

Spherical Roller Bearings



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Spherical Roller Bearings



Material Prefix

TL: Tough and Long Life
HTF: High Tough
STF: Super Tough
Blank: Standard Materials

Bore Size

(multiply last two numbers by 5 to get bore in mm)
20: 100 mm **48:** 240 mm
32: 160 mm **96:** 480 mm
 500 millimeters and larger written as:
/500: 500 mm **/710:** 710 mm
/630: 630 mm **/1000:** 1000 mm

Bore Type

Blank: Cylindrical Bore
K: 1:12 Tapered Bore
K30: 1:30 Tapered Bore

Internal Clearance

C2: Tight
Blank: Normal
C3: Greater than Normal Clearance
C4: Greater than C3 Clearance

TL

230

72

CAM

K

E4

C3

P55S11

Basic Type

213xx: Spherical Roller, Extra Heavy
222xx: Spherical Roller, Medium
223xx: Spherical Roller, Heavy
230xx: Spherical Roller, Very Light
231xx: Spherical Roller, Light
232xx: Spherical Roller, Medium, Wide
239xx: Spherical Roller, Extra Light
240xx: Spherical Roller, Very Light, Wide
241xx: Spherical Roller, Light, Wide

Cage Options

CAM: One Piece Brass, Guide Ring
C,CD: Two Piece Steel, Guide Ring
EA: High Capacity Steel
H: Two Piece Polyamide
M: Two Piece Brass, Integral Guide Flange

Lubrication Features

E3: Holes Only, Outer
E4: Groove & Holes, Outer
E7: Groove & Holes, Outer & Inner
E8: Outer Ring with Tapped Holes in both Faces for Lifting
Blank: No Relubrication Feature

Other Features

P52: Outer Ring Accuracy
P53: Inner Ring Accuracy
P55: Both Ring Accuracy
U22: Special Inspection Measure
S11: Inner and Outer Ring Heat Stabilized to 200°C
VE: Vibrating Equipment
W507: S11, E4, Special Pkg.
W509: S11, E7, Special Pkg.

Please refer to the bearing tables for exact part number options.

Interchange

Description		Interchange			
		NSK	SKF	TORR/TIMKEN	FAG
Part Number	Very Light	239xx*	239xx	239xx	239xx
	Light	230xx*	230xx	230xx	230xx
	Light, Wide	240xx*	240xx	240xx	240xx
	Medium	231xx*	231xx	231xx	231xx
	Medium, Wide	241xx*	241xx	241xx	241xx
	Heavy	222xx*	222xx	222xx	222xx
	Heavy, Wide	232xx*	232xx	232xx	232xx
	Extra Heavy	213xx*	213xx	213xx	213xx
	Extra Heavy, Wide	223xx*	223xx	223xx	223xx
Part Number Suffix	Brass Cage, One Piece, Guide Ring	CAM, AM	CA, CACM	YM	M, MB, MA
	Brass Cage, Two Piece, Guide Flange	M	MC	BR	--
	Steel Cage, Two Piece, Guide Ring	C, CD	CJ, CC	CJ, VJ	BLANK
	High Capacity Steel Cage	EA	--	--	--
	Polyamide Cage, Two Piece	H	--	VCF	TVPB
	Tapered Bore 1:12	K	K	K	K
	Tapered Bore 1:30	K30	K30	K	K30
	Carburized Steel, Complete Bearing	g	ECD	W40	W209
	Carburized Steel, Inner Ring Only	g3	ECB	W40I	W209B
	Lube Groove & Holes Outer Ring	E4	W33	W33	S
	Lube Groove & Holes Outer Ring, and Inner Ring	E7	W513	W33W94	SH40AB
	Outer Ring, Tapped Holes One Face for Lifting	--	W56	W45A	--
	Outer Ring, Tapped Holes Both Face for Lifting + E4 Feature	E8	--	--	--
	Holes Only Outer Ring	E3	W20	W20	SY
	Inner Ring Lube Groove and Holes	E5	W26	W94	H40AB
	No Relube Features	BLANK	BLANK	BLANK	--
	Plugs Provided for Outer Ring Holes	E42	W77	W84	H40
	Combination W33, W4, W31	W507	W507	W33W4W31	--
	Combination W33, W31	E4U22	W506	W33W31	--
	Combination W33, W26, W31	W509	W509	W33W94W31	SH40A
	Outer Ring with Extra Close Running Accuracy	P52	C04	C04	T52BN
	Inner Ring with Extra Close Running Accuracy	P53	C02	C02	T52BE
	Inner and Outer Ring with Extra Close Running Accuracy	P55	C08	C08	T52BW
	Special Inspection Measures	W31	W31	W31	--
	Inner Ring and Outer Ring Heat Stabilized to 200°C	S11	S1	--	--
	Tight Clearance	C2	C2	C2	C2
	Normal Clearance	BLANK	BLANK	BLANK	BLANK
	Greater than Normal Clearance	C3	C3	C3	C3
	Greater than C3 Clearance	C4	C4	C4	C4

The competitive manufacturers are provided for a convenient source of unit substitution. They can be considered interchangeable in most instances, but for special applications, please consult NSK Engineering. NSK assumes no liability with respect to errors or omissions.

* Indicates NSK **HPS** High Performance Standard Bearing

Applications

Provided below are a few common applications for spherical roller bearings. The spherical roller bearing is designed to handle very heavy loads, even under misalignment or shaft deflection conditions. The spherical shape of the outer ring raceway allows the inner ring to tilt slightly relative to the outer ring without significant loss in bearing life. Spherical roller bearings can also handle axial loading in either direction and heavy shock loads.

- › Continuous Casters (Support Roll, Guide Roll, Pinch Roll, Table Roll) › Other Metal Mill Equipment
- › Shaker Screens and Other Vibratory Equipment › Paper Making Equipment (Calender Rolls, Dryer Rolls, Fourdrinier)
- › Mining Equipment (Drag Lines, Gyrotory Crushers, Continuous Miners, Jaw Crushers) › Blowers and Fans
- › Rubber and Plastic Forming Equipment (Extruders, Granulators) › Pumps and Compressors (Deep Well, Slurry)
- › Gears, Drives and Reducers › Construction Equipment › Oil Field Equipment (Pump Jacks, Compounders, Derricks, Hoists)
- › Overhead Cranes, Crane Hooks, Hoists › Metal Forming Equipment › Railroad Generators and Alternators

Spherical Roller Bearings Radial Internal Clearances

Radial Internal Clearances in Spherical Roller Bearings with Cylindrical Bores

Units: inch

Nominal Bore Diameter d (mm)		Radial Internal Clearance							
		C2		C0		C3		C4	
over	incl.	low	high	low	high	low	high	low	high
24	30	+0.006	+0.010	+0.010	+0.016	+0.016	+0.022	+0.022	+0.030
30	40	+0.006	+0.012	+0.012	+0.018	+0.018	+0.024	+0.024	+0.031
40	50	+0.008	+0.014	+0.014	+0.022	+0.022	+0.030	+0.030	+0.039
50	65	+0.008	+0.016	+0.016	+0.026	+0.026	+0.035	+0.035	+0.047
65	80	+0.012	+0.020	+0.020	+0.031	+0.031	+0.043	+0.043	+0.057
80	100	+0.014	+0.024	+0.024	+0.039	+0.039	+0.053	+0.053	+0.071
100	120	+0.016	+0.030	+0.030	+0.047	+0.047	+0.063	+0.063	+0.083
120	140	+0.020	+0.037	+0.037	+0.057	+0.057	+0.075	+0.075	+0.094
140	160	+0.024	+0.043	+0.043	+0.067	+0.067	+0.087	+0.087	+0.110
160	180	+0.026	+0.047	+0.047	+0.071	+0.071	+0.094	+0.094	+0.122
180	200	+0.028	+0.051	+0.051	+0.079	+0.079	+0.102	+0.102	+0.134
200	225	+0.031	+0.055	+0.055	+0.087	+0.087	+0.114	+0.114	+0.150
225	250	+0.035	+0.059	+0.059	+0.094	+0.094	+0.126	+0.126	+0.165
250	280	+0.039	+0.067	+0.067	+0.102	+0.102	+0.138	+0.138	+0.181
280	315	+0.043	+0.075	+0.075	+0.110	+0.110	+0.146	+0.146	+0.197
315	355	+0.047	+0.079	+0.079	+0.122	+0.122	+0.161	+0.161	+0.217
355	400	+0.051	+0.087	+0.087	+0.134	+0.134	+0.177	+0.177	+0.236
400	450	+0.055	+0.094	+0.094	+0.146	+0.146	+0.197	+0.197	+0.260
450	500	+0.055	+0.102	+0.102	+0.161	+0.161	+0.217	+0.217	+0.283
500	560	+0.059	+0.110	+0.110	+0.173	+0.173	+0.236	+0.236	+0.307
560	630	+0.067	+0.122	+0.122	+0.189	+0.189	+0.256	+0.256	+0.335
630	710	+0.075	+0.138	+0.138	+0.209	+0.209	+0.276	+0.276	+0.362
710	800	+0.083	+0.154	+0.154	+0.228	+0.228	+0.303	+0.303	+0.398
800	900	+0.091	+0.169	+0.169	+0.256	+0.256	+0.339	+0.339	+0.441
900	1000	+0.102	+0.189	+0.189	+0.280	+0.280	+0.366	+0.366	+0.480

Radial Internal Clearances in Spherical Roller Bearings with Tapered Bores

Units: inch

Nominal Bore Diameter d (mm)		Radial Internal Clearance							
		C2		C0		C3		C4	
over	incl.	low	high	low	high	low	high	low	high
24	30	+0.008	+0.012	+0.012	+0.016	+0.016	+0.022	+0.022	+0.030
30	40	+0.010	+0.014	+0.014	+0.020	+0.020	+0.026	+0.026	+0.033
40	50	+0.012	+0.018	+0.018	+0.024	+0.024	+0.031	+0.031	+0.039
50	65	+0.016	+0.022	+0.022	+0.030	+0.030	+0.037	+0.037	+0.047
65	80	+0.020	+0.028	+0.028	+0.037	+0.037	+0.047	+0.047	+0.059
80	100	+0.022	+0.031	+0.031	+0.043	+0.043	+0.055	+0.055	+0.071
100	120	+0.026	+0.039	+0.039	+0.053	+0.053	+0.067	+0.067	+0.087
120	140	+0.031	+0.047	+0.047	+0.063	+0.063	+0.079	+0.079	+0.102
140	160	+0.035	+0.051	+0.051	+0.071	+0.071	+0.091	+0.091	+0.118
160	180	+0.039	+0.055	+0.055	+0.079	+0.079	+0.102	+0.102	+0.134
180	200	+0.043	+0.063	+0.063	+0.087	+0.087	+0.114	+0.114	+0.146
200	225	+0.047	+0.071	+0.071	+0.098	+0.098	+0.126	+0.126	+0.161
225	250	+0.055	+0.079	+0.079	+0.106	+0.106	+0.138	+0.138	+0.177
250	280	+0.059	+0.087	+0.087	+0.118	+0.118	+0.154	+0.154	+0.193
280	315	+0.067	+0.094	+0.094	+0.130	+0.130	+0.169	+0.169	+0.213
315	355	+0.075	+0.106	+0.106	+0.142	+0.142	+0.185	+0.185	+0.232
355	400	+0.083	+0.118	+0.118	+0.157	+0.157	+0.205	+0.205	+0.256
400	450	+0.091	+0.130	+0.130	+0.173	+0.173	+0.224	+0.224	+0.283
450	500	+0.102	+0.146	+0.146	+0.193	+0.193	+0.248	+0.248	+0.311
500	560	+0.114	+0.161	+0.161	+0.213	+0.213	+0.268	+0.268	+0.343
560	630	+0.126	+0.181	+0.181	+0.236	+0.236	+0.299	+0.299	+0.386
630	710	+0.138	+0.201	+0.201	+0.264	+0.264	+0.335	+0.335	+0.429
710	800	+0.154	+0.224	+0.224	+0.295	+0.295	+0.378	+0.378	+0.480
800	900	+0.173	+0.252	+0.252	+0.331	+0.331	+0.421	+0.421	+0.539
900	1000	+0.193	+0.280	+0.280	+0.366	+0.366	+0.469	+0.469	+0.598

Reduction of Radial Clearance for Spherical Roller Bearings with Tapered Bores

Units: inch

Nominal Bore Diameter (mm)		Radial Internal Clearance (Inch)						Reduction in Radial Clearance		Axial Displacement*			
		CN		C3		C4				Taper 1:12		Taper 1:30	
over	incl	min	max	min	max	min	max	min	max	min	max	min	max
30	40	0.0014	0.0020	0.0020	0.0026	0.0026	0.0033	0.0010	0.0012	0.016	0.018	-	-
40	50	0.0018	0.0024	0.0024	0.0031	0.0031	0.0039	0.0012	0.0014	0.018	0.022	-	-
50	65	0.0022	0.0030	0.0030	0.0037	0.0037	0.0047	0.0012	0.0014	0.018	0.022	-	-
65	80	0.0028	0.0037	0.0037	0.0047	0.0047	0.0059	0.0016	0.0018	0.024	0.028	-	-
80	100	0.0031	0.0043	0.0043	0.0055	0.0055	0.0071	0.0018	0.0022	0.028	0.034	0.069	0.085
100	120	0.0039	0.0053	0.0053	0.0067	0.0067	0.0087	0.0020	0.0024	0.030	0.035	0.075	0.089
120	140	0.0047	0.0063	0.0063	0.0079	0.0079	0.0102	0.0024	0.0028	0.035	0.043	0.089	0.108
140	160	0.0051	0.0071	0.0071	0.0091	0.0091	0.0118	0.0026	0.0031	0.039	0.051	0.098	0.128
160	180	0.0055	0.0079	0.0079	0.0102	0.0102	0.0134	0.0028	0.0035	0.043	0.055	0.108	0.138
180	200	0.0063	0.0087	0.0087	0.0114	0.0114	0.0146	0.0031	0.0039	0.051	0.063	0.128	0.157
200	225	0.0071	0.0098	0.0098	0.0126	0.0126	0.0161	0.0035	0.0043	0.055	0.067	0.138	0.167
225	250	0.0079	0.0106	0.0106	0.0138	0.0138	0.0177	0.0039	0.0047	0.063	0.075	0.157	0.187
250	280	0.0087	0.0118	0.0118	0.0154	0.0154	0.0193	0.0043	0.0055	0.067	0.087	0.167	0.217
280	315	0.0094	0.0130	0.0130	0.0169	0.0169	0.0213	0.0047	0.0059	0.075	0.095	0.187	0.236
315	355	0.0106	0.0142	0.0142	0.0185	0.0185	0.0232	0.0055	0.0067	0.087	0.106	0.217	0.266
355	400	0.0118	0.0157	0.0157	0.0205	0.0205	0.0256	0.0059	0.0075	0.095	0.118	0.236	0.295
400	450	0.0130	0.0173	0.0173	0.0224	0.0224	0.0283	0.0067	0.0083	0.106	0.130	0.266	0.325
450	500	0.0146	0.0193	0.0193	0.0248	0.0248	0.0311	0.0075	0.0094	0.118	0.146	0.295	0.364
500	560	0.0161	0.0213	0.0213	0.0268	0.0268	0.0343	0.0083	0.0106	0.134	0.169	0.335	0.433
560	630	0.0181	0.0236	0.0236	0.0299	0.0299	0.0386	0.0091	0.0118	0.146	0.189	0.364	0.472
630	710	0.0201	0.0264	0.0264	0.0335	0.0335	0.0429	0.0102	0.0130	0.165	0.209	0.413	0.512
710	800	0.0224	0.0295	0.0295	0.0378	0.0378	0.0480	0.0110	0.0146	0.177	0.232	0.453	0.591
800	900	0.0252	0.0331	0.0331	0.0421	0.0421	0.0539	0.0122	0.0161	0.197	0.260	0.492	0.650
900	1000	0.0280	0.0366	0.0366	0.0469	0.0469	0.0598	0.0134	0.0181	0.217	0.291	0.551	0.728

*Axial displacement values apply only to solid steel shafts or hollow steel shafts where the bore is equal to or less than one-half of the outside diameter. If the material is other than steel, or if thin walled shafting is used, please consult NSK.

