.600	4.200	156	40.900	62.200	16	



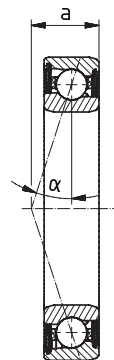
Basic dimensions			Basic designation	Dimensions				Weight m kg	Mounting dimensions				
d	D	B		d ₁	D ₁	r _{12,min}	r _{34,min}		d _{a,min}	D _{a,max}	D _{b,max}	r _{a,max}	r _{b,max}
mm				mm					mm				
17	30	7	HM 71903.C	21,6	25,4	0,3	0,1	0,018	19,8	27,3	28,1	0,3	0,1
			CBHM 71903.C					0,016					
			HM 71903.E	21,6	25,4	0,3	0,1	0,018	19,8	27,3	28,1	0,3	0,1
			CBHM 71903.E					0,016					
	35	10	HM 7003.C	23,5	28,6	0,3	0,1	0,039	21,0	32,1	34,0	0,3	0,1
			CBHM 7003.C					0,037					
			HM 7003.E	23,5	28,6	0,3	0,1	0,039	21,0	32,1	34,0	0,3	0,1
			CBHM 7003.E					0,037					
20	37	9	HM 71904.C	26,2	30,8	0,3	0,2	0,038	24,0	34,5	35,7	0,3	0,2
			CBHM 71904.C					0,035					
			HM 71904.E	26,2	30,8	0,3	0,2	0,038	24,0	34,5	35,7	0,3	0,2
			CBHM 71904.E					0,035					
	42	12	HM 7004.C	28,0	34,0	0,6	0,3	0,071	25,0	37,0	39,5	0,6	0,3
			CBHM 7004.C					0,066					
			HM 7004.E	28,0	34,0	0,6	0,3	0,071	25,0	37,0	39,5	0,6	0,3
			CBHM 7004.E					0,066					
25	42	9	HM 71905.C	31,2	35,8	0,3	0,2	0,044	29,0	39,5	40,7	0,3	0,2
			CBHM 71905.C					0,041					
			HM 71905.E	31,2	35,8	0,3	0,2	0,044	29,0	39,5	40,7	0,3	0,2
			CBHM 71905.E					0,041					
	47	12	HM 7005.C	33,0	39,0	0,6	0,3	0,082	30,0	42,0	44,5	0,6	0,3
			CBHM 7005.C					0,076					
			HM 7005.E	33,0	39,0	0,6	0,3	0,082	30,0	42,0	44,5	0,6	0,3
			CBHM 7005.E					0,076					
30	47	9	HM 71906.C	36,2	40,8	0,3	0,2	0,051	34,0	44,5	45,7	0,3	0,2
			CBHM 71906.C					0,047					
			HM 71906.E	36,2	40,8	0,3	0,2	0,051	34,0	44,5	45,7	0,3	0,2
			CBHM 71906.E					0,047					
	55	13	HM 7006.C	39,1	46,0	1,0	0,3	0,120	36,0	49,0	50,0	1,0	0,3
			CBHM 7006.C					0,110					
			HM 7006.E	39,1	46,0	1,0	0,3	0,120	36,0	49,0	50,0	1,0	0,3
			CBHM 7006.E					0,110					