1:12 Taper applies to Series 222, 223, 230, 231, 232, 233 and 239.

1:30 Taper applies to Series 240, 241 and 242.

For Pe less than 0.13Cr, use the lower half of the reduction range. For heavier loads or Pe greater than 0.13Cr, carburized or TL inner rings should be specified and the upper half of the reduction range can be used.

Mounting a Bearing Using Radial Clearance Reduction

Example: The bearing to be mounted is a 22340CAMKE4C3 [200mm bore (40x5) with C3 clearance].

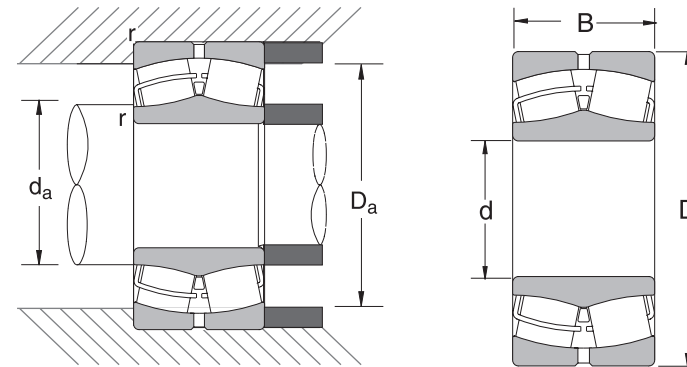
- Using feeler gauges, the clearance in the bearing measures .0090".
- From the "Reduction in Radial Clearance" column in the chart, the reduction in clearance is .0031" to .0039". Subtract these numbers from the measured clearance.

Measured Clearance	.0090"	.0090"
Reduction	<u>.0031"</u>	<u>.0039"</u>
Mounted Clearance	.0059"	.0051"

- Bearing is installed by one of the recommended methods until the clearance in the bearing is within the mounted clearance range. For best results, mount bearing at the middle of the range.

Spherical Roller Bearings: 21300 Series

Bore Diameter 20 – 110 mm, 0.7874 – 4.3307 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r** (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
21304CDE4	20	0.7874	52	2.0472	15	0.5906	0.0394	1.0630	1.1024	1.7717	1.6535
21305CDE4	25	0.9843	62	2.4409	17	0.6693	0.0394	1.2598	1.3386	2.1654	2.0079
21306CDE4	30	1.1811	72	2.8346	19	0.7480	0.0394	1.4567	1.5748	2.5591	2.3228
21307CDE4	35	1.3780	80	3.1496	21	0.8268	0.0591	1.7323	1.8504	2.7953	2.6378
21308EAE4*	40	1.5748	90	3.5433	23	0.9055	0.0591	1.9291	2.2441	3.1890	2.9528
21309EAE4*	45	1.7717	100	3.9370	25	0.9843	0.0591	2.1260	2.6378	3.5827	3.5039
21310EAE4*	50	1.9685	110	4.3307	27	1.0630	0.0787	2.3622	2.8346	3.9370	3.8583
21311EAE4*	55	1.9685	120	4.7244	29	1.1417	0.0787	2.5591	2.8346	4.3307	3.8583
21312EAE4*	60	2.3622	130	5.1181	31	1.2205	0.0787	2.8346	3.4252	4.6457	4.6063
21313EAE4*	65	2.5591	140	5.5118	33	1.2992	0.0787	3.0315	3.7008	5.0394	4.9606
21314EAE4*	70	2.7559	150	5.9055	35	1.3780	0.0787	3.2283	3.9764	5.4331	5.3150
21315EAE4*	75	2.9528	160	6.2992	37	1.4567	0.0787	3.4252	3.9764	5.8268	5.2756
21316EAE4*	80	3.1496	170	6.6929	39	1.5354	0.0787	3.6220	4.2913	6.2205	5.7480
21317EAE4*	85	3.3465	180	7.0866	41	1.6142	0.0984	3.8976	4.2520	6.5354	5.5905
21318EAE4*	90	3.5433	190	7.4803	43	1.6929	0.0984	4.0945	4.5276	6.9291	5.9842
21319CE4*	95	3.7402	200	7.8740	45	1.7717	0.0984	4.2913	5.0000	7.3228	6.7716
21320CE4*	100	3.9370	215	8.4646	47	1.8504	0.0984	4.4882	5.2362	8.2677	7.2441
21322CAME4*	110	4.3307	240	9.4488	50	1.9685	0.0984	4.8819	5.4803	8.8976	8.1102

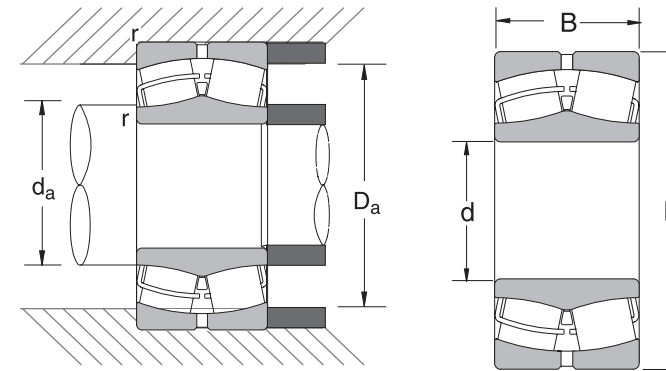
*Indicates NSK (HPS) High Performance Standard bearing.
**Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
	21304CDE4	6600	6050	6300	
21305CDE4	9650	9150	5300	6700	0.57
21306CDE4	12300	12200	4500	6000	0.86
21307CDE4	16000	17100	4000	5300	1.17
21308EAE4*	26500	25000	6000	7500	1.61
21309EAE4*	33500	32500	5000	6300	2.12
21310EAE4*	40000	39000	4500	5600	2.67
21311EAE4*	40000	39000	4500	5600	3.48
21312EAE4*	53500	55000	3800	4800	4.37
21313EAE4*	59500	61500	3600	4500	5.40
21314EAE4*	70000	73500	3200	4000	6.61
21315EAE4*	70000	73500	3200	4000	8.02
21316EAE4*	80000	84000	3000	3800	9.52
21317EAE4*	81000	88500	3000	4000	11.46
21318EAE4*	93000	101000	2800	3600	13.45
21319CE4*	96668	98000	1500	2000	15.25
21320CE4*	111280	109000	1400	1900	18.65
21322CAME4*	127017	123000	1300	1700	24.69

C_r = Dynamic Radial Load Rating C_{0r} = Static Radial Load Rating
*Indicates NSK (HPS) High Performance Standard bearing.

Spherical Roller Bearings: 22200 Series

Bore Diameter 30 – 90 mm, 1.1811 – 3.5433 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r** (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
22206CE4	30	1.1811	62	2.4409	20	0.7874	0.039	1.42	1.45	2.11	2.20
22207CE4	35	1.3780	72	2.8346	23	0.9055	0.039	1.65	1.69	2.46	2.56
22208EAE4*	40	1.5748	80	3.1496	23	0.9055	0.039	1.85	1.95	2.71	2.87
22209EAE4*	45	1.7717	85	3.3465	23	0.9055	0.039	2.05	2.15	2.92	3.07
22210EAE4*	50	1.9685	90	3.5433	23	0.9055	0.039	2.24	2.37	3.14	3.27
22210CAME4	50	1.9685	90	3.5433	23	0.9055	0.039	2.24	2.33	3.12	3.27
22211EAE4*	55	2.1654	100	3.9370	25	0.9843	0.059	2.52	2.59	3.47	3.58
22211CAME4	55	2.1654	100	3.9370	25	0.9843	0.059	2.52	2.60	3.47	3.58
22212EAE4*	60	2.3622	110	4.3307	28	1.1024	0.059	2.72	2.87	3.83	3.98
22212CAME4	60	2.3622	110	4.3307	28	1.1024	0.059	2.72	2.86	3.81	3.98
22213EAE4*	65	2.5590	120	4.7244	31	1.2204	0.059	2.91	3.15	4.21	4.37
22213CAME4	65	2.5591	120	4.7244	31	1.2205	0.059	2.91	3.12	4.14	4.37
22214EAE4*	70	2.7559	125	4.9213	31	1.2205	0.059	3.11	3.30	4.35	4.57
22214CAME4	70	2.7559	125	4.9213	31	1.2205	0.059	3.11	3.28	4.35	4.57
22215EAE4*	75	2.9528	130	5.1181	31	1.2205	0.059	3.31	3.46	4.57	4.76
22215CAME4	75	2.9528	130	5.1181	31	1.2205	0.059	3.31	3.52	4.55	4.76
22216EAE4*	80	3.1496	140	5.5118	33	1.2992	0.078	3.54	3.73	4.91	5.12
22216CAME4	80	3.1496	140	5.5118	33	1.2992	0.078	3.54	3.72	4.86	5.12
22217EAE4*	85	3.3465	150	5.9055	36	1.4173	0.078	3.74	3.99	5.27	5.51
22217CAME4	85	3.3465	150	5.9055	36	1.41730	0.078	3.74	3.98	5.24	5.51
22218EAE4*	90	3.5433	160	6.2992	40	1.57480	0.078	3.94	4.25	5.57	5.91
22218CAME4	90	3.5433	160	6.2992	40	1.57480	0.078	3.94	4.24	5.56	5.91

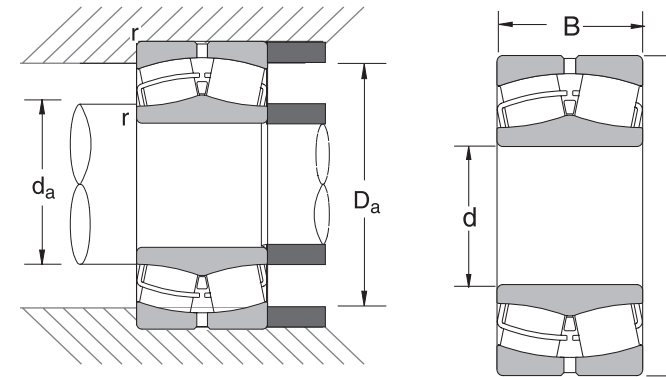
*Indicates NSK (HPS) High Performance Standard bearing.
**Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
	22206CE4	11300	11200	6000	
22207CE4	15500	15900	5300	6700	0.93
22208EAE4*	27800	22300	5600	7100	1.16
22209EAE4*	26500	25000	6000	7500	1.25
22210EAE4*	27800	26700	5600	7100	1.34
22210CAME4	18500	20900	4000	5000	1.28
22211EAE4*	33500	32500	5300	6700	1.78
22211CAME4	23400	27600	3600	4500	1.79
22212EAE4*	40000	39000	4800	6000	2.42
22212CAME4	28500	34500	3200	4000	2.48
22213EAE4*	49500	52000	4300	5300	3.32
22213CAME4	34000	42500	3000	3800	3.34
22214EAE4*	50500	52000	4000	5300	3.48
22214CAME4	36500	46000	2800	3600	3.49
22215EAE4*	53500	55000	4000	5000	3.61
22215CAME4	36500	47500	2800	3400	3.73
22216EAE4*	59500	61500	3600	4500	4.42
22216CAME4	41000	52000	2600	3200	4.47
22217EAE4*	70000	73500	3400	4300	5.59
22217CAME4	48500	62000	2400	3000	5.62
22218EAE4*	81000	88500	3200	4000	7.26
22218CAME4	57500	76500	2200	2800	7.33

C_r = Dynamic Radial Load Rating C_{0r} = Static Radial Load Rating
*Indicates NSK (HPS) High Performance Standard bearing.

Spherical Roller Bearings: 22200 Series (cont.)

Bore Diameter 95 – 320 mm, 3.7402 – 12.5984 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r** (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
22219EAE4*	95	3.7402	170	6.6929	43	1.6929	0.078	4.21	4.52	5.95	6.22
22219CAME4	95	3.7402	170	6.6929	43	1.6929	0.078	4.21	4.47	5.90	6.22
22220EAE4*	100	3.9370	180	7.0866	46	1.8110	0.078	4.41	4.71	6.25	6.61
22220CAME4	100	3.9370	180	7.0866	46	1.8110	0.078	4.41	4.75	6.24	6.61
22222EAE4	110	4.3307	200	7.8740	53	2.0866	0.078	4.80	5.11	6.95	7.40
22222CAME4	110	4.3307	200	7.8740	53	2.0866	0.078	4.80	5.26	6.91	7.40
22224EAE4*	120	4.7244	215	8.4646	58	2.2835	0.078	5.20	5.60	7.46	7.99
22224CAME4	120	4.7244	215	8.4646	58	2.2835	0.078	5.20	5.65	7.42	7.99
22226EAE4*	130	5.1181	230	9.0551	64	2.5197	0.098	5.67	6.02	8.00	8.50
22226CAME4	130	5.1181	230	9.0551	64	2.5197	0.098	5.67	6.14	7.99	8.50
22228CDE4	140	5.5118	250	9.8425	68	2.6772	0.098	6.06	6.59	8.61	9.29
22228CAME4*	140	5.5118	250	9.8425	68	2.6772	0.098	6.06	6.55	8.69	9.29
22230CDE4	150	5.9055	270	10.6299	73	2.8740	0.098	6.46	7.07	9.28	10.08
22230CAME4*	150	5.9055	270	10.6299	73	2.8740	0.098	6.46	7.08	9.28	10.08
22232CDE4	160	6.2992	290	11.4173	80	3.1496	0.098	6.85	7.51	10.02	10.87
22232CAME4*	160	6.2992	290	11.4173	80	3.1496	0.098	6.85	7.53	10.02	10.87
22234CDE4	170	6.6929	310	12.2047	86	3.3858	0.118	7.40	8.12	10.62	11.50
22234CAME4*	170	6.6929	310	12.2047	86	3.3858	0.118	7.40	8.14	10.62	11.50
22236CDE4	180	7.0866	320	12.5984	86	3.3858	0.118	7.80	8.37	10.95	11.89
22236CAME4*	180	7.0866	320	12.5984	86	3.3858	0.118	7.80	8.39	10.95	11.89
22238CAME4*	190	7.4803	340	13.3858	92	3.6220	0.118	8.19	8.91	11.63	12.68
22240CAME4*	200	7.8740	360	14.1732	98	3.8583	0.118	8.58	9.47	12.37	13.46
22244CAME4*	220	8.6614	400	15.7480	108	4.2520	0.118	9.37	10.41	13.69	15.04
22248CAME4	240	9.4488	440	17.3228	120	4.7244	0.118	10.16	11.39	15.07	16.61
22252CAME4	260	10.2362	480	18.8976	130	5.1181	0.157	11.10	12.39	16.45	18.03
22256CAME4	280	11.0236	500	19.6850	130	5.1181	0.157	11.89	13.21	17.26	18.82
22260CAME4	300	11.8110	540	21.2598	140	5.5118	0.157	12.68	14.28	18.63	20.39
22264CAME4	320	12.5984	580	22.8346	150	5.9055	0.157	13.46	15.25	19.99	21.97

*Indicates NSK (HPS) High Performance Standard bearing.

**Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
	22219EAE4*	93000	101000	3000	3800
22219CAME4	66500	88500	2000	2600	8.80
22220EAE4*	102000	110000	2800	3600	10.65
22220CAME4	74000	99000	2000	2400	10.80
22222EAE4	136000	145000	2800	3600	15.38
22222CAME4	95500	132000	1800	2200	15.54
22224EAE4*	154000	172000	2400	3000	19.36
22224CAME4	110000	155000	1600	2000	19.42
22226EAE4*	184000	211000	2200	2600	24.20
22226CAME4	127000	183000	1500	1900	24.04
22228CDE4	187715	209000	1400	1700	31.58
22228CAME4*	187715	213000	1400	1700	30.47
22230CDE4	214692	252000	1300	1600	40.22
22230CAME4*	214692	252000	1300	1600	39.68
22232CDE4	256282	297000	1200	1500	50.56
22232CAME4*	256282	297000	1200	1500	49.20
22234CDE4	278763	335000	1100	1400	62.89
22234CAME4*	278763	335000	1100	1400	61.35
22236CDE4	287755	345000	1100	1300	65.86
22236CAME4*	287755	345000	1100	1300	63.97
22238CAME4*	319229	390000	1000	1200	77.49
22240CAME4*	364190	450000	950	1200	93.10
22244CAME4*	440625	545000	850	1000	128.88
22248CAME4	485554	650000	750	950	175.32
22252CAME4	566046	760000	670	850	226.56
22256CAME4	515000	820000	630	800	238.79
22260CAME4	677698	950000	600	750	303.92
22264CAME4	675000	1100000	530	670	379.55

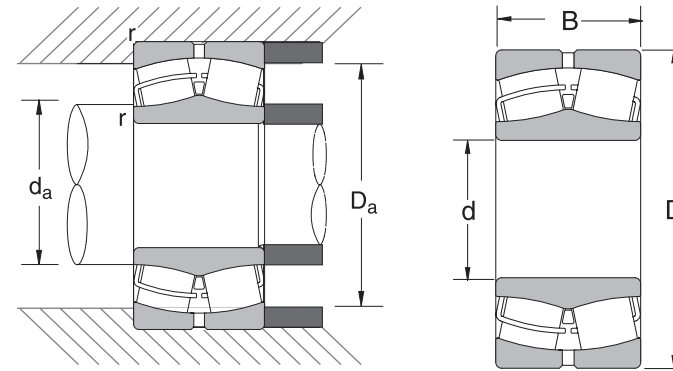
C_r = Dynamic Radial Load Rating

C_{0r} = Static Radial Load Rating

*Indicates NSK (HPS) High Performance Standard bearing.

Spherical Roller Bearings: 22300 Series

Bore Diameter 40 - 95 mm, 1.5748 - 3.7402 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters					
	d		D		B		r** (in)	da (in)		Da (in)		
	mm	inch	mm	inch	mm	inch	max	min	max	min	max	
22308EAE4*	40	1.5748	90	3.5433	33	1.2992	0.059	1.93	1.95	2.96	3.19	
22308CAME4	40	1.5748	90	3.5433	33	1.2992	0.059	1.93	1.96	2.96	3.19	
22309EAE4*	45	1.7717	100	3.9370	36	1.4173	0.059	2.13	2.28	3.33	3.58	
22309CAME4	45	1.7717	100	3.9370	36	1.4173	0.059	2.13	2.30	3.33	3.58	
22310EAE4*	50	1.9685	110	4.3307	40	1.5748	0.078	2.36	2.55	3.62	3.94	
22310CAME4	50	1.9685	110	4.3307	40	1.5748	0.078	2.36	2.46	3.63	3.94	
22311EAE4*	55	2.1654	120	4.7244	43	1.6929	0.078	2.56	2.88	3.99	4.33	
22311CAME4	55	2.1654	120	4.7244	43	1.6929	0.078	2.56	2.74	3.97	4.33	
22312EAE4*	60	2.3622	130	5.1181	46	1.8110	0.078	2.83	3.11	4.32	4.65	
22312CAME4	60	2.3622	130	5.1181	46	1.8110	0.078	2.83	2.97	4.30	4.65	
22313EAE4*	65	2.5591	140	5.5118	48	1.8898	0.078	3.03	3.33	4.64	5.04	
22313CAME4	65	2.5591	140	5.5118	48	1.8898	0.078	3.03	3.24	4.61	5.04	
22314EAE4*	70	2.7559	150	5.9055	51	2.0079	0.078	3.23	3.59	5.01	5.43	
22314CAME4	70	2.7559	150	5.9055	51	2.0079	0.078	3.23	3.48	4.96	5.43	
22315EAE4*	75	2.9528	160	6.2992	55	2.1654	0.078	3.43	3.83	5.33	5.83	
22315CAME4	75	2.9528	160	6.2992	55	2.1654	0.078	3.43	3.71	5.29	5.83	
22316EAE4*	80	3.1496	170	6.6929	58	2.2835	0.078	3.62	4.07	5.66	6.22	
22316CAME4	80	3.1496	170	6.6929	58	2.2835	0.078	3.62	3.94	5.64	6.22	
22317EAE4*	85	3.3465	180	7.0866	60	2.3622	0.098	3.90	4.34	6.06	6.54	
22317CAME4	85	3.3465	180	7.0866	60	2.3622	0.098	3.90	4.22	6.03	6.54	
22318EAE4*	90	3.5433	190	7.4803	64	2.5197	0.098	4.09	4.56	6.38	6.93	
22318CAME4	90	3.5433	190	7.4803	64	2.5197	0.098	4.09	4.34	6.27	6.93	
22319EAE4*	95	3.7402	200	7.8740	67	2.6378	0.098	4.29	4.78	6.72	7.32	
22319CAME4	95	3.7402	200	7.8740	67	2.6378	0.098	4.29	4.70	6.66	7.32	

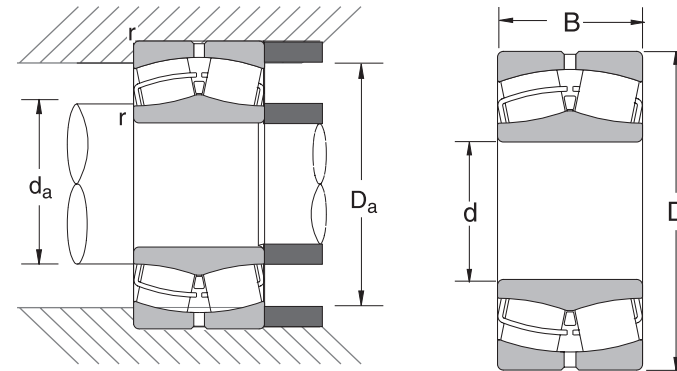
*Indicates NSK (HPS) High Performance Standard bearing.
**Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
22308EAE4*	38000	34500	5300	6700	2.24
22308CAME4	27400	29100	4300	5300	2.17
22309EAE4*	46500	44000	4500	5600	3.05
22309CAME4	33000	37500	3800	4800	2.97
22310EAE4*	55500	52500	4300	5300	3.92
22310CAME4	41500	47500	3600	4300	3.87
22311EAE4*	65500	65500	3800	4800	5.06
22311CAME4	47000	54500	3200	4000	4.93
22312EAE4*	76000	77000	3600	4500	6.36
22312CAME4	55500	65000	3000	3600	6.28
22313EAE4*	84000	85500	3200	4000	7.74
22313CAME4	59500	71500	2800	3400	7.58
22314EAE4*	95500	97500	3000	3800	9.42
22314CAME4	69000	83500	2600	3200	9.24
22315EAE4*	109000	113000	2800	3600	11.57
22315CAME4	76500	93000	2400	3000	11.31
22316EAE4*	122000	128000	2600	3400	13.71
22316CAME4	87500	107000	2200	2800	13.46
22317EAE4*	134000	141000	2400	3200	15.91
22317CAME4	93500	114000	2000	2600	15.55
22318EAE4*	150000	158000	2400	3000	18.83
22318CAME4	109000	134000	2000	2400	18.50
22319EAE4*	165000	175000	2200	2800	21.80
22319CAME4	118000	151000	1900	2400	21.82

C_r = Dynamic Radial Load Rating C_{0r} = Static Radial Load Rating
*Indicates NSK (HPS) High Performance Standard bearing.

Spherical Roller Bearings: 22300 Series (cont.)

Bore Diameter 100 - 320 mm, 3.9370 - 12.5984 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r** (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
22320EAE4*	100	3.9370	215	8.4646	73	2.8740	0.098	4.49	5.12	7.20	7.91
22320CAME4	100	3.9370	215	8.4646	73	2.8740	0.098	4.49	5.11	7.19	7.91
22322EAE4*	110	4.3307	240	9.4488	80	3.1496	0.098	4.88	5.74	8.04	8.90
22322CAME4	110	4.3307	240	9.4488	80	3.1496	0.098	4.88	5.65	7.96	8.90
22324EAE4*	120	4.7244	260	10.2362	86	3.3858	0.098	5.28	6.20	8.70	9.69
22324CAME4	120	4.7244	260	10.2362	86	3.3858	0.098	5.28	6.09	8.61	9.69
22326CE4*	130	5.1181	280	11.0236	93	3.6614	0.118	5.83	6.54	9.28	10.31
22326CAME4*	130	5.1181	280	11.0236	93	3.6614	0.118	5.83	6.57	9.28	10.31
22328CE4*	140	5.5118	300	11.8110	102	4.0157	0.118	6.22	7.00	9.94	11.10
22328CAME4*	140	5.5118	300	11.8110	102	4.0157	0.118	6.22	7.03	9.94	11.10
22330CAME4*	150	5.9055	320	12.5984	108	4.2520	0.118	6.61	7.56	10.61	11.89
22332CAME4*	160	6.2992	340	13.3858	114	4.4882	0.118	7.01	8.05	11.28	12.68
22334CAME4*	170	6.6929	360	14.1732	120	4.7244	0.118	7.40	8.20	11.95	13.46
22336CAME4*	180	7.0866	380	14.9606	126	4.9606	0.118	7.80	8.69	12.66	14.25
22338CAME4*	190	7.4803	400	15.7480	132	5.1969	0.157	8.35	9.17	13.30	14.88
22340CAME4	200	7.8740	420	16.5354	138	5.4331	0.157	8.74	10.12	13.85	15.67
22344CAME4	220	8.6614	460	18.1102	145	5.7087	0.157	9.53	10.90	15.38	17.24
22348CAME4	240	9.4488	500	19.6850	155	6.1024	0.157	10.31	11.91	16.63	18.82
22352CAME4	260	10.2362	540	21.2598	165	6.4961	0.196	11.34	12.89	18.17	20.16
22356CAME4	280	11.0236	580	22.8346	175	6.8898	0.196	12.13	13.88	19.53	21.73
22360CAME4	300	11.8110	620	24.4094	185	7.2835	0.236	13.23	14.85	20.97	22.99
22364CAME4	320	12.5984	670	26.3780	200	7.8740	0.236	14.02	16.01	22.59	24.96

*Indicates NSK (HPS) High Performance Standard bearing.

**Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
	22320EAE4*	194000	209000	2000	2600
22320CAME4	135000	176000	1700	2200	27.52
22322EAE4*	231000	253000	1900	2400	38.72
22322CAME4	166000	221000	1600	1900	38.40
22324EAE4*	268000	296000	1700	2200	48.84
22324CAME4	190000	252000	1400	1800	48.30
22326CE4*	278763	305000	1300	1600	61.46
22326CAME4*	278763	305000	1300	1600	60.72
22328CE4*	325973	360000	1200	1500	77.35
22328CAME4*	325973	360000	1200	1500	75.74
22330CAME4*	343958	380000	1100	1400	90.48
22332CAME4*	382175	425000	1100	1300	107.65
22334CAME4*	442874	475000	1000	1200	126.51
22336CAME4*	487835	525000	950	1200	146.03
22338CAME4*	532797	580000	900	1100	169.29
22340CAME4	519309	670000	850	1000	201.82
22344CAME4	610188	760000	750	950	253.13
22348CAME4	675101	855000	670	850	320.25
22352CAME4	804928	1030000	630	800	396.54
22356CAME4	780000	1160000	560	710	481.94
22360CAME4	885000	1320000	530	670	579.80
22364CAME4	1020000	1540000	480	600	741.39

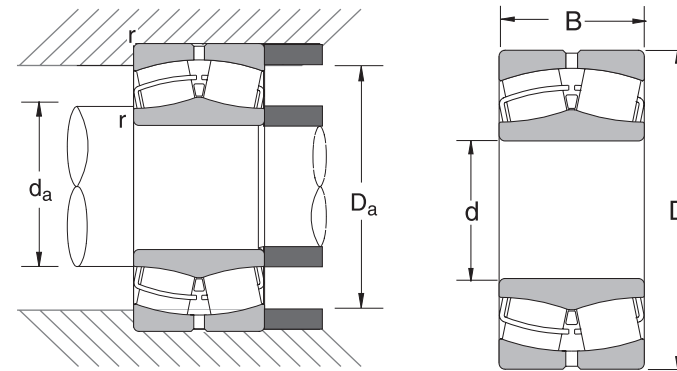
C_r = Dynamic Radial Load Rating

C_{0r} = Static Radial Load Rating

*Indicates NSK (HPS) High Performance Standard bearing.