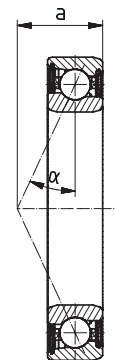
HM...C



HM...E



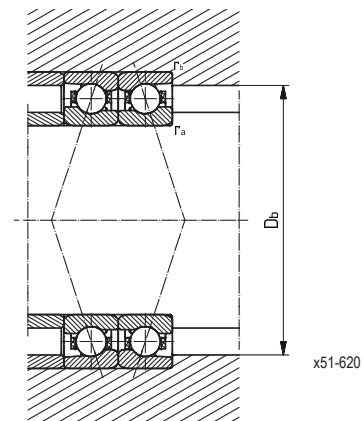
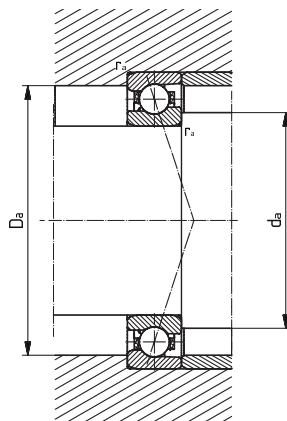
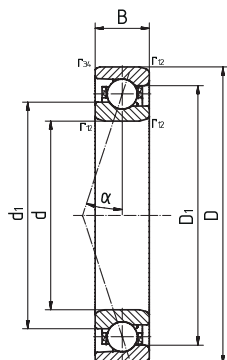
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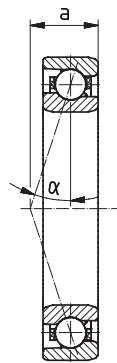
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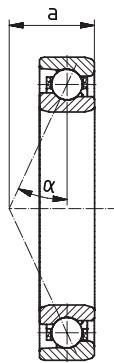
Basic dimensions			Basic designation	Load ratings stat.		Fatigue limit load	Speeds grease oil-air		Effective load centre	Precision locknut
d	D	B		C_r	C_{0r}		n_G	n_O		
mm				N		N	min ⁻¹		a	
									mm	
35	55	10	HM 71907.C	8.600	5.900	219	34.300	52.100	12	MBA 35
			CBHM 71907.C	8.600	4.100	152	44.600	67.700	12	
			HM 71907.E	8.200	5.700	211	29.700	45.200	15	
			CBHM 71907.E	8.200	4.000	148	38.700	58.700	15	
	62	14	HM 7007.C	12.300	7.900	293	31.800	48.300	15	
			CBHM 7007.C	12.300	5.500	204	41.400	62.800	15	
			HM 7007.E	11.800	7.600	281	27.600	41.900	18	
			CBHM 7007.E	11.800	5.300	196	35.900	54.500	18	
40	62	12	HM 71908.C	10.000	7.300	270	30.200	45.900	14	MBA 40
			CBHM 71908.C	10.000	5.100	189	39.300	59.700	14	
			HM 71908.E	9.600	7.000	259	26.200	39.900	18	
			CBHM 71908.E	9.600	4.900	181	34.100	51.800	18	
	68	15	HM 7008.C	13.200	9.200	341	28.600	43.400	16	
			CBHM 7008.C	13.200	6.400	237	37.100	56.400	16	
			HM 7008.E	12.700	8.800	326	24.800	37.600	20	
			CBHM 7008.E	12.700	6.200	230	32.200	48.900	20	
45	68	12	HM 71909.C	10.500	8.200	304	27.300	41.500	15	MBA 45
			CBHM 71909.C	10.500	5.700	211	35.500	53.900	15	
			HM 71909.E	10.000	7.900	293	23.700	36.000	19	
			CBHM 71909.E	10.000	5.500	204	30.800	46.800	19	
	75	16	HM 7009.C	16.000	11.300	419	25.700	39.000	18	
			CBHM 7009.C	16.000	7.900	293	33.400	50.800	18	
			HM 7009.E	15.300	10.900	404	22.300	33.900	22	
			CBHM 7009.E	15.300	7.600	281	29.000	44.000	22	
50	72	12	HM 71910.C	11.000	9.100	337	25.300	38.400	16	MBA 50
			CBHM 71910.C	11.000	6.300	233	32.900	49.900	16	
			HM 71910.E	10.500	8.700	322	21.900	33.300	20	
			CBHM 71910.E	10.500	6.100	226	28.500	43.300	20	
	80	16	HM 7010.C	17.000	12.900	478	23.700	36.000	19	
			CBHM 7010.C	17.000	9.000	333	30.900	46.900	19	
			HM 7010.E	16.300	12.400	459	20.600	31.300	23	
			CBHM 7010.E	16.300	8.600	319	26.800	40.700	23	



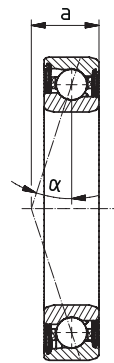
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d	D	B		d ₁	D ₁	r _{12,min}	r _{34,min}		d _{a,min}	D _{a,max}	D _{b,max}	r _{a,max}	r _{b,max}
mm				mm					mm				
35	55	10	HM 71907.C	42,0	48,0	0,6	0,2	0,076	40,0	50,0	52,3	0,6	0,2
			CBHM 71907.C					0,068					
			HM 71907.E	42,0	48,0	0,6	0,2	0,076	40,0	50,0	52,3	0,6	0,2
			CBHM 71907.E					0,068					
	62	14	HM 7007.C	44,7	52,4	1,0	0,3	0,160	41,0	54,0	55,8	1,0	0,3
			CBHM 7007.C					0,140					
			HM 7007.E	44,7	52,4	1,0	0,3	0,160	41,0	54,0	55,8	1,0	0,3
			CBHM 7007.E					0,140					
40	62	12	HM 71908.C	47,8	54,2	0,6	0,2	0,120	45,0	57,0	59,3	0,6	0,2
			CBHM 71908.C					0,110					
			HM 71908.E	47,8	54,2	0,6	0,2	0,120	45,0	57,0	59,3	0,6	0,2
			CBHM 71908.E					0,110					
	68	15	HM 7008.C	50,2	57,9	1,0	0,3	0,200	46,0	61,8	62,8	1,0	0,3
			CBHM 7008.C					0,180					
			HM 7008.E	50,2	57,9	1,0	0,3	0,200	46,0	61,8	62,8	1,0	0,3
			CBHM 7008.E					0,180					
45	68	12	HM 71909.C	53,3	59,7	0,6	0,2	0,140	50,0	63,0	65,4	0,6	0,2
			CBHM 71909.C					0,130					
			HM 71909.E	53,3	59,7	0,6	0,2	0,140	50,0	63,0	65,4	0,6	0,2
			CBHM 71909.E					0,130					
	75	16	HM 7009.C	55,7	64,3	1,0	0,3	0,250	51,0	68,8	70,0	1,0	0,3
			CBHM 7009.C					0,230					
			HM 7009.E	55,7	64,3	1,0	0,3	0,250	51,0	68,8	70,0	1,0	0,3
			CBHM 7009.E					0,230					
50	72	12	HM 71910.C	57,8	64,2	0,6	0,2	0,140	55,0	67,0	69,4	0,6	0,2
			CBHM 71910.C					0,130					
			HM 71910.E	57,8	64,2	0,6	0,2	0,140	55,0	67,0	69,4	0,6	0,2
			CBHM 71910.E					0,130					
	80	16	HM 7010.C	60,7	69,3	1,0	0,3	0,270	56,0	74,0	74,8	1,0	0,3
			CBHM 7010.C					0,250					
			HM 7010.E	60,7	69,3	1,0	0,3	0,270	56,0	74,0	74,8	1,0	0,3
			CBHM 7010.E					0,250					



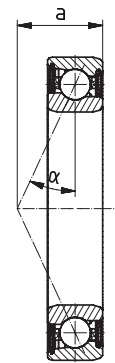
HM...C



HM...E



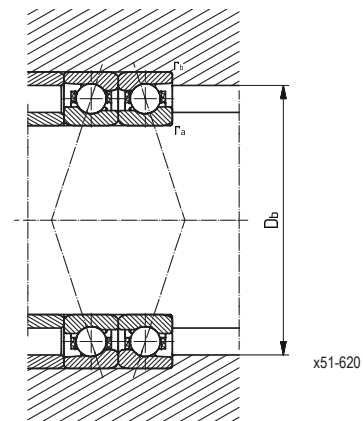
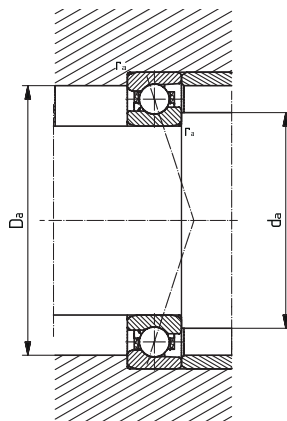
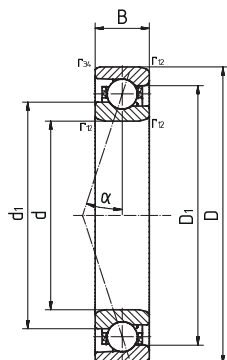
HM...C.2RSZ



HM...E.2RSZ

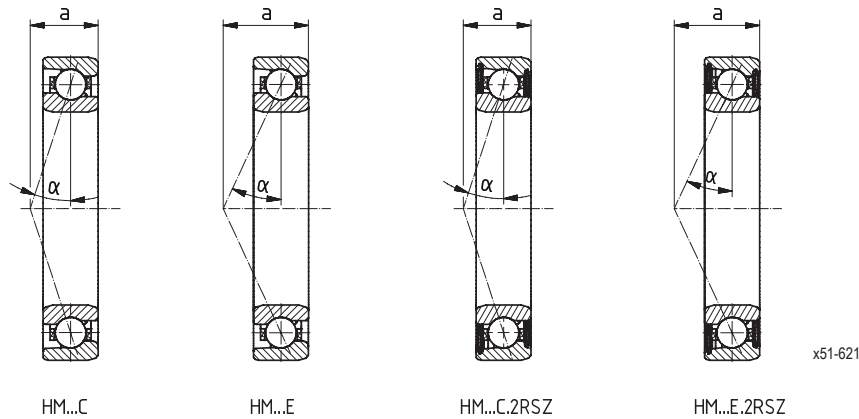
x51-621

Basic dimensions			Basic designation	Load ratings		Fatigue limit load	Speeds		Effective load centre	Precision locknut
d	D	B		C _r	C _{0r}		n _G	n _O		
mm				N		N	min ⁻¹		a	
									mm	
55	80	13	HM 71911.C	13.800	11.600	430	22.800	34.700	17	MBA 55
			CBHM 71911.C	13.800	8.100	300	29.700	45.100	17	
			HM 71911.E	13.200	11.200	415	19.800	30.100	22	
			CBHM 71911.E	13.200	7.800	289	25.800	39.100	22	
	90	18	HM 7011.C	20.800	16.500	611	21.300	32.300	21	
			CBHM 7011.C	20.800	11.500	426	27.700	42.000	21	
			HM 7011.E	19.900	15.800	585	18.400	28.000	26	
			CBHM 7011.E	19.900	11.100	411	24.000	36.400	26	
60	85	13	HM 71912.C	14.400	12.800	474	21.300	32.300	18	MBA 60
			CBHM 71912.C	14.400	8.900	330	27.700	42.000	18	
			HM 71912.E	13.700	12.200	452	18.400	28.000	23	
			CBHM 71912.E	13.700	8.600	319	24.000	36.400	23	
	95	18	HM 7012.C	21.200	17.500	648	19.900	30.200	22	
			CBHM 7012.C	21.200	12.200	452	25.900	39.300	22	
			HM 7012.E	20.300	16.800	622	17.200	26.200	27	
			CBHM 7012.E	20.300	11.700	433	22.400	34.100	27	
65	90	13	HM 71913.C	14.500	13.400	496	19.900	30.200	19	MBA 65
			CBHM 71913.C	14.500	9.400	348	25.900	39.300	19	
			HM 71913.E	13.900	12.800	474	17.200	26.200	25	
			CBHM 71913.E	13.900	9.000	333	22.400	34.100	25	
	100	18	HM 7013.C	21.600	18.500	685	18.700	28.400	22	
			CBHM 7013.C	21.600	12.900	478	24.300	36.900	22	
			HM 7013.E	20.700	17.800	659	16.200	24.600	28	
			CBHM 7013.E	20.700	12.400	459	21.100	32.000	28	
70	100	16	HM 71914.C	19.300	17.700	656	18.100	27.500	22	MBA 70
			CBHM 71914.C	19.300	12.400	459	23.600	35.800	22	
			HM 71914.E	18.500	17.000	630	15.700	23.900	28	
			CBHM 71914.E	18.500	11.900	441	20.400	31.100	28	
	110	20	HM 7014.C	27.500	23.800	881	17.100	26.000	25	
			CBHM 7014.C	27.500	16.600	615	22.300	33.800	25	
			HM 7014.E	26.300	22.800	844	14.800	22.600	31	
			CBHM 7014.E	26.300	15.900	589	19.300	29.300	31	