Spherical Roller Bearings: 23000 Series

Bore Diameter 100 - 480 mm, 3.9370 - 18.8976 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r** (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
23020CDE4	100	3.9370	150	5.9055	37	1.4567	0.059	4.29	4.42	5.34	5.55
23022CDE4	110	4.3307	170	6.6929	45	1.7717	0.078	4.72	4.90	5.99	6.30
23022CAME4	110	4.3307	170	6.6929	45	1.7717	0.078	4.72	4.90	5.99	6.30
23024CDE4	120	4.7244	180	7.0866	46	1.8110	0.078	5.12	5.30	6.39	6.69
23024CAME4*	120	4.7244	180	7.0866	46	1.8110	0.078	5.12	5.30	6.39	6.69
23026CDE4	130	5.1181	200	7.8740	52	2.0472	0.078	5.51	5.78	7.06	7.48
23026CAME4*	130	5.1181	200	7.8740	52	2.0472	0.078	5.51	5.79	7.06	7.48
23028CDE4	140	5.5118	210	8.2677	53	2.0866	0.078	5.91	6.18	7.46	7.87
23028CAME4*	140	5.5118	210	8.2677	53	2.0866	0.078	5.91	6.18	7.46	7.87
23030CDE4	150	5.9055	225	8.8583	56	2.2047	0.078	6.38	6.65	8.00	8.39
23030CAME4*	150	5.9055	225	8.8583	56	2.2047	0.078	6.38	6.65	8.00	8.39
23032CDE4	160	6.2992	240	9.4488	60	2.3622	0.078	6.77	7.06	8.49	8.98
23032CAME4*	160	6.2992	240	9.4488	60	2.3622	0.078	6.77	7.07	8.49	8.98
23034CDE4	170	6.6929	260	10.2362	67	2.6378	0.078	7.17	7.55	9.18	9.76
23034CAME4*	170	6.6929	260	10.2362	67	2.6378	0.078	7.17	7.55	9.18	9.76
23036CDE4	180	7.0866	280	11.0236	74	2.9134	0.078	7.56	7.96	9.78	10.55
23036CAME4*	180	7.0866	280	11.0236	74	2.9134	0.078	7.56	7.97	9.78	10.55
23038CAME4*	190	7.4803	290	11.4173	75	2.9528	0.078	7.95	8.43	10.25	10.94
23040CAME4*	200	7.8740	310	12.2047	82	3.2283	0.078	8.35	9.02	10.95	11.73
23044CAME4*	220	8.6614	340	13.3858	90	3.5433	0.098	9.21	9.79	11.89	12.83
23048CAME4*	240	9.4488	360	14.1732	92	3.6220	0.098	10.00	10.53	12.74	13.62
23052CAME4	260	10.2362	400	15.7480	104	4.0945	0.118	10.94	11.44	13.98	15.04
23056CAME4	280	11.0236	420	16.5354	106	4.1732	0.118	11.73	12.33	14.85	15.83
23060CAME4	300	11.8110	460	18.1102	118	4.6457	0.118	12.52	13.40	16.24	17.40
23064CAME4	320	12.5984	480	18.8976	121	4.7638	0.118	13.31	14.15	16.99	18.19
23068CAME4	340	13.3858	520	20.4724	133	5.2362	0.157	14.25	15.10	18.28	19.61
23072CAME4	360	14.1732	540	21.2598	134	5.2756	0.157	15.04	15.84	19.09	20.39
23076CAME4	380	14.9606	560	22.0472	135	5.3150	0.157	15.83	16.69	19.90	21.18
23080CAME4	400	15.7480	600	23.6220	148	5.8268	0.157	16.61	17.59	21.23	22.76
23084CAME4	420	16.5354	620	24.4094	150	5.9055	0.157	17.40	18.43	22.10	23.54
23088CAME4	440	17.3228	650	25.5906	157	6.1811	0.196	18.43	19.27	23.08	24.49
23092CAME4	460	18.1102	680	26.7717	163	6.4173	0.196	19.21	20.20	24.18	25.67
23096CAME4	480	18.8976	700	27.5591	165	6.4961	0.196	20.00	20.91	24.93	26.46

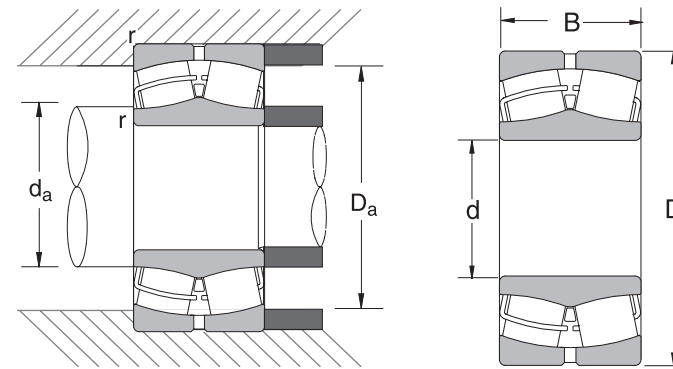
*Indicates NSK (HPS) High Performance Standard bearing. **Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	Cr	Cor	Grease	Oil	
	23020CDE4	47500	75500	2200	2800
23022CDE4	66000	105000	2000	2400	8.18
23022CAME4	66000	105000	2000	2400	7.82
23024CDE4	88800	118000	1800	2200	8.95
23024CAME4*	88800	118000	1800	2200	8.65
23026CDE4	112404	148000	1700	2000	13.00
23026CAME4*	112404	148000	1700	2000	12.65
23028CDE4	118025	161000	1600	1900	14.11
23028CAME4*	118025	161000	1600	1900	13.69
23030CDE4	132637	183000	1400	1800	17.19
23030CAME4*	132637	183000	1400	1800	16.67
23032CDE4	151746	215000	1300	1700	21.05
23032CAME4*	151746	215000	1300	1700	20.53
23034CDE4	178723	246000	1200	1600	28.29
23034CAME4*	178723	246000	1200	1600	27.21
23036CDE4	210196	285000	1200	1400	37.24
23036CAME4*	210196	285000	1200	1400	36.18
23038CAME4*	218065	305000	1100	1400	38.45
23040CAME4*	265275	385000	1000	1300	48.94
23044CAME4*	305740	445000	950	1200	64.70
23048CAME4*	325973	480000	850	1100	71.12
23052CAME4	371306	580000	800	950	101.63
23056CAME4	399868	665000	710	900	110.15
23060CAME4	498536	830000	670	850	154.02
23064CAME4	508922	865000	630	800	164.73
23068CAME4	592012	985000	560	710	220.55
23072CAME4	620574	1060000	530	670	230.81
23076CAME4	649136	1150000	530	630	246.15
23080CAME4	771173	1330000	480	600	318.84
23084CAME4	755594	1310000	450	560	329.35
23088CAME4	817911	1430000	430	530	378.44
23092CAME4	895807	1590000	400	500	438.48
23096CAME4	986686	1790000	400	480	461.25

Cr = Dynamic Radial Load Rating Cor = Static Radial Load Rating
*Indicates NSK (HPS) High Performance Standard bearing.

Spherical Roller Bearings: 23000 Series (cont.)

Bore Diameter 500 - 1250 mm, 19.6850 - 49.2126 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r* (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
230/500CAME4	500	19.6850	720	28.3465	167	6.5748	0.196	20.79	21.78	25.77	27.24
230/530CAME4	530	20.8661	780	30.7087	185	7.2835	0.196	21.97	23.25	27.78	29.61
230/560CAME4	560	22.0472	820	32.2835	195	7.6772	0.196	23.15	24.46	29.19	31.18
230/600CAME4	600	23.6220	870	34.2520	200	7.8740	0.196	24.72	26.43	31.24	33.15
230/630CAME4	630	24.8031	920	36.2205	212	8.3465	0.236	26.22	27.55	32.85	34.80
230/670CAME4	670	26.3780	980	38.5827	230	9.0551	0.236	27.80	29.39	35.08	37.17
230/710CAME4	710	27.9528	1030	40.5512	236	9.2913	0.236	29.37	31.05	36.84	39.13
230/750CAME4	750	29.5276	1090	42.9134	250	9.8425	0.236	30.94	32.78	38.97	41.50
230/800CAME4	800	31.4961	1150	45.2756	258	10.1575	0.236	32.91	34.86	41.13	43.86
230/850CAME4	850	33.4646	1220	48.0315	272	10.7087	0.236	34.88	37.03	43.65	46.61
230/900CAME4	900	35.4331	1280	50.3937	280	11.0236	0.236	36.85	39.09	46.02	48.98
230/950CAME4	950	37.4016	1360	53.5433	300	11.8110	0.236	38.82	41.37	48.83	52.13
230/1000CAME4	1000	39.3701	1420	55.9055	308	12.1260	0.236	40.79	43.42	51.10	54.49
230/1060CAME4	1060	41.7323	1500	59.0551	325	12.7953	0.314	43.46	45.95	53.84	57.32
230/1120CAME4	1120	44.0945	1580	62.2047	345	13.5827	0.314	45.83	48.46	56.83	60.47
230/1250CAME4	1250	49.2126	1750	68.8976	375	14.7638	0.314	50.94	54.11	62.94	67.17

*Maximum fillet which corner radius of bearing will clear.

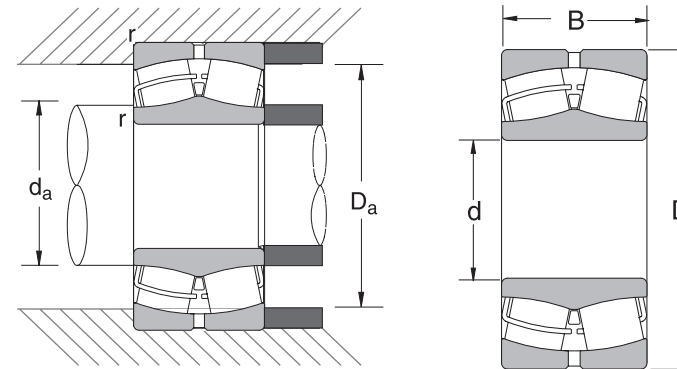
Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
230/500CAME4	973704	1820000	380	480	481
230/530CAME4	1142479	2070000	340	430	652
230/560CAME4	1298271	2400000	320	400	757
230/600CAME4	1415116	2730000	300	360	856
230/630CAME4	1531960	2870000	280	340	1029
230/670CAME4	1778632	3350000	240	320	1256
230/710CAME4	1590000	3550000	240	280	1424
230/750CAME4	2012321	3850000	220	260	1689
230/800CAME4	1870000	4300000	200	240	1913
230/850CAME4	2414785	4800000	180	220	2237
230/900CAME4	2220000	5150000	160	200	2545
230/950CAME4	2934093	5950000	150	190	3091
230/1000CAME4	2680000	6300000	140	170	3440
230/1060CAME4	2930000	7050000	120	160	3928
230/1120CAME4	3450000	8550000	110	140	4674
230/1250CAME4	3900000	9950000	90	110	6086

C_r = Dynamic Radial Load Rating

C_{0r} = Static Radial Load Rating

Spherical Roller Bearings: 23100 Series

Bore Diameter 100 - 380 mm, 3.9370 - 14.9606 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r** (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
23120CE4	100	3.9370	165	6.4961	52	2.0472	0.078	4.33	4.48	5.66	6.10
23120CAME4	100	3.9370	165	6.4961	52	2.0472	0.078	4.33	4.49	5.66	6.10
23122CE4*	110	4.3307	180	7.0866	56	2.2047	0.078	4.72	5.02	6.19	6.69
23122CAME4*	110	4.3307	180	7.0866	56	2.2047	0.078	4.72	5.03	6.19	6.69
23124CE4*	120	4.7244	200	7.8740	62	2.4409	0.078	5.12	5.43	6.86	7.48
23124CAME4*	120	4.7244	200	7.8740	62	2.4409	0.078	5.12	5.44	6.86	7.48
23126CE4*	130	5.1181	210	8.2677	64	2.5197	0.078	5.51	5.87	7.25	7.87
23126CAME4*	130	5.1181	210	8.2677	64	2.5197	0.078	5.51	5.88	7.25	7.87
23128CE4*	140	5.5118	225	8.8583	68	2.6772	0.078	5.98	6.24	7.79	8.39
23128CAME4*	140	5.5118	225	8.8583	68	2.6772	0.078	5.98	6.25	7.79	8.39
23130CE4*	150	5.9055	250	9.8425	80	3.1496	0.078	6.38	6.85	8.57	9.37
23130CAME4*	150	5.9055	250	9.8425	80	3.1496	0.078	6.38	6.86	8.57	9.37
23132CE4*	160	6.2992	270	10.6299	86	3.3858	0.078	6.77	7.30	9.21	10.16
23132CAME4*	160	6.2992	270	10.6299	86	3.3858	0.078	6.77	7.32	9.21	10.16
23134CE4*	170	6.6929	280	11.0236	88	3.4646	0.078	7.17	7.66	9.63	10.55
23134CAME4*	170	6.6929	280	11.0236	88	3.4646	0.078	7.17	7.67	9.63	10.55
23136CE4*	180	7.0866	300	11.8110	96	3.7795	0.098	7.64	8.13	10.24	11.26
23136CAME4*	180	7.0866	300	11.8110	96	3.7795	0.098	7.64	8.13	10.24	11.26
23138CE4*	190	7.4803	320	12.5984	104	4.0945	0.098	8.03	8.64	10.84	12.05
23138CAME4*	190	7.4803	320	12.5984	104	4.0945	0.098	8.03	8.64	10.84	12.05
23140CE4*	200	7.8740	340	13.3858	112	4.4094	0.098	8.43	9.15	11.52	12.83
23140CAME4*	200	7.8740	340	13.3858	112	4.4094	0.098	8.43	9.15	11.52	12.83
23144CE4*	220	8.6614	370	14.5669	120	4.7244	0.118	9.37	10.00	12.58	13.86
23144CAME4*	220	8.6614	370	14.5669	120	4.7244	0.118	9.37	9.99	12.58	13.86
23148CE4*	240	9.4488	400	15.7480	128	5.0394	0.118	10.16	10.83	13.64	15.04
23148CAME4*	240	9.4488	400	15.7480	128	5.0394	0.118	10.16	10.84	13.64	15.04
23152CAME4	260	10.2362	440	17.3228	144	5.6693	0.118	10.94	11.77	14.93	16.61
23156CAME4	280	11.0236	460	18.1102	146	5.7480	0.157	11.89	12.59	15.73	17.24
23160CAME4	300	11.8110	500	19.6850	160	6.2992	0.157	12.68	13.56	17.05	18.82
23164CAME4	320	12.5984	540	21.2598	176	6.9291	0.157	13.46	14.50	18.35	20.39
23168CAME4	340	13.3858	580	22.8346	190	7.4803	0.157	14.25	15.54	19.62	21.97
23172CAME4	360	14.1732	600	23.6220	192	7.5591	0.157	15.04	16.24	20.45	22.76
23176CAME4	380	14.9606	620	24.4094	194	7.6378	0.157	15.83	17.04	21.26	23.54

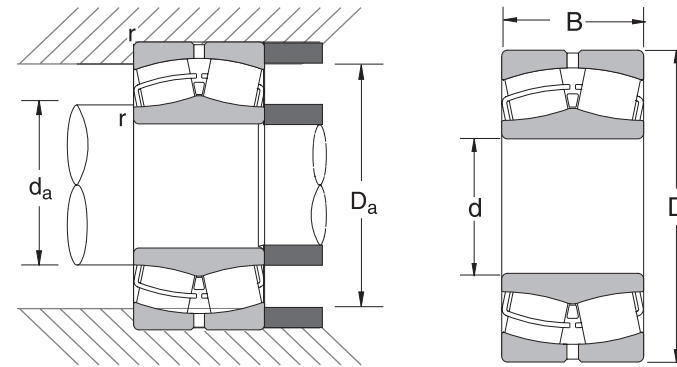
*Indicates NSK (HPS) High Performance Standard bearing. **Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
	23120CE4	78000	119000	1700	
23120CAME4	78000	119000	1700	2200	9.25
23122CE4*	107908	141000	1600	2000	12.40
23122CAME4*	107908	141000	1600	2000	12.03
23124CE4*	130389	162000	1400	1800	17.10
23124CAME4*	130389	162000	1400	1800	16.83
23126CE4*	141630	186000	1300	1700	18.94
23126CAME4*	141630	186000	1300	1700	18.52
23128CE4*	162986	212000	1200	1600	22.92
23128CAME4*	162986	212000	1200	1600	21.92
23130CE4*	203452	266000	1100	1400	34.60
23130CAME4*	203452	266000	1100	1400	33.83
23132CE4*	240546	315000	1000	1300	44.31
23132CAME4*	240546	315000	1000	1300	43.67
23134CE4*	265275	355000	1000	1300	47.52
23134CAME4*	265275	355000	1000	1300	45.73
23136CE4*	296748	395000	900	1200	60.12
23136CAME4*	296748	395000	900	1200	58.80
23138CE4*	332717	455000	850	1100	75.24
23138CAME4*	332717	455000	850	1100	74.15
23140CE4*	382175	525000	800	1000	93.13
23140CAME4*	382175	525000	800	1000	91.18
23144CE4*	440625	610000	710	950	115.82
23144CAME4*	440625	610000	710	950	113.64
23148CE4*	501324	700000	670	850	141.82
23148CAME4*	501324	700000	670	850	139.15
23152CAME4	604286	850000	600	800	192.63
23156CAME4	579029	900000	560	750	205.91
23160CAME4	693277	1080000	500	670	273.31
23164CAME4	791946	1230000	480	600	353.16
23168CAME4	934755	1480000	430	560	450.19
23172CAME4	986686	1590000	400	530	473.33
23176CAME4	1038617	1700000	400	500	499.20

C_r = Dynamic Radial Load Rating C_{0r} = Static Radial Load Rating
*Indicates NSK (HPS) High Performance Standard bearing.