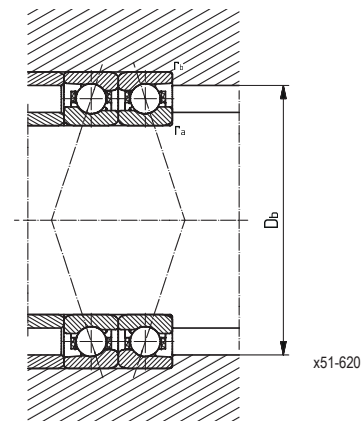
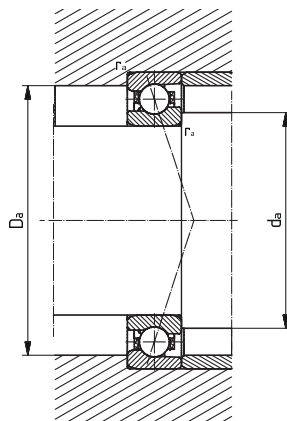
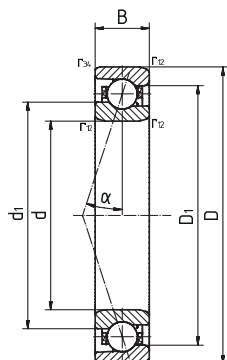


x51-620

Basic dimensions			Basic designation	Dimensions				Weight m kg	Mounting dimensions				
d	D	B		d _l	D _l	r _{12,min}	r _{34,min}		d _{a,min}	D _{a,max}	D _{b,max}	r _{a,max}	r _{b,max}
mm				mm					mm				
55	80	13	HM 71911.C	63,8	71,1	0,6	0,3	0,190	60,0	74,0	75,0	0,6	0,3
			CBHM 71911.C					0,170					
			HM 71911.E	63,8	71,1	0,6	0,3	0,190	60,0	74,0	75,0	0,6	0,3
			CBHM 71911.E					0,170					
	90	18	HM 7011.C	67,8	77,3	1,1	0,6	0,410	61,0	82,8	84,8	1,1	0,6
			CBHM 7011.C					0,380					
			HM 7011.E	67,8	77,3	1,1	0,6	0,410	61,0	82,8	84,8	1,1	0,6
			CBHM 7011.E					0,380					
60	85	13	HM 71912.C	68,8	76,1	0,6	0,3	0,200	65,0	79,0	80,0	0,6	0,3
			CBHM 71912.C					0,180					
			HM 71912.E	68,8	76,1	0,6	0,3	0,200	65,0	79,0	80,0	0,6	0,3
			CBHM 71912.E					0,180					
	95	18	HM 7012.C	72,8	82,3	1,1	0,6	0,430	67,0	88,0	90,0	1,1	0,6
			CBHM 7012.C					0,400					
			HM 7012.E	72,8	82,3	1,1	0,6	0,430	67,0	88,0	90,0	1,1	0,6
			CBHM 7012.E					0,400					
65	90	13	HM 71913.C	73,8	81,1	0,6	0,3	0,220	70,0	84,0	84,8	0,6	0,3
			CBHM 71913.C					0,200					
			HM 71913.E	73,8	81,1	0,6	0,3	0,220	70,0	84,0	84,8	0,6	0,3
			CBHM 71913.E					0,200					
	100	18	HM 7013.C	77,8	87,3	1,1	0,6	0,460	72,0	92,9	95,1	1,1	0,6
			CBHM 7013.C					0,420					
			HM 7013.E	77,8	87,3	1,1	0,6	0,460	72,0	92,9	95,1	1,1	0,6
			CBHM 7013.E					0,420					
70	100	16	HM 71914.C	80,7	89,3	0,6	0,3	0,350	76,0	94,0	94,8	0,6	0,3
			CBHM 71914.C					0,320					
			HM 71914.E	80,7	89,3	0,6	0,3	0,350	76,0	94,0	94,8	0,6	0,3
			CBHM 71914.E					0,320					
	110	20	HM 7014.C	84,6	95,4	1,1	0,6	0,640	77,0	102,7	105,1	1,1	0,6
			CBHM 7014.C					0,590					
			HM 7014.E	84,6	95,4	1,1	0,6	0,640	77,0	102,7	105,1	1,1	0,6
			CBHM 7014.E					0,590					

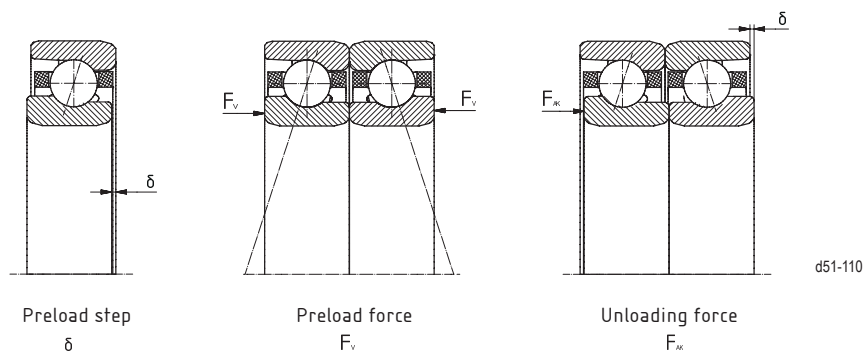


Basic dimensions			Basic designation	Load ratings		Fatigue limit load	Speeds		Effective load centre	Precision locknut
d	D	B		C _r	C _{0r}		n _G	n _O		
mm	mm	mm		N	N	N	min ⁻¹	min ⁻¹	a	
									mm	
75	105	16	HM 71915.C	19.600	18.500	685	17.100	26.000	23	MBA 75
			CBHM 71915.C	19.600	13.000	481	22.300	33.800	23	
			HM 71915.E	18.700	17.800	659	14.800	22.600	29	
			CBHM 71915.E	18.700	12.400	459	19.300	29.300	29	
	115	20	HM 7015.C	28.000	25.000	926	16.200	24.600	25	
			CBHM 7015.C	28.000	17.500	648	21.100	32.000	25	
			HM 7015.E	26.800	24.000	889	14.100	21.400	32	
			CBHM 7015.E	26.800	16.800	622	18.300	27.800	32	
80	110	16	HM 71916.C	20.300	20.100	744	16.200	24.600	23	MBA 80
			CBHM 71916.C	20.300	14.100	522	21.100	32.000	23	
			HM 71916.E	19.400	19.300	715	14.100	21.400	30	
			CBHM 71916.E	19.400	13.500	500	18.300	27.800	30	
85	120	18	HM 71917.C	27.500	26.500	981	15.000	22.800	26	MBA 85
			CBHM 71917.C	27.500	18.600	689	19.500	29.700	26	
			HM 71917.E	26.300	25.400	941	13.000	19.800	33	
			CBHM 71917.E	26.300	17.800	659	16.900	25.800	33	
90	125	18	HM 71918.C	27.900	27.700	1.026	14.300	21.800	26	MBA 90
			CBHM 71918.C	27.900	19.400	719	18.600	28.300	26	
			HM 71918.E	26.700	26.600	985	12.400	18.900	34	
			CBHM 71918.E	26.700	18.600	689	16.200	24.600	34	
95	130	18	HM 71919.C	28.300	28.900	1.070	13.700	20.800	27	MBA 95
			CBHM 71919.C	28.300	20.200	748	17.800	27.000	27	
			HM 71919.E	27.000	27.700	1.026	11.900	18.000	35	
			CBHM 71919.E	27.000	19.400	719	15.400	23.500	35	
100	140	20	HM 71920.C	36.300	36.100	1.337	12.800	19.500	29	MBA 100
			CBHM 71920.C	36.300	25.300	937	16.700	25.400	29	
			HM 71920.E	34.700	34.600	1.281	11.100	16.900	38	
			CBHM 71920.E	34.700	24.200	896	14.500	22.000	38	
105	145	20	HM 71921.C	36.800	37.700	1.396	12.300	18.700	30	MBA 105
			CBHM 71921.C	36.800	26.400	978	16.000	24.300	30	
			HM 71921.E	35.200	36.200	1.341	10.700	16.200	39	
			CBHM 71921.E	35.200	25.300	937	13.900	21.100	39	