Spherical Roller Bearings: 23100 Series (cont.)

Bore Diameter 400 - 900 mm, 15.7480 - 35.4331 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r* (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
23180CAME4	400	15.7480	650	25.5906	200	7.8740	0.196	16.85	18.00	22.37	24.49
23184CAME4	420	16.5354	700	27.5591	224	8.8189	0.196	17.64	18.98	23.89	26.46
23188CAME4	440	17.3228	720	28.3465	226	8.8976	0.196	18.43	19.75	24.67	27.24
23192CAME4	460	18.1102	760	29.9213	240	9.4488	0.236	19.53	20.72	26.01	28.50
23196CAME4	480	18.8976	790	31.1024	248	9.7638	0.236	20.31	21.58	27.07	29.69
231/500CAME4	500	19.6850	830	32.6772	264	10.3937	0.236	21.10	22.53	28.35	31.26
231/530CAME4	530	20.8661	870	34.2520	272	10.7087	0.236	22.28	23.84	29.82	32.83
231/560CAME4	560	22.0472	920	36.2205	280	11.0236	0.236	23.46	25.23	31.63	34.80
231/600CAME4	600	23.6220	980	38.5827	300	11.8110	0.236	25.04	26.97	33.69	37.17
231/630CAME4	630	24.8031	1030	40.5512	315	12.4016	0.236	26.22	28.33	35.40	39.13
231/670CAME4	670	26.3780	1090	42.9134	336	13.2283	0.236	27.80	30.03	37.45	41.50
231/710CAME4	710	27.9528	1150	45.2756	345	13.5827	0.314	29.69	31.85	39.67	43.54
231/750CAME4	750	29.5276	1220	48.0315	365	14.3701	0.314	31.26	33.81	42.07	46.30
231/800CAME4	800	31.4961	1280	50.3937	375	14.7638	0.314	33.23	35.79	44.34	48.66
231/850CAME4	850	33.4646	1360	53.5433	400	15.7480	0.393	35.59	38.13	47.08	51.42
231/900CAME4	900	35.4331	1420	55.9055	412	16.2205	0.393	37.56	39.90	49.33	53.78

*Maximum fillet which corner radius of bearing will clear.

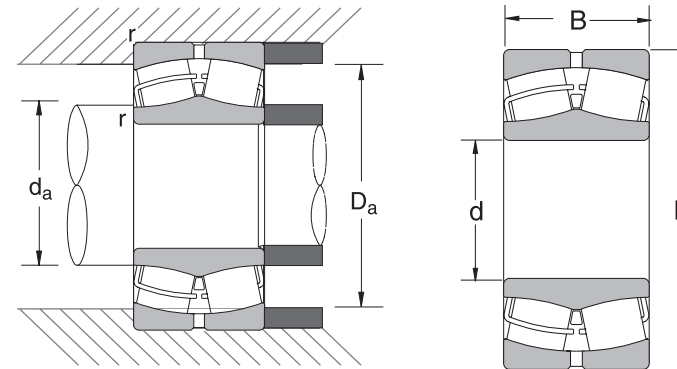
Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
	23180CAME4	1077565	1780000	380	
23184CAME4	1298271	2110000	340	450	745
23188CAME4	1376168	2330000	320	430	788
23192CAME4	1480029	2450000	300	400	925
23196CAME4	1570908	2640000	300	380	1039
231/500CAME4	1778632	3000000	280	360	1241
231/530CAME4	1856528	3150000	260	340	1381
231/560CAME4	2038286	3500000	240	320	1600
231/600CAME4	1970000	3950000	220	280	1976
231/630CAME4	2160000	4350000	200	260	2296
231/670CAME4	2390000	4850000	190	240	2715
231/710CAME4	2660000	5500000	170	220	3114
231/750CAME4	2940000	6150000	160	200	3732
231/800CAME4	3100000	6550000	150	190	4121
231/850CAME4	3550000	7700000	130	170	4979
231/900CAME4	3850000	8300000	120	160	5469

C_r = Dynamic Radial Load Rating

C_{0r} = Static Radial Load Rating

Spherical Roller Bearings: 23200 Series

Bore Diameter 70 - 280 mm, 2.7559 - 11.0236 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r** (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
23214CAME4	70	2.7559	125	4.9213	39.7	1.5630	0.059	3.11	3.26	4.24	4.57
23218CE4	90	3.5433	160	6.2992	52.4	2.0630	0.078	3.94	4.15	5.40	5.91
23218CAME4	90	3.5433	160	6.2992	52.4	2.0630	0.078	3.94	4.16	5.40	5.91
23219CAME4	95	3.7402	170	6.6929	55.6	2.1890	0.078	4.21	4.37	5.74	6.22
23220CE4*	100	3.9370	180	7.0866	60.3	2.3740	0.078	4.41	4.67	6.09	6.61
23220CAME4*	100	3.9370	180	7.0866	60.3	2.3740	0.078	4.41	4.66	6.09	6.61
23222CE4*	110	4.3307	200	7.8740	69.8	2.7480	0.078	4.80	5.12	6.66	7.40
23222CAME4*	110	4.3307	200	7.8740	69.8	2.7480	0.078	4.80	5.13	6.66	7.40
23224CE4*	120	4.7244	215	8.4646	76	2.9921	0.078	5.20	5.52	7.16	7.99
23224CAME4*	120	4.7244	215	8.4646	76	2.9921	0.078	5.20	5.54	7.16	7.99
23226CE4*	130	5.1181	230	9.0551	80	3.1496	0.098	5.67	5.93	7.69	8.50
23226CAME4*	130	5.1181	230	9.0551	80	3.1496	0.098	5.67	5.95	7.69	8.50
23228CE4*	140	5.5118	250	9.8425	88	3.4646	0.098	6.06	6.44	8.38	9.29
23228CAME4*	140	5.5118	250	9.8425	88	3.4646	0.098	6.06	6.46	8.38	9.29
23230CE4*	150	5.9055	270	10.6299	96	3.7795	0.098	6.46	6.96	9.02	10.08
23230CAME4*	150	5.9055	270	10.6299	96	3.7795	0.098	6.46	6.98	9.02	10.08
23232CE4*	160	6.2992	290	11.4173	104	4.0945	0.098	6.85	7.44	9.62	10.87
23232CAME4*	160	6.2992	290	11.4173	104	4.0945	0.098	6.85	7.47	9.62	10.87
23234CE4*	170	6.6929	310	12.2047	110	4.3307	0.118	7.40	7.93	10.28	11.50
23234CAME4*	170	6.6929	310	12.2047	110	4.3307	0.118	7.40	7.94	10.28	11.50
23236CE4*	180	7.0866	320	12.5984	112	4.4094	0.118	7.80	8.33	10.76	11.89
23236CAME4*	180	7.0866	320	12.5984	112	4.4094	0.118	7.80	8.31	10.76	11.89
23238CE4*	190	7.4803	340	13.3858	120	4.7244	0.118	8.19	8.74	11.32	12.68
23238CAME4*	190	7.4803	340	13.3858	120	4.7244	0.118	8.19	8.75	11.32	12.68
23240CE4*	200	7.8740	360	14.1732	128	5.0394	0.118	8.58	9.34	12.08	13.46
23240CAME4*	200	7.8740	360	14.1732	128	5.0394	0.118	8.58	9.35	12.08	13.46
23244CE4*	220	8.6614	400	15.7480	144	5.6693	0.118	9.37	10.25	13.25	15.04
23244CAME4*	220	8.6614	400	15.7480	144	5.6693	0.118	9.37	10.23	13.25	15.04
23248CAME4	240	9.4488	440	17.3228	160	6.2992	0.118	10.16	11.13	14.65	16.61
23252CAME4	260	10.2362	480	18.8976	174	6.8504	0.157	11.10	12.13	15.95	18.03
23256CAME4	280	11.0236	500	19.6850	176	6.9291	0.157	11.89	12.91	16.73	18.82

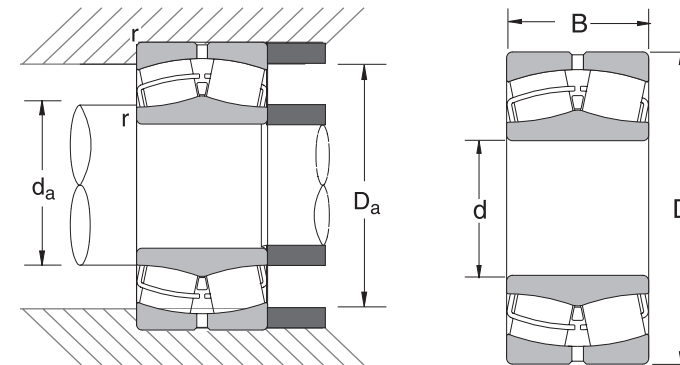
*Indicates NSK (HPS) High Performance Standard bearing. **Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
	23214CAME4	45500	62500	2400	
23218CE4	76500	110000	1800	2400	9.80
23218CAME4	76500	110000	1800	2400	9.66
23219CAME4	83000	118000	1700	2200	11.73
23220CE4*	118025	135000	1600	2200	14.39
23220CAME4*	118025	135000	1600	2200	14.11
23222CE4*	145002	171000	1500	1900	20.78
23222CAME4*	145002	171000	1500	1900	20.54
23224CE4*	177599	218000	1300	1700	26.32
23224CAME4*	177599	218000	1300	1700	25.67
23226CE4*	196708	243000	1200	1600	31.26
23226CAME4*	196708	243000	1200	1600	30.56
23228CE4*	233801	292000	1100	1500	41.01
23228CAME4*	233801	292000	1100	1500	40.12
23230CE4*	274267	350000	1100	1400	52.72
23230CAME4*	274267	350000	1100	1400	51.84
23232CE4*	307988	395000	1000	1300	66.42
23232CAME4*	307988	395000	1000	1300	65.57
23234CE4*	337213	430000	900	1200	79.49
23234CAME4*	337213	430000	900	1200	78.49
23236CE4*	364190	475000	850	1100	84.97
23236CAME4*	364190	475000	850	1100	81.70
23238CE4*	404656	530000	800	1100	104.03
23238CAME4*	404656	530000	800	1100	101.74
23240CE4*	465354	620000	750	1000	124.47
23240CAME4*	465354	620000	750	1000	121.20
23244CE4*	566518	765000	670	900	175.45
23244CAME4*	566518	765000	670	900	172.23
23248CAME4	633556	910000	630	800	231.56
23252CAME4	711453	1020000	560	750	298.14
23256CAME4	747804	1110000	530	670	319.60

C_r = Dynamic Radial Load Rating C_{0r} = Static Radial Load Rating
*Indicates NSK (HPS) High Performance Standard bearing.

Spherical Roller Bearings: 23200 Series (cont.)

Bore Diameter 300 - 950 mm, 11.8110 - 37.4016 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r* (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
23260CAME4	300	11.8110	540	21.2598	192	7.5591	0.157	12.68	13.87	18.00	20.39
23264CAME4	320	12.5984	580	22.8346	208	8.1890	0.157	13.46	14.88	19.21	21.97
23268CAME4	340	13.3858	620	24.4094	224	8.8189	0.196	14.49	15.83	20.49	23.31
23272CAME4	360	14.1732	650	25.5906	232	9.1339	0.196	15.28	16.62	21.59	24.49
23276CAME4	380	14.9606	680	26.7717	240	9.4488	0.196	16.06	17.55	22.74	25.67
23280CAME4	400	15.7480	720	28.3465	256	10.0787	0.196	16.85	18.45	23.99	27.24
23284CAME4	420	16.5354	760	29.9213	272	10.7087	0.236	17.95	19.48	25.34	28.50
23288CAME4	440	17.3228	790	31.1024	280	11.0236	0.236	18.74	20.34	26.31	29.69
23292CAME4	460	18.1102	830	32.6772	296	11.6535	0.236	19.53	21.45	27.63	31.26
23296CAME4	480	18.8976	870	34.2520	310	12.2047	0.236	20.31	22.19	28.86	32.83
232/500CAME4	500	19.6850	920	36.2205	336	13.2283	0.236	21.10	23.36	30.44	34.80
232/530CAME4	530	20.8661	980	38.5827	355	13.9764	0.314	22.60	24.81	32.41	36.85
232/560CAME4	560	22.0472	1030	40.5512	365	14.3701	0.314	23.78	26.29	34.23	38.82
232/600CAME4	600	23.6220	1090	42.9134	388	15.2756	0.314	25.35	28.07	36.32	41.18
232/630CAME4	630	24.8031	1150	45.2756	412	16.2205	0.393	26.93	29.36	38.19	43.15
232/670CAME4	670	26.3780	1220	48.0315	438	17.2441	0.393	28.50	30.94	40.32	45.91
232/710CAME4	710	27.9528	1280	50.3937	450	17.7165	0.393	30.08	32.83	42.51	48.27
232/750CAME4	750	29.5276	1360	53.5433	475	18.7008	0.472	32.05	35.14	45.17	51.02
232/800CAME4	800	31.4961	1420	55.9055	488	19.2126	0.472	34.02	36.70	47.55	53.39
232/850CAME4	850	33.4646	1500	59.0551	515	20.2756	0.472	35.98	38.86	50.16	56.54
232/950CAME4	950	37.4016	1660	65.3543	530	20.8661	0.472	39.92	43.71	56.22	62.83

*Maximum fillet which corner radius of bearing will clear.