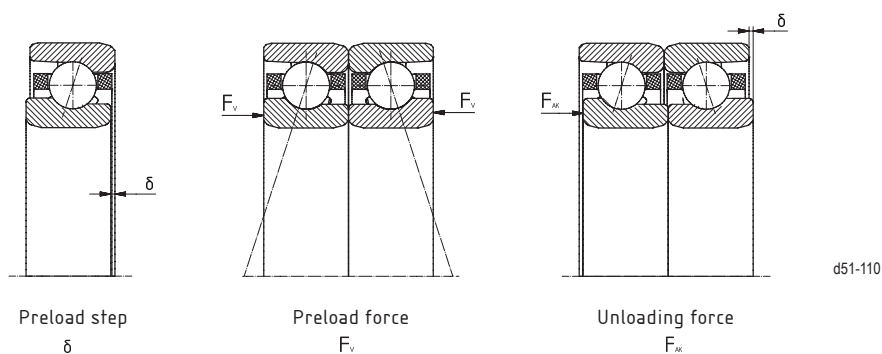


Basic dimensions			Basic designation	Dimensions				Weight m kg	Mounting dimensions				
d	D	B		d _i	D _i	r _{12,min}	r _{34,min}		d _{a,min}	D _{a,max}	D _{b,max}	r _{a,max}	r _{b,max}
mm				mm					mm				
75	105	16	HM 71915.C	85,7	94,3	1,0	0,3	0,370	81,0	99,0	99,9	1,0	0,3
			CBHM 71915.C					0,340					
			HM 71915.E	85,7	94,3	1,0	0,3	0,370	81,0	99,0	99,9	1,0	0,3
			CBHM 71915.E					0,340					
	115	20	HM 7015.C	89,6	100,4	1,1	0,6	0,680	82,0	108,1	110,0	1,1	0,6
			CBHM 7015.C					0,620					
			HM 7015.E	89,6	100,4	1,1	0,6	0,680	82,0	108,1	110,0	1,1	0,6
			CBHM 7015.E					0,620					
80	110	16	HM 71916.C	90,7	99,3	1,0	0,3	0,400	86,0	104,0	104,8	1,0	0,3
			CBHM 71916.C					0,360					
			HM 71916.E	90,7	99,3	1,0	0,3	0,400	86,0	104,0	104,8	1,0	0,3
			CBHM 71916.E					0,360					
85	120	18	HM 71917.C	97,3	107,7	1,1	0,6	0,560	92,0	113,0	114,8	1,1	0,6
			CBHM 71917.C					0,500					
			HM 71917.E	97,3	107,7	1,1	0,6	0,560	92,0	113,0	114,8	1,1	0,6
			CBHM 71917.E					0,500					
90	125	18	HM 71918.C	102,3	112,7	1,1	0,3	0,590	97,0	118,0	119,7	1,1	0,6
			CBHM 71918.C					0,530					
			HM 71918.E	102,3	112,7	1,1	0,3	0,590	97,0	118,0	119,7	1,1	0,6
			CBHM 71918.E					0,530					
95	130	18	HM 71919.C	107,3	117,7	1,1	0,6	0,610	102,0	123,0	124,7	1,1	0,6
			CBHM 71919.C					0,550					
			HM 71919.E	107,3	117,7	1,1	0,6	0,610	102,0	123,0	124,7	1,1	0,6
			CBHM 71919.E					0,550					
100	140	20	HM 71920.C	113,9	126,0	1,1	0,6	0,830	107,0	133,0	134,7	1,1	0,6
			CBHM 71920.C					0,730					
			HM 71920.E	113,9	126,0	1,1	0,6	0,830	107,0	133,0	134,7	1,1	0,6
			CBHM 71920.E					0,730					
105	145	20	HM 71921.C	118,9	131,0	1,1	0,6	0,860	112,0	138,0	139,6	1,1	0,6
			CBHM 71921.C					0,760					
			HM 71921.E	118,9	131,0	1,1	0,6	0,860	112,0	138,0	139,6	1,1	0,6
			CBHM 71921.E					0,760					

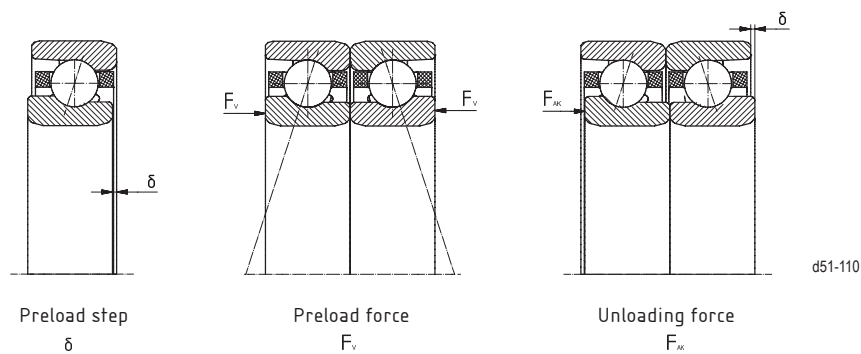
Preloads and Stiffness



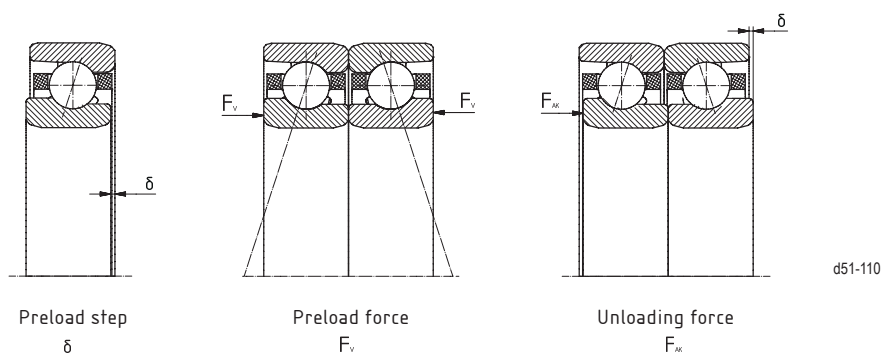
Basic designation	Preloads and Stiffness											
	L				M				H			
	F_v N	S_a N/ μ m	S_r	F_{AK} N	F_v N	S_a N/ μ m	S_r	F_{AK} N	F_v N	S_a N/ μ m	S_r	F_{AK} N
HM 71903.C	15	13	80	40	45	21	100	120	90	25	130	250
CBHM 71903.C	7	11	65	19	21	17	85	55	40	22	100	110
HM 71903.E	23	30	65	65	65	45	95	190	130	60	120	390
CBHM 71903.E	11	25	55	30	30	40	80	90	65	50	100	180
HM 7003.C	21	14	85	55	60	23	110	170	120	30	140	350
CBHM 7003.C	11	12	75	30	30	19	95	90	65	25	110	180
HM 7003.E	30	35	70	90	95	50	100	280	190	70	140	560
CBHM 7003.E	16	30	60	45	45	45	95	130	95	60	120	270
HM 71904.C	21	16	95	55	60	25	120	170	120	30	150	350
CBHM 71904.C	10	13	80	25	30	20	100	80	60	25	120	160
HM 71904.E	30	35	75	85	90	55	110	260	180	75	150	520
CBHM 71904.E	16	35	70	45	45	50	100	130	95	65	130	270
HM 7004.C	25	17	100	80	85	25	130	240	170	35	160	490
CBHM 7004.C	15	15	90	40	45	23	110	120	90	30	130	250
HM 7004.E	40	40	85	120	130	60	120	370	260	80	160	740
CBHM 7004.E	22	35	75	60	65	55	110	180	130	70	140	370
HM 71905.C	25	18	110	70	75	25	140	210	150	40	180	420
CBHM 71905.C	12	16	95	30	35	24	120	100	70	30	140	200
HM 71905.E	35	45	90	100	110	65	130	310	220	85	170	620
CBHM 71905.E	19	40	80	50	55	60	120	160	110	75	150	320
HM 7005.C	35	21	120	100	100	30	160	300	210	45	200	610
CBHM 7005.C	18	18	100	50	50	25	130	150	100	35	160	300
HM 7005.E	50	50	100	150	160	75	150	450	320	100	200	910
CBHM 7005.E	25	45	90	75	80	65	130	220	160	85	170	450
HM 71906.C	25	21	120	80	85	30	160	240	170	45	200	490
CBHM 71906.C	14	18	110	35	40	25	130	110	80	35	160	230
HM 71906.E	40	50	100	120	120	75	150	360	250	100	200	730
CBHM 71906.E	22	45	90	60	65	65	130	180	130	85	170	370
HM 7006.C	45	25	150	120	130	35	190	380	270	50	230	760
CBHM 7006.C	22	21	130	60	65	30	160	180	130	40	190	370
HM 7006.E	65	60	120	180	190	90	180	550	390	110	230	1.100
CBHM 7006.E	30	50	100	90	95	75	150	270	190	100	200	540