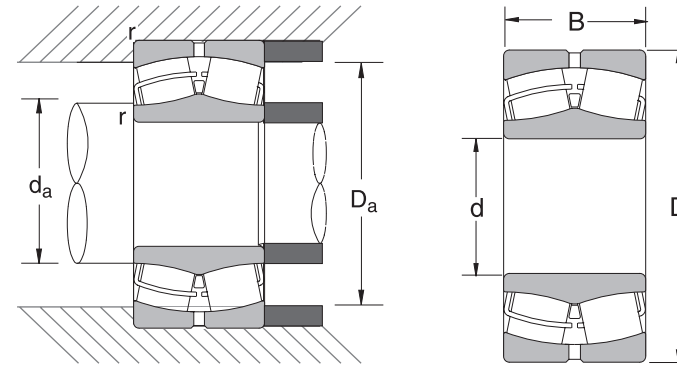
Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{or}	Grease	Oil	
	23260CAME4	882825	1330000	480	
23264CAME4	1012652	1550000	450	600	522
23268CAME4	1142479	1760000	400	530	643
23272CAME4	1246341	1920000	380	500	725
23276CAME4	1337220	2070000	360	480	812
23280CAME4	1300000	2340000	340	450	981
23284CAME4	1674770	2630000	320	430	1168
23288CAME4	1791615	2870000	300	400	1296
23292CAME4	1908459	3100000	280	380	1512
23296CAME4	2038286	3250000	260	360	1742
232/500CAME4	2336889	3750000	260	320	2132
232/530CAME4	2622508	4250000	240	300	2565
232/560CAME4	2830232	4600000	220	280	2911
232/600CAME4	2870000	5600000	200	260	3498
232/630CAME4	3000000	5750000	180	240	4065
232/670CAME4	3350000	6450000	170	220	4857
232/710CAME4	3500000	6850000	160	200	5440
232/750CAME4	3950000	7950000	140	190	6564
232/800CAME4	4550000	9200000	130	170	7156
232/850CAME4	5000000	10200000	120	160	8558
232/950CAME4	5550000	11300000	100	130	10568

C_r = Dynamic Radial Load Rating

C_{or} = Static Radial Load Rating

Spherical Roller Bearings: 23900 Series

Bore Diameter 130 - 750 mm, 5.1181 - 29.5276 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r** (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
23926CAME4	130	5.1181	180	7.0866	37	1.4567	0.059	5.47	5.58	6.51	6.73
23932CAME4*	160	6.2992	220	8.6614	45	1.7717	0.078	6.69	6.86	7.98	8.27
23934BCAME4*	170	6.6929	230	9.0551	45	1.7717	0.078	7.09	7.26	8.38	8.66
23936CAME4*	180	7.0866	250	9.8425	52	2.0472	0.078	7.48	7.75	9.05	9.45
23938CAME4*	190	7.4803	260	10.2362	52	2.0472	0.078	7.87	8.14	9.45	9.84
23940CAME4*	200	7.8740	280	11.0236	60	2.3622	0.078	8.35	8.66	10.15	10.55
23944CAME4*	220	8.6614	300	11.8110	60	2.3622	0.078	9.13	9.42	10.91	11.34
23948CAME4*	240	9.4488	320	12.5984	60	2.3622	0.078	9.92	10.22	11.71	12.13
23952CAME4*	260	10.2362	360	14.1732	75	2.9528	0.078	10.71	11.23	13.09	13.70
23956CAME4	280	11.0236	380	14.9606	75	2.9528	0.078	11.50	12.03	13.80	14.49
23960CAME4	300	11.8110	420	16.5354	90	3.5433	0.098	12.36	13.00	15.17	15.98
23964CAME4	320	12.5984	440	17.3228	90	3.5433	0.098	13.15	13.83	15.98	16.77
23968CAME4	340	13.3858	460	18.1102	90	3.5433	0.098	13.94	14.55	16.78	17.56
23972CAME4	360	14.1732	480	18.8976	90	3.5433	0.098	14.72	15.39	17.58	18.35
23976CAME4	380	14.9606	520	20.4724	106	4.1732	0.118	15.67	16.39	18.95	19.76
23980CAME4	400	15.7480	540	21.2598	106	4.1732	0.118	16.46	17.15	19.71	20.55
23984CAME4	420	16.5354	560	22.0472	106	4.1732	0.118	17.24	17.95	20.52	21.34
23988CAME4	440	17.3228	600	23.6220	118	4.6457	0.118	18.03	18.90	21.83	22.91
23992CAME4	460	18.1102	620	24.4094	118	4.6457	0.118	18.82	19.70	22.63	23.70
23996CAME4	480	18.8976	650	25.5906	128	5.0394	0.157	19.76	20.56	23.68	24.72
239/500CAME4	500	19.6850	670	26.3780	128	5.0394	0.157	20.55	21.37	24.49	25.51
239/530CAME4	530	20.8661	710	27.9528	136	5.3543	0.157	21.73	22.65	25.95	27.09
239/560CAME4	560	22.0472	750	29.5276	140	5.5118	0.157	22.91	23.95	27.44	28.66
239/600CAME4	600	23.6220	800	31.4961	150	5.9055	0.157	24.49	25.60	29.30	30.63
239/630CAME4	630	24.8031	850	33.4646	165	6.4961	0.196	25.91	26.93	30.95	32.36
239/670CAME4	670	26.3780	900	35.4331	170	6.6929	0.196	27.48	28.66	32.92	34.33
239/710CAME4	710	27.9528	950	37.4016	180	7.0866	0.196	29.06	30.45	34.77	36.30
239/750CAME4	750	29.5276	1000	39.3701	185	7.2835	0.196	30.63	32.03	36.65	38.27

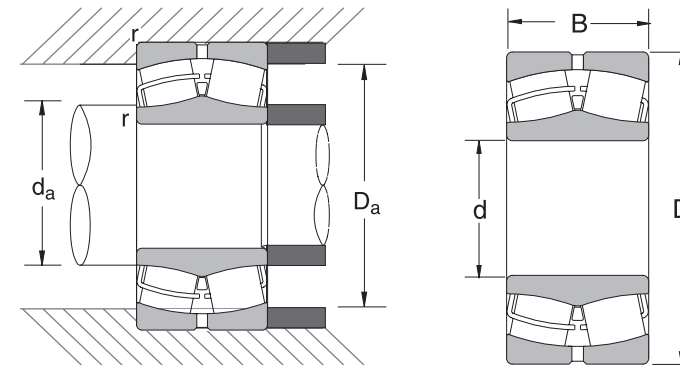
*Indicates NSK (HPS) High Performance Standard bearing. **Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
23926CAME4	54000	95000	1800	2200	6.04
23932CAME4*	101164	152000	1400	1800	10.78
23934BCAME4*	98916	148000	1300	1700	11.69
23936CAME4*	132637	200000	1200	1600	16.61
23938CAME4*	119441	197000	1200	1500	17.46
23940CAME4*	159614	239000	1100	1400	23.96
23944CAME4*	176475	278000	1000	1300	26.57
23948CAME4*	178723	292000	950	1200	28.90
23952CAME4*	263026	420000	850	1000	50.13
23956CAME4	240180	440000	800	950	53.35
23960CAME4	319375	560000	710	900	83.46
23964CAME4	337551	620000	670	850	89.98
23968CAME4	345340	635000	630	800	92.66
23972CAME4	360919	690000	600	750	97.61
23976CAME4	485554	925000	530	670	142.8
23980CAME4	490747	955000	530	630	151.00
23984CAME4	485554	955000	500	600	156.40
23988CAME4	568643	1080000	450	560	211.80
23992CAME4	576433	1110000	430	530	219.20
23996CAME4	669908	1310000	400	500	263.30
239/500CAME4	550000	1250000	400	500	270.90
239/530CAME4	760787	1530000	360	450	326.30
239/560CAME4	804928	1630000	340	430	374.90
239/600CAME4	895807	1830000	320	400	451.20
239/630CAME4	1038617	2100000	300	360	570.40
239/670CAME4	1129496	2320000	260	340	661.00
239/710CAME4	1246341	2640000	240	300	775.00
239/750CAME4	1363185	2880000	220	280	876.40

C_r = Dynamic Radial Load Rating C_{0r} = Static Radial Load Rating
*Indicates NSK (HPS) High Performance Standard bearing.

Spherical Roller Bearings: 23900 Series (cont.)

Bore Diameter 800 - 1400 mm, 31.4961 – 55.1181 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K	1:12 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r* (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
239/800CAME4	800	31.4961	1060	41.7323	195	7.6772	0.196	32.60	34.05	38.86	40.63
239/850CAME4	850	33.4646	1120	44.0945	200	7.8740	0.196	34.57	36.14	41.15	42.99
239/900CAME4	900	35.4331	1180	46.4567	206	8.1102	0.196	36.54	38.23	43.43	45.35
239/950CAME4	950	37.4016	1250	49.2126	224	8.8189	0.236	38.82	40.63	45.99	47.80
239/1000CAME4	1000	39.3701	1320	51.9685	236	9.2913	0.236	40.79	42.82	48.39	50.55
239/1060CAME4	1060	41.7323	1400	55.1181	250	9.8425	0.236	43.15	45.12	51.26	53.70
239/1120CAME4	1120	44.0945	1460	57.4803	250	9.8425	0.236	45.51	47.76	53.73	56.06
239/1180CAME4	1180	46.4567	1540	60.6299	272	10.7087	0.236	47.87	50.11	56.46	59.21
239/1250CAME4	1250	49.2126	1630	64.1732	280	11.0236	0.236	50.63	53.21	60.08	62.76
239/1400CAME4	1400	55.1181	1820	71.6535	315	12.4016	0.314	56.85	59.58	67.04	69.92

*Maximum fillet which corner radius of bearing will clear.

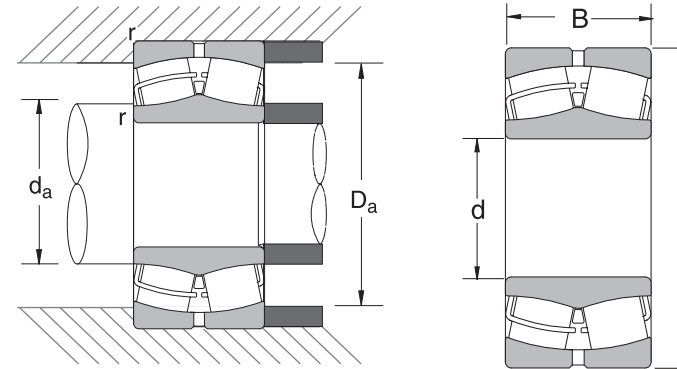
Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
	239/800CAME4	1260000	3100000	220	
239/850CAME4	1583891	3400000	190	240	1151.00
239/900CAME4	1480000	3750000	180	220	1299.00
239/950CAME4	1710000	4500000	160	200	1609.00
239/1000CAME4	1840000	4900000	150	190	1937.00
239/1060CAME4	2090000	5500000	130	170	2263.00
239/1120CAME4	2130000	5850000	120	150	2430.00
239/1180CAME4	2380000	6550000	110	140	2879.00
239/1250CAME4	2600000	7050000	100	120	3355.00
239/1400CAME4	3200000	9100000	80	100	4709.00

C_r = Dynamic Radial Load Rating

C_{0r} = Static Radial Load Rating

Spherical Roller Bearings: 24000 Series

Bore Diameter 100 - 420 mm, 3.9370 - 16.5354 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K30	1:30 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r ^{**} (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch		max	min	max	min
24020CE4	100	3.9370	150	5.9055	50	1.9685	0.059	4.29	4.33	5.20	5.55
24022CE4	110	4.3307	170	6.6929	60	2.3622	0.078	4.72	4.78	5.82	6.30
24024CE4*	120	4.7244	180	7.0866	60	2.3622	0.078	5.12	5.17	6.21	6.69
24024CAME4*	120	4.7244	180	7.0866	60	2.3622	0.078	5.12	5.18	6.21	6.69
24026CE4*	130	5.1181	200	7.8740	69	2.7165	0.078	5.51	5.66	6.87	7.48
24026CAME4*	130	5.1181	200	7.8740	69	2.7165	0.078	5.51	5.66	6.87	7.48
24028CE4*	140	5.5118	210	8.2677	69	2.7165	0.078	5.91	6.07	7.29	7.87
24028CAME4*	140	5.5118	210	8.2677	69	2.7165	0.078	5.91	6.05	7.26	7.87
24030CE4*	150	5.9055	225	8.8583	75	2.9528	0.078	6.38	6.52	7.80	8.39
24030CAME4*	150	5.9055	225	8.8583	75	2.9528	0.078	6.38	6.53	7.80	8.39
24032CE4*	160	6.2992	240	9.4488	80	3.1496	0.078	6.77	6.97	8.33	8.98
24032CAME4*	160	6.2992	240	9.4488	80	3.1496	0.078	6.77	6.98	8.33	8.98
24034CE4*	170	6.6929	260	10.2362	90	3.5433	0.078	7.17	7.43	8.95	9.76
24034CAME4*	170	6.6929	260	10.2362	90	3.5433	0.078	7.17	7.44	8.95	9.76
24036CE4*	180	7.0866	280	11.0236	100	3.9370	0.078	7.56	7.88	9.63	10.55
24036CAME4*	180	7.0866	280	11.0236	100	3.9370	0.078	7.56	7.90	9.63	10.55
24038CE4*	190	7.4803	290	11.4173	100	3.9370	0.078	7.95	8.29	9.95	10.94
24038CAME4*	190	7.4803	290	11.4173	100	3.9370	0.078	7.95	8.28	9.95	10.94
24040CE4*	200	7.8740	310	12.2047	109	4.2913	0.078	8.35	8.78	10.66	11.73
24040CAME4*	200	7.8740	310	12.2047	109	4.2913	0.078	8.35	8.79	10.66	11.73
24044CE4*	220	8.6614	340	13.3858	118	4.6457	0.098	9.21	9.63	11.65	12.83
24044CAME4*	220	8.6614	340	13.3858	118	4.6457	0.098	9.21	9.64	11.65	12.83
24048CE4*	240	9.4488	360	14.1732	118	4.6457	0.098	10.00	10.45	12.49	13.62
24048CAME4*	240	9.4488	360	14.1732	118	4.6457	0.098	10.00	10.45	12.49	13.62
24052CAME4	260	10.2362	400	15.7480	140	5.5118	0.118	10.94	11.32	13.70	15.04
24056CAME4	280	11.0236	420	16.5354	140	5.5118	0.118	11.73	12.17	14.50	15.83
24060CAME4	300	11.8110	460	18.1102	160	6.2992	0.118	12.52	13.08	15.75	17.40
24064CAME4	320	12.5984	480	18.8976	160	6.2992	0.118	13.31	13.90	16.60	18.19
24068CAME4	340	13.3858	520	20.4724	180	7.0866	0.157	14.25	14.90	17.87	19.61
24072CAME4	360	14.1732	540	21.2598	180	7.0866	0.157	15.04	15.67	18.73	20.39
24076CAME4	380	14.9606	560	22.0472	180	7.0866	0.157	15.83	16.46	19.51	21.18
24080CAME4	400	15.7480	600	23.6220	200	7.8740	0.157	16.61	17.33	20.72	22.76
24084CAME4	420	16.5354	620	24.4094	200	7.8740	0.157	17.40	18.18	21.58	23.54

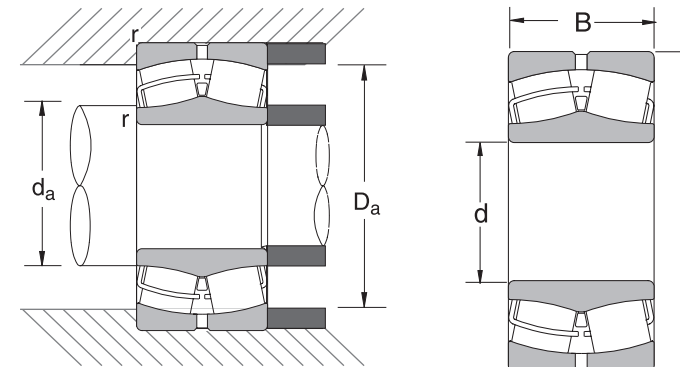
*Indicates NSK (HPS) High Performance Standard bearing. **Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{or}	Grease	Oil	
	24020CE4	62000	106000	1800	2400
24022CE4	85000	145000	1600	2200	10.80
24024CE4*	107908	158000	1500	2000	11.62
24024CAME4*	107908	152000	1500	2000	10.92
24026CE4*	139382	194000	1400	1800	17.05
24026CAME4*	139382	194000	1400	1800	16.46
24028CE4*	142754	213000	1300	1700	18.21
24028CAME4*	142754	204000	1300	1700	17.27
24030CE4*	166359	245000	1200	1500	22.83
24030CAME4*	166359	245000	1200	1500	22.29
24032CE4*	189964	283000	1100	1400	27.62
24032CAME4*	189964	283000	1100	1400	26.95
24034CE4*	231553	340000	1000	1300	37.75
24034CAME4*	231553	340000	1000	1300	36.85
24036CE4*	272019	395000	950	1200	49.51
24036CAME4*	272019	395000	950	1200	48.46
24038CE4*	274267	415000	900	1200	52.32
24038CAME4*	274267	415000	900	1200	50.39
24040CE4*	296006	475000	850	1100	66.32
24040CAME4*	296006	475000	850	1100	63.88
24044CE4*	368687	585000	750	1000	86.66
24044CAME4*	368687	560000	750	1000	83.84
24048CE4*	388919	615000	710	950	92.41
24048CAME4*	388919	615000	710	950	89.81
24052CAME4	469974	790000	630	850	136.50
24056CAME4	488150	855000	600	800	144.80
24060CAME4	599801	1040000	530	710	204.30
24064CAME4	550000	1130000	500	670	217.80
24068CAME4	758190	1360000	480	600	294.80
24072CAME4	660000	1370000	450	600	303.60
24076CAME4	690000	1480000	430	560	323.20
24080CAME4	810000	1710000	400	500	422.60
24084CAME4	973704	1820000	380	480	434.10

C_r = Dynamic Radial Load Rating C_{or} = Static Radial Load Rating
*Indicates NSK (HPS) High Performance Standard bearing.

Spherical Roller Bearings: 24000 Series (cont.)

Bore Diameter 440 - 1400 mm, 17.3228 - 55.1181 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K30	1:30 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r* (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
24088CAME4	440	17.3228	650	25.5906	212	8.3465	0.196	18.43	19.07	22.67	24.49
24092CAME4	460	18.1102	680	26.7717	218	8.5827	0.196	19.21	20.01	23.75	25.67
24096CAME4	480	18.8976	700	27.5591	218	8.5827	0.196	20.00	20.71	24.59	26.46
240/500CAME4	500	19.6850	720	28.3465	218	8.5827	0.196	20.79	21.42	25.3	27.24
240/530CAME4	530	20.8661	780	30.7087	250	9.8425	0.196	21.97	22.83	27.17	29.61
240/560CAME4	560	22.0472	820	32.2835	258	10.1575	0.196	23.15	24.18	28.71	31.18
240/600CAME4	600	23.6220	870	34.2520	272	10.7087	0.196	24.72	25.72	30.38	33.15
240/630CAME4	630	24.8031	920	36.2205	290	11.4173	0.236	26.22	27.19	32.08	34.80
240/670CAME4	670	26.3780	980	38.5827	308	12.1260	0.236	27.80	28.8	34.15	37.17
240/710CAME4	710	27.9528	1030	40.5512	315	12.4016	0.236	29.37	30.5	36.06	39.13
240/800CAME4	800	31.4961	1150	45.2756	345	13.5827	0.236	32.91	34.45	40.5	43.86
240/850CAME4	850	33.4646	1220	48.0315	365	14.3701	0.236	34.88	36.64	43.03	46.61
240/950CAME4	950	37.4016	1360	53.5433	412	16.2205	0.236	38.82	40.85	47.97	52.13
240/1000CAME4	1000	39.3701	1420	55.9055	412	16.2205	0.236	40.79	42.84	50.19	54.49
240/1120CAME4	1120	44.0945	1580	62.2047	462	18.1890	0.314	45.83	48.14	55.92	60.47
240/1250CAME4	1250	49.2126	1750	68.8976	500	19.6850	0.314	50.94	54.35	62.15	67.17
240/1320CAME4	1320	51.9685	1850	72.8346	530	20.8661	0.393	54.09	57.16	65.17	70.71
240/1400CAME4	1400	55.1181	1950	76.7717	545	21.4567	0.393	57.24	59.77	69.57	74.65

*Maximum fillet which corner radius of bearing will clear.

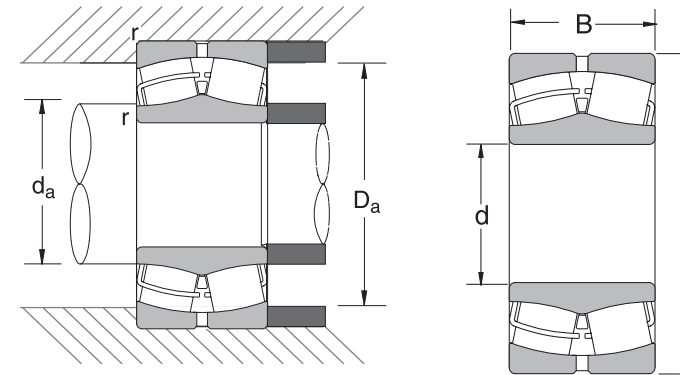
Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
	24088CAME4	940000	2050000	360	450
24092CAME4	1010000	2240000	340	430	579.7
24096CAME4	1040000	2290000	320	430	590.0
240/500CAME4	995000	2220000	300	400	607.6
240/530CAME4	1210000	2660000	280	360	857.2
240/560CAME4	1340000	3000000	260	340	969.1
240/600CAME4	1480000	3400000	240	320	1164.0
240/630CAME4	1700000	4000000	220	300	1400.0
240/670CAME4	1900000	4400000	200	260	1701.0
240/710CAME4	1990000	4650000	190	240	1894.0
240/800CAME4	2440000	5900000	160	200	2480.0
240/850CAME4	2610000	6350000	150	190	2965.0
240/950CAME4	3250000	8150000	120	160	4146.0
240/1000CAME4	3450000	8700000	110	150	4421.0
240/1120CAME4	4200000	11100000	95	120	6143.0
240/1250CAME4	4700000	13400000	75	100	8136.0
240/1320CAME4	5100000	14300000	67	85	9673.0
240/1400CAME4	5500000	14600000	60	75	10772.0

C_r = Dynamic Radial Load Rating

C_{0r} = Static Radial Load Rating

Spherical Roller Bearings: 24100 Series

Bore Diameter 100 - 320 mm, 3.9370 - 12.5984 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K30	1:30 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r** (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
24120CAME4	100	3.9370	165	6.4961	65	2.5591	0.078	4.33	4.50	5.62	6.10
24122CE4*	110	4.3307	180	7.0866	69	2.7165	0.078	4.72	4.86	6.04	6.69
24122CAME4*	110	4.3307	180	7.0866	69	2.7165	0.078	4.72	4.87	6.04	6.69
24124CE4*	120	4.7244	200	7.8740	80	3.1496	0.078	5.12	5.36	6.72	7.48
24124CAME4*	120	4.7244	200	7.8740	80	3.1496	0.078	5.12	5.36	6.72	7.48
24126CE4*	130	5.1181	210	8.2677	80	3.1496	0.078	5.51	5.77	7.09	7.87
24126CAME4*	130	5.1181	210	8.2677	80	3.1496	0.078	5.51	5.75	7.09	7.87
24128CE4*	140	5.5118	225	8.8583	85	3.3465	0.078	5.98	6.15	7.57	8.39
24128CAME4*	140	5.5118	225	8.8583	85	3.3465	0.078	5.98	6.12	7.53	8.39
24130CE4*	150	5.9055	250	9.8425	100	3.9370	0.078	6.38	6.65	8.33	9.37
24130CAME4*	150	5.9055	250	9.8425	100	3.9370	0.078	6.38	6.68	8.33	9.37
24132CE4*	160	6.2992	270	10.6299	109	4.2913	0.078	6.77	7.07	8.99	10.16
24132CAME4*	160	6.2992	270	10.6299	109	4.2913	0.078	6.77	7.14	8.99	10.16
24134CE4*	170	6.6929	280	11.0236	109	4.2913	0.078	7.17	7.49	9.39	10.55
24134CAME4*	170	6.6929	280	11.0236	109	4.2913	0.078	7.17	7.54	9.39	10.55
24136CE4*	180	7.0866	300	11.8110	118	4.6457	0.098	7.64	7.98	10.04	11.26
24136CAME4*	180	7.0866	300	11.8110	118	4.6457	0.098	7.64	7.99	10.04	11.26
24138CE4*	190	7.4803	320	12.5984	128	5.0394	0.098	8.03	8.31	10.58	12.05
24138CAME4*	190	7.4803	320	12.5984	128	5.0394	0.098	8.03	8.41	10.57	12.05
24140CE4*	200	7.8740	340	13.3858	140	5.5118	0.098	8.43	8.90	11.39	12.83
24140CAME4*	200	7.8740	340	13.3858	140	5.5118	0.098	8.43	8.92	11.39	12.83
24144CE4*	220	8.6614	370	14.5669	150	5.9055	0.118	9.37	9.78	12.30	13.86
24144CAME4*	220	8.6614	370	14.5669	150	5.9055	0.118	9.37	9.82	12.30	13.86
24148CE4*	240	9.4488	400	15.7480	160	6.2992	0.118	10.16	10.55	13.42	15.04
24148CAME4*	240	9.4488	400	15.7480	160	6.2992	0.118	10.16	10.59	13.42	15.04
24152CE4	260	10.2362	440	17.3228	180	7.0866	0.118	10.94	11.60	14.60	16.61
24152CAME4	260	10.2362	440	17.3228	180	7.0866	0.118	10.94	11.65	14.60	16.61
24156CXE4	280	11.0236	460	18.1102	180	7.0866	0.157	11.89	12.39	15.42	17.24
24156CAME4	280	11.0236	460	18.1102	180	7.0866	0.157	11.89	12.43	15.42	17.24
24160CXE4	300	11.8110	500	19.6850	200	7.8740	0.157	12.68	13.27	16.62	18.82
24160CAME4	300	11.8110	500	19.6850	200	7.8740	0.157	12.68	13.33	16.62	18.82
24164CE4	320	12.5984	540	21.2598	218	8.5827	0.157	13.46	14.25	17.95	20.39
24164CAME4	320	12.5984	540	21.2598	218	8.5827	0.157	13.46	14.32	17.95	20.39

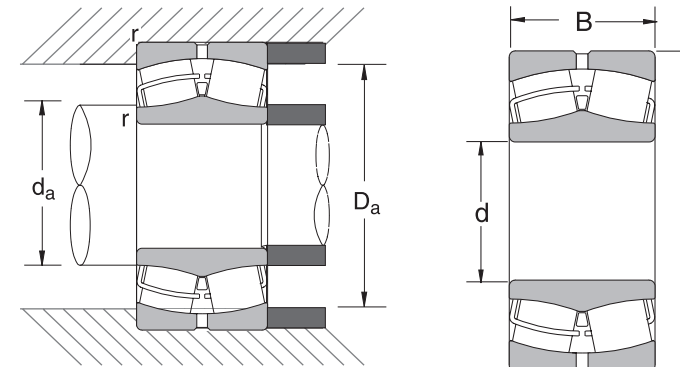
*Indicates NSK (HPS) High Performance Standard bearing. **Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
	24120CAME4	77500	121000	1700	2200
24122CE4*	129265	168000	1600	2000	14.90
24122CAME4*	129265	168000	1600	2000	14.40
24124CE4*	156242	213000	1400	1800	21.90
24124CAME4*	156242	203000	1400	1800	20.80
24126CE4*	165235	228000	1300	1700	23.30
24126CAME4*	165235	227000	1300	1700	22.10
24128CE4*	187715	261000	1200	1600	28.30
24128CAME4*	187715	260000	1200	1600	27.00
24130CE4*	240546	345000	1100	1400	43.20
24130CAME4*	240546	325000	1100	1400	41.10
24132CE4*	278763	395000	1000	1300	55.40
24132CAME4*	278763	375000	1000	1300	53.50
24134CE4*	287755	420000	1000	1300	58.00
24134CAME4*	287755	400000	1000	1300	55.70
24136CE4*	334965	460000	900	1200	72.30
24136CAME4*	334965	460000	900	1200	70.80
24138CE4*	366439	525000	850	1100	90.30
24138CAME4*	366439	505000	850	1100	88.10
24140CE4*	440625	600000	800	1000	111.90
24140CAME4*	440625	600000	800	1000	109.20
24144CE4*	505820	720000	710	950	146.70
24144CAME4*	505820	720000	710	950	137.70
24148CE4*	597992	850000	670	850	173.70
24148CAME4*	597992	850000	670	850	172.20
24152CE4	664715	1050000	600	800	242.00
24152CAME4	664715	1050000	600	800	237.40
24156CXE4	685487	1010000	560	750	251.70
24156CAME4	685487	1120000	560	750	250.50
24160CXE4	804928	1240000	500	670	339.80
24160CAME4	804928	1310000	500	670	332.70
24164CE4	921773	1490000	480	600	440.00
24164CAME4	921773	1490000	480	600	427.20

C_r = Dynamic Radial Load Rating C_{0r} = Static Radial Load Rating
*Indicates NSK (HPS) High Performance Standard bearing.

Spherical Roller Bearings: 24100 Series (cont.)

Bore Diameter 340 - 670 mm, 13.3858 - 26.3780 inch



COMMON OPTIONS

TL	Tough & Long Life
HTF	High Tough
STF	Super Tough
CAM	One Piece Brass Cage
C,CD	Two Piece Steel Cage
EA	High Capacity Steel Cage
H	Two Piece Polyamide Cage
K30	1:30 Tapered Bore
G3	Inner Ring Carburized
E4	Lube Groove/Holes, Outer Ring
CO*	Normal Internal Clearance
C2	Tight Internal Clearance
C3	Greater than Normal Internal Clearance
P55	High Running Accuracy Both Rings
S11	Heat Stabilized to 200°C
VE	Vibrating Equipment

*Not shown in part number
See page D-1 for additional options.

Bearing Number	Nominal Bearing Dimensions						Preferred Shoulder Diameters				
	d		D		B		r* (in)	da (in)		Da (in)	
	mm	inch	mm	inch	mm	inch	max	min	max	min	max
24168CXE4	340	13.3858	580	22.8346	243	9.5669	0.157	14.25	15.12	19.23	21.97
24168CAME4	340	13.3858	580	22.8346	243	9.5669	0.157	14.25	15.19	19.23	21.97
24172CAME4	360	14.1732	600	23.6220	243	9.5669	0.157	15.04	15.95	19.95	22.76
24176CXE4	380	14.9606	620	24.4094	243	9.5669	0.157	15.83	16.69	20.72	23.54
24176CAME4	380	14.9606	620	24.4094	243	9.5669	0.157	15.83	16.77	20.80	23.54
24180CAME4	400	15.7480	650	25.5906	250	9.8425	0.196	16.85	17.65	21.69	24.49
24184CAME4	420	16.5354	700	27.5591	280	11.0236	0.196	17.64	18.84	23.51	26.46
24188CAME4	440	17.3228	720	28.3465	280	11.0236	0.196	18.43	19.64	24.27	27.24
24192CAME4	460	18.1102	760	29.9213	300	11.8110	0.236	19.53	20.40	25.43	28.50
24196CAME4	480	18.8976	790	31.1024	308	12.1260	0.236	20.31	21.25	26.38	29.69
241/500CAME4	500	19.6850	830	32.6772	325	12.7953	0.236	21.10	22.02	27.68	31.26
241/560CAME4	560	22.0472	920	36.2205	355	13.9764	0.236	23.46	24.79	30.76	34.80
241/600CAME4	600	23.6220	980	38.5827	375	14.7638	0.236	25.04	26.53	32.88	37.17
241/630CAME4	630	24.8031	1030	40.5512	400	15.7480	0.236	26.22	27.80	34.47	39.13
241/670CAME4	670	26.3780	1090	42.9134	412	16.2205	0.236	27.80	29.72	36.74	41.50

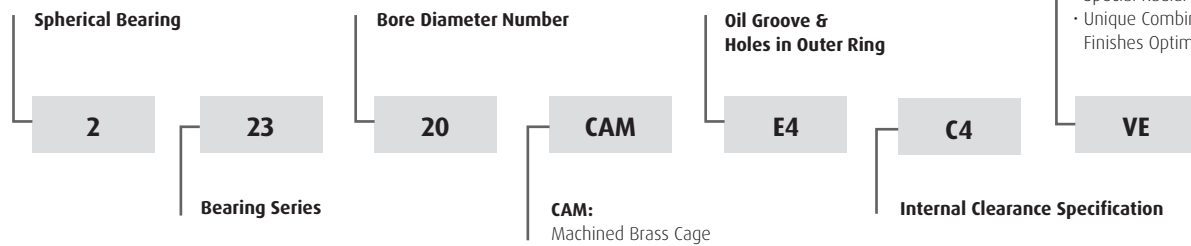
*Maximum fillet which corner radius of bearing will clear.