Basic designation	Preloads and Stiffness											
	L				M				H			
	F_v N	S_a N/ μ m	S_r	F_{AK} N	F_v N	S_a N/ μ m	S_r	F_{AK} N	F_v N	S_a N/ μ m	S_r	F_{AK} N
HM 71907.C	35	25	150	100	100	35	190	300	210	50	240	610
CBHM 71907.C	18	22	130	50	50	30	160	150	100	40	190	300
HM 71907.E	50	60	120	150	160	90	180	450	320	120	240	910
CBHM 71907.E	25	55	110	75	80	80	160	220	160	100	200	450
HM 7007.C	45	25	160	130	140	40	200	400	280	55	250	810
CBHM 7007.C	24	23	140	65	70	35	170	200	140	45	200	400
HM 7007.E	70	65	130	200	210	95	190	610	430	120	250	1.220
CBHM 7007.E	35	55	110	100	100	85	170	300	210	110	220	610
HM 71908.C	35	25	160	100	110	40	210	320	220	55	250	640
CBHM 71908.C	19	23	140	50	55	35	170	160	110	45	210	320
HM 71908.E	60	65	130	160	180	100	200	500	360	130	260	1.010
CBHM 71908.E	30	60	120	80	90	85	170	250	180	110	220	500
HM 7008.C	55	30	180	150	160	45	230	460	330	60	290	930
CBHM 7008.C	25	25	160	75	80	40	200	230	160	50	230	470
HM 7008.E	80	75	150	230	250	110	220	710	500	140	290	1.420
CBHM 7008.E	40	65	130	110	120	95	190	350	250	120	250	710
HM 71909.C	40	30	180	110	120	45	230	350	250	60	280	710
CBHM 71909.C	21	25	150	55	60	35	190	170	120	50	230	350
HM 71909.E	65	75	150	180	200	110	220	560	400	140	290	1.130
CBHM 71909.E	30	65	130	90	95	95	190	280	190	120	250	560
HM 7009.C	55	30	190	160	170	45	240	500	350	65	300	1.000
CBHM 7009.C	25	25	160	80	85	40	210	240	170	55	240	490
HM 7009.E	90	80	160	260	280	120	240	790	560	150	310	1.590
CBHM 7009.E	45	70	140	130	140	100	210	390	280	130	270	790
HM 71910.C	45	30	200	130	140	50	250	390	280	65	310	790
CBHM 71910.C	23	25	170	65	65	40	210	190	130	55	250	390
HM 71910.E	75	80	160	210	220	120	250	630	450	160	320	1.270
CBHM 71910.E	35	70	140	100	110	100	210	310	220	140	280	620
HM 7010.C	65	35	210	180	190	55	280	560	390	75	330	1.120
CBHM 7010.C	30	30	180	90	95	45	230	280	190	60	270	560
HM 7010.E	100	90	180	290	310	130	270	890	630	170	350	1.790
CBHM 7010.E	50	80	160	140	150	110	230	440	310	150	300	890