Bearing Number	Basic Load Ratings (lbs)		Limiting Speeds (RPM)		Bearing Weight Approx. lbs
	C _r	C _{0r}	Grease	Oil	
	24168CXE4	915000	1690000	430	560
24168CAME4	955000	1780000	430	560	560.2
24172CAME4	945000	1800000	400	530	576.0
24176CXE4	945000	1820000	400	500	612.9
24176CAME4	975000	1900000	400	500	600.5
24180CAME4	1285289	2260000	380	480	691.5
24184CAME4	1350000	2690000	340	450	919.5
24188CAME4	1340000	2710000	320	430	947.5
24192CAME4	1635822	2800000	300	400	1121.0
24196CAME4	1610000	3300000	300	380	1248.0
241/500CAME4	1800000	3600000	280	360	1465.0
241/560CAME4	2120000	4400000	240	320	1948.0
241/600CAME4	2340000	4900000	220	280	2310.0
241/630CAME4	2460000	5150000	200	260	2739.0
241/670CAME4	2790000	5950000	190	240	3175.0

C_r = Dynamic Radial Load Rating

C_{0r} = Static Radial Load Rating

Shaker Screen Bearings



Please refer to the bearing tables for exact part number options.

Radial Internal Clearance (inches)

Bearing Bore (mm)	Unmounted				Mounted			
	C3		C4		C3		C4	
	min	max	min	max	min	max	min	max
40	0.0020	0.0024	0.0026	0.0031	0.0006	0.0019	0.0012	0.0026
45-50	0.0024	0.0031	0.0033	0.0039	0.0010	0.0026	0.0019	0.0034
55	0.0029	0.0035	0.0039	0.0047	0.0015	0.0030	0.0025	0.0042
60-65	0.0029	0.0035	0.0039	0.0047	0.0012	0.0038	0.0022	0.0040
70	0.0035	0.0043	0.0047	0.0057	0.0018	0.0036	0.0030	0.0050
75-80	0.0035	0.0043	0.0047	0.0057	0.0018	0.0038	0.0030	0.0052
85	0.0043	0.0053	0.0059	0.0071	0.0026	0.0048	0.0042	0.0066
90-100	0.0043	0.0053	0.0059	0.0071	0.0025	0.0048	0.0041	0.0066
110	0.0053	0.0063	0.0070	0.0083	0.0036	0.0058	0.0052	0.0078
120	0.0053	0.0063	0.0070	0.0083	0.0032	0.0055	0.0049	0.0075
130-140	0.0063	0.0075	0.0081	0.0094	0.0042	0.0067	0.0060	0.0086
150-160	0.0075	0.0087	0.0094	0.0110	0.0053	0.0080	0.0072	0.0103
170-180	0.0079	0.0094	0.0104	0.0122	0.0057	0.0087	0.0082	0.0115
190	0.0087	0.0102	0.0113	0.0134	0.0065	0.0095	0.0091	0.0127
200	0.0087	0.0102	0.0113	0.0134	0.0063	0.0094	0.0089	0.0126

Interchange

NSK	TORR/TIMKEN	SKF	FAG*
22308CAME4C4VE	22308YMW33W800C4	452308CM2/W502	22308SMAC4F80
22309CAME4C4VE	22309YMW33W800C4	452309CM2/W502	22309SMAC4F80
22310CAME4C4VE	22310YMW33W800C4	452310CM2/W502	22310SMAC4F80
22311CAME4C4VE	22311YMW33W800C4	452311CM2/W502	22311SMAC4F80
22312CAME4C4VE	22312YMW33W800C4	452312CM2/W502	22312SMAC4F80
22313CAME4C4VE	22313YMW33W800C4	452313CM2/W502	22313SMAC4F80
22314CAME4C4VE	22314YMW33W800C4	452314CM2/W502	22314SMAC4F80
22315CAME4C4VE	22315YMW33W800C4	452315CM2/W502	22315SMAC4F80
22316CAME4C4VE	22316YMW33W800C4	452316CM2/W502	22316SMAC4F80
22317CAME4C4VE	22317YMW33W800C4	452317CM2/W502	22317SMAC4F80
22318CAME4C4VE	22318YMW33W800C4	452318CM2/W502	22318SMAC4F80
22319CAME4C4VE	22319YMW33W800C4	452319CM2/W502	22319SMAC4F80
22320CAME4C4VE	22320YMW33W800C4	452320CM2/W502	22320SMAC4F80
22322CAME4C4VE	22322YMW33W800C4	452322CM2/W502	22322SMAC4F80
22324CAME4C4VE	22324YMW33W800C4	452324CM2/W502	22324SMAC4F80
22326CAME4C4VE	22326YMW33W800C4	452326CM2/W502	22326SMAC4F80
22328CAME4C4VE	22328YMW33W800C4	452328CM2/W502	22328SMAC4F80
22330CAME4C4VE	22330YMW33W800C4	452330CM2/W502	22330AMAC4F80
22332CAME4C4VE	22332YMW33W800C4	452332CM2/W502	22332AMAC4F80
22334CAME4C4VE	22334W33W800C4	452334CM2/W502	22334AMAC4F80
22336CAME4C4VE	22336W33W800C4	452336CM2/W502	22336AMAC4F80
22338CAME4C4VE	22338W33W800C4	452338CM2/W502	22338AMAC4F80
22340CAME4C4VE	22340W33W800C4	452340CM2/W502	22340AMAC4F80
23322CAME4C4VE	23322W33W800C4	453322CM2/W502	23322SMAC4F80
23324CAME4C4VE	23324W33W800C4	453324CM2/W502	23324SMAC4F80
23326CAME4C4VE	23326W33W800C4	453326CM2/W502	23326SMAC4F80
23328CAME4C4VE	23328W33W800C4	453328CM2/W502	23328SMAC4F80
23330CAME4C4VE	23330W33W800C4	453330CM2/W502	23330SMAC4F80
23332CAME4C4VE	23332W33W800C4	453332CM2/W502	23332SMAC4F80
23338CAME4C4VE	23338W33W22BRC4	453338CM2/W502	23338SMAC4F80
23340CAME4C4VE	23340W33W22BRC4	-	23340SMAC4F80

* NSK bearings with "CAME4C4VE" suffix may also be used in place of bearings with FAG suffix "T41A", "T41B", "T41".

The competitive manufacturers are provided for a convenient source of unit substitution. They can be considered interchangeable in most instances, but for special applications, please consult NSK Engineering. NSK assumes no liability with respect to errors or omissions.

Shaker Screen Bearings: 22300/23300 Series

Shaker Screen Bearings: 22300/23300 Series

Fitting Recommendations

223 Series

Bearing Number	Bearing Dimensions						CAM Design			
	Bore		O.D.		Width		Capacity		Limiting Speeds (RPM)	
	mm	inch	mm	inch	mm	inch	Cr (lbf)	Cr (N)	Grease	Oil
22308	40	1.5748	90	3.5433	33	1.2992	34000	152000	4300	5300
22309	45	1.7717	100	3.9370	36	1.4173	41000	185000	3800	4800
22310	50	1.9685	110	4.3307	40	1.5748	52000	232000	3600	4300
22311	55	2.1654	120	4.7244	43	1.6929	58000	261000	3200	4000
22312	60	2.3622	130	5.1181	46	1.8110	68000	305000	3000	3600
22313	65	2.5591	140	5.5118	48	1.8898	73000	330000	2800	3400
22314	70	2.7559	150	5.9055	51	2.0079	84000	380000	2600	3200
22315	75	2.9528	160	6.2992	55	2.1654	94000	425000	2400	3000
22316	80	3.1496	170	6.6929	58	2.2835	108000	485000	2200	2800
22317	85	3.3465	180	7.0866	60	2.3622	116000	520000	2000	2600
22318	90	3.5433	190	7.4803	64	2.5197	134000	605000	2000	2400
22319	95	3.7402	200	7.8740	67	2.6378	146000	655000	1900	2400
22320	100	3.9370	215	8.4646	73	2.8740	167000	750000	1700	2200
22322	110	4.3307	240	9.4488	80	3.1496	206000	925000	1600	1900
22324	120	4.7244	260	10.2362	86	3.3858	236000	1060000	1400	1800
22326	130	5.1181	280	11.0236	93	3.6614	276000	1240000	1300	1600
22328	140	5.5118	300	11.8110	102	4.0157	322000	1450000	1200	1500
22330	150	5.9055	320	12.5984	108	4.2520	340000	1530000	1100	1400
22332	160	6.2992	340	13.3858	114	4.4882	378000	1700000	1100	1300
22334	170	6.6929	360	14.1732	120	4.7244	438000	1970000	1000	1200
22336	180	7.0866	380	14.9606	126	4.9606	482000	2170000	950	1200
22338	190	7.4803	400	15.7480	132	5.1969	527000	2370000	900	1100

233 Series

23322	110	4.3307	240	9.4488	92	3.6220	173000	780000	1700	2200
23324	120	4.7244	260	10.2362	106	4.1732	213000	960000	1500	1900
23326	130	5.1181	280	11.0236	112	4.4094	231000	1040000	1400	1800
23328	140	5.5118	300	11.8110	118	4.6457	276000	1240000	1300	1700
23330	150	5.9055	320	12.5984	128	5.0394	311000	1400000	1200	1500
23332	160	6.2992	340	13.3858	136	5.3543	344000	1550000	1100	1400
23338	190	7.4803	400	15.7480	155	6.1024	462000	2080000	950	1200
23340	200	7.8740	420	16.5354	165	6.4961	520000	2340000	900	1100
23344	220	8.6614	460	18.1102	180	7.0866	622000	2800000	800	1000

223 Series

Bearing Number	Shaft Diameter (in)			Housing Bore Diameter (in)		
	max	min	fit	min	max	fit
	22308	1.5741	1.5738	.0003L-.0010L	3.5416	3.5422
22309	1.7710	1.7707	.0003L-.0010L	3.9353	3.9359	.0006T-.0015T
22310	1.9678	1.9675	.0003L-.0010L	4.3290	4.3296	.0006T-.0015T
22311	2.1650	2.1643	.0004L-.0011L	4.7227	4.7233	.0006T-.0015T
22312	2.3614	2.3611	.0004L-.0011L	5.1161	5.1168	.0008T-.0018T
22313	2.5583	2.5580	.0004L-.0011L	5.5098	5.5105	.0008T-.0018T
22314	2.7551	2.7548	.0004L-.0011L	5.9035	5.9042	.0008T-.0018T
22315	2.9520	2.9517	.0004L-.0011L	6.2966	6.2971	.0014T-.0024T
22316	3.1488	3.1485	.0004L-.0011L	6.6903	6.6908	.0014T-.0024T
22317	3.3446	3.3442	.0014L-.0023L	7.0840	7.0845	.0014T-.0024T
22318	3.5414	3.5410	.0014L-.0023L	7.4772	7.4778	.0016T-.0028T
22319	3.7383	3.7379	.0014L-.0023L	7.8709	7.8715	.0016T-.0028T
22320	3.9351	3.9347	.0014L-.0023L	8.4614	8.4620	.0016T-.0028T
22322	4.3288	4.3284	.0014L-.0023L	9.4457	9.4463	.0016T-.0028T
22324	4.7225	4.7221	.0014L-.0023L	10.2327	10.2335	.0018T-.0031T
22326	5.1158	5.1154	.0017L-.0027L	11.0201	11.0209	.0018T-.0031T
22328	5.5095	5.5091	.0017L-.0027L	11.8075	11.8083	.0018T-.0031T
22330	5.9032	5.9028	.0017L-.0027L	12.5945	12.5953	.0020T-.0034T
22332	6.2969	6.2965	.0017L-.0027L	13.3819	13.3827	.0020T-.0034T
22334	6.6906	6.6902	.0017L-.0027L	14.1693	14.1701	.0020T-.0034T
22336	7.0843	7.0839	.0017L-.0027L	14.9567	14.9575	.0020T-.0034T
22338	7.4776	7.4772	.0020L-.0031L	15.7441	15.7449	.0020T-.0034T

233 Series

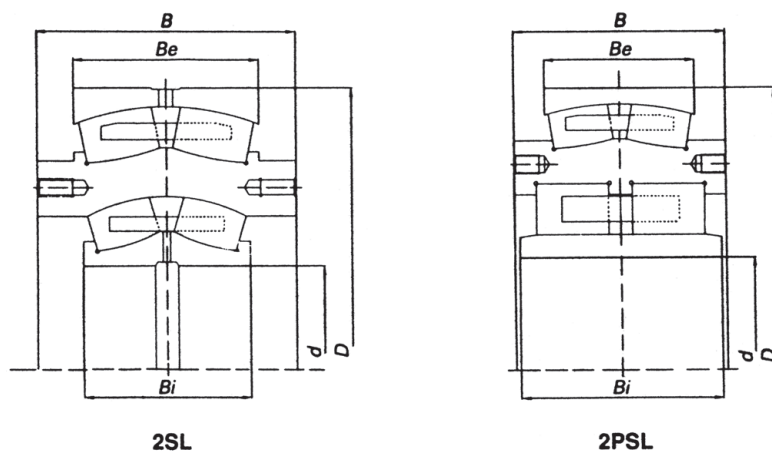
23322	4.3288	4.3284	.0014L-.0023L	9.4457	9.4463	.0016T-.0028T
23324	4.7225	4.7221	.0014L-.0023L	10.2327	10.2335	.0018T-.0031T
23326	5.1158	5.1154	.0017L-.0027L	11.0201	11.0209	.0018T-.0031T
23328	5.5095	5.5091	.0017L-.0027L	11.8075	11.8083	.0018T-.0031T
23330	5.9032	5.9028	.0017L-.0027L	12.5945	12.5953	.0020T-.0034T
23332	6.2969	6.2965	.0017L-.0027L	13.3819	13.3827	.0020T-.0034T
23338	6.6906	6.6902	.0017L-.0027L	14.1693	14.1701	.0020T-.0034T
23340	7.0843	7.0839	.0017L-.0027L	14.9567	14.9575	.0020T-.0034T
23344	7.4776	7.4772	.0020L-.0031L	15.7441	15.7449	.0020T-.0034T

Triple Ring Bearings

Interchange

NSK	SKF	FAG	TORR/TIMKEN
2SL180-2UPA	462825	525349	B9483G
2SL200-2UPA	462826	531033	B9484G
2SL220-2UPA	462827	527870	B9485G
2SL240-2UPA	462828	531040	B9486G
2SL260-2UPA	462606	522933	B9362G (B7362G)
2SL280-2UPA	462829	525350	B9417G
2SL300-2UPA	461619	522401	B9193G (B7193G)
2SL320-2UPA	461902	525351	B9194G
2SL340-2UPA	460924	522400	B9094G (B7094G)

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Bearing Number	Boundary Dimensions					Mass	
	d	D	B _i	B _e	B	kg	lbs
2SL180-2UPA	180	480	140	160	215.9	165	364
2SL200-2UPA	200	520	160	180	241.3	230	507
2SL220-2UPA	220	600	180	200	279.4	330	728
2SL240-2UPA	240	620	200	200	279.4	410	904
2PSL240-1UPA	240	600	205	160	225.0	285	628
2SL260-2UPA	260	680	218	218	317.5	490	1080
2SL280-2UPA	280	720	218	218	317.5	525	1157
2SL300-2UPA	300	780	243	250	342.9	735	1620
2SL320-2UPA	320	820	258	258	368.3	840	1851
2SL340-2UPA	340	870	280	272	393.7	1050	2314



Notes