Basic designation	Preloads and Stiffness											
	L				M				H			
	F_v N	S_a N/ μ m	S_r N/ μ m	F_{AK} N	F_v N	S_a N/ μ m	S_r N/ μ m	F_{AK} N	F_v N	S_a N/ μ m	S_r N/ μ m	F_{AK} N
HM 71911.C	50	35	210	140	150	50	270	420	300	70	320	840
CBHM 71911.C	25	30	180	70	75	45	230	210	150	60	270	420
HM 71911.E	75	85	170	210	230	130	260	650	460	160	330	1.300
CBHM 71911.E	35	75	150	100	110	110	220	320	220	140	290	640
HM 7011.C	70	35	230	200	210	60	300	610	430	80	360	1.220
CBHM 7011.C	35	30	200	100	100	50	250	300	210	65	300	610
HM 7011.E	100	95	190	300	320	140	290	910	640	180	370	1.830
CBHM 7011.E	50	85	170	150	160	120	250	450	320	160	320	910
HM 71912.C	55	35	230	150	160	55	290	460	330	75	350	930
CBHM 71912.C	25	30	200	75	80	50	250	220	160	65	290	450
HM 71912.E	80	95	190	230	250	140	280	710	500	180	360	1.420
CBHM 71912.E	40	85	170	110	120	120	250	350	250	150	310	710
HM 7012.C	75	40	250	210	220	60	310	640	450	85	380	1.290
CBHM 7012.C	35	35	210	100	110	50	270	320	220	70	310	640
HM 7012.E	110	100	200	320	340	150	300	970	690	190	390	1.950
CBHM 7012.E	55	90	180	160	170	130	260	480	340	170	340	960
HM 71913.C	55	40	240	160	170	60	300	480	340	80	370	960
CBHM 71913.C	25	35	210	80	85	50	260	240	170	65	300	490
HM 71913.E	85	100	200	240	260	140	290	740	520	190	380	1.490
CBHM 71913.E	40	85	170	120	130	130	260	370	260	160	330	740
HM 7013.C	75	40	260	220	230	65	330	670	470	85	400	1.340
CBHM 7013.C	35	35	220	110	110	55	280	330	230	70	330	660
HM 7013.E	120	100	210	340	360	160	320	1.020	720	210	420	2.050
CBHM 7013.E	60	95	190	160	180	140	280	500	360	170	350	1.010
HM 71914.C	75	45	270	210	220	65	340	640	450	90	410	1.290
CBHM 71914.C	35	35	230	100	110	55	290	320	220	75	340	640
HM 71914.E	110	110	220	320	340	160	330	980	690	210	430	1.960
CBHM 71914.E	55	100	200	160	170	140	290	490	340	180	370	980
HM 7014.C	100	45	290	280	300	75	370	850	600	100	450	1.710
CBHM 7014.C	50	40	250	140	150	60	320	430	300	80	370	860
HM 7014.E	150	120	240	430	460	180	360	1.310	930	230	460	2.630
CBHM 7014.E	75	100	210	220	230	160	320	660	460	200	400	1.320



Basic designation	Preloads and Stiffness											
	L				M				H			
	F_v N	S_a N/ μ m	S_r N/ μ m	F_{AK} N	F_v N	S_a N/ μ m	S_r N/ μ m	F_{AK} N	F_v N	S_a N/ μ m	S_r N/ μ m	F_{AK} N
HM 71915.C	75	45	280	220	230	70	360	670	470	95	430	1.340
CBHM 71915.C	40	40	240	110	120	60	300	330	240	80	360	670
HM 71915.E	120	110	230	340	360	170	340	1.030	730	220	450	2.070
CBHM 71915.E	60	100	210	170	180	150	300	510	360	190	390	1.030
HM 7015.C	100	50	310	300	320	75	390	900	640	100	470	1.810
CBHM 7015.C	50	45	270	140	150	65	330	440	310	85	390	890
HM 7015.E	160	120	250	460	490	190	380	1.390	980	240	490	2.780
CBHM 7015.E	80	110	230	230	240	160	330	690	490	210	420	1.390
HM 71916.C	85	50	300	240	250	75	390	730	510	100	470	1.460
CBHM 71916.C	40	40	260	120	120	65	330	360	250	85	390	730
HM 71916.E	130	120	250	370	390	180	370	1.120	790	240	480	2.240
CBHM 71916.E	65	110	220	180	190	160	330	560	390	210	420	1.120
HM 71917.C	110	55	340	320	340	85	430	960	680	110	520	1.930
CBHM 71917.C	55	45	290	160	170	70	360	480	340	95	430	960
HM 71917.E	170	140	280	490	520	200	410	1.470	1.040	260	530	2.950
CBHM 71917.E	85	120	250	240	260	180	360	730	520	230	460	1.470
HM 71918.C	110	55	350	330	350	90	450	1.010	710	120	540	2.020
CBHM 71918.C	55	50	300	160	170	75	380	500	350	100	450	1.000
HM 71918.E	180	140	290	510	540	210	430	1.540	1.090	280	560	3.090
CBHM 71918.E	90	130	260	250	270	190	380	770	540	240	480	1.540
HM 71919.C	120	60	360	350	370	90	460	1.050	740	120	560	2.100
CBHM 71919.C	60	50	320	170	180	75	390	520	370	100	470	1.050
HM 71919.E	190	150	300	530	570	220	450	1.610	1.140	290	580	3.220
CBHM 71919.E	95	130	270	260	280	190	390	800	570	250	500	1.610
HM 71920.C	150	65	390	430	460	100	500	1.310	930	130	610	2.630
CBHM 71920.C	75	55	340	210	230	85	430	650	460	110	500	1.300
HM 71920.E	230	160	330	670	710	240	480	2.010	1.420	310	620	4.020
CBHM 71920.E	110	140	290	330	350	210	420	1.010	710	270	540	2.020
HM 71921.C	160	65	410	450	480	100	520	1.360	960	140	630	2.730
CBHM 71921.C	80	55	350	220	240	85	440	680	480	110	520	1.370
HM 71921.E	240	170	340	690	740	250	500	2.090	1.480	320	650	4.190
CBHM 71921.E	120	150	300	350	370	220	440	1.050	740	280	560	2.100

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