CATALOG 2009

TENGEN BEARING COMPANY

TAPERED ROLLER BEARINGS

Catalog No. TP1200

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FOREWORD

We would like to thank you for your interest of our catalog 2009, after months of researches and preparations, we are proud to publish this catalog for all our valued customers. We promise we have contributed our best efforts ensuring the correctness, accuracy and completeness of information made available in this catalog. We sincerely hope this publish will help to fill your needs.

The main objective of this catalog is to act as a bearing handbook for bearings substitution from one brand to a product of China. We assure that bearings which are listed in this catalog are within the competitive edge of China market, which means that they are technically established, available in stocks or within the shortest possible delivery lead-time, and lowest requirement of minimum order. Bearing numbers that are not listed in this book might probably available too, please contact us for further information if your bearing numbers are not listed.

The reason why we design this catalog in a way of bearings interchangeability, having few main internationally renowned brands lined up for comparison, is intending to save our customers' hassles when they are looking for bearings substitutions in China. More brands of bearings' numbers will be added for comparison in future version of this catalog. We believe with information published in this book, in cooperation with our professional product consultation, we certainly are the Ease of Buying Solution for you to source from China.

Note:
Relevant information of bearings such as Basic Load Ratings, Speed Ratings, Factor, Bearings Weight and etc… published here are extracted from one manufacturers' catalog, these statistics may not be applicable for all brands of bearings, please use these information for reference purpose only.

ABOUT THE COMPANY

TENGEN Bearing Company is established by a group of people who possess vast experiences, professional knowledge of bearings, and bearings' industrial applications. Most of our managers and engineers have been in the bearings market for over 10 years and now closely tightened up with the Chinese market and being constantly updated about the local market information. This has consequently granted us the exclusive access to the rich market resources from around the China regions, and that enabling us the great advantages in aspect of both cost and quality of products.

Locally in China, we are not only dealing with Chinese bearings. We are also a reseller of most internationally renowned brands of bearings such as SKF, FAG, NSK, TIMKEN and etc… This provides us the capability and greater technical knowledge of bearings exchangeability in China market.

OUR MISSION

"We aim to be one of the most preferred Chinese bearings suppliers to all our customers and potential customers worldwide"

FREQUENTLY APPLIED TECHNICAL DATA OF BEARINGS

Bearings Tolerance Class
Bearings Tolerance Symbols
Tolerance Tables
Bearings Series Symbols
Bearings Supplementary Designations

BEARINGS TOLERANCES CLASSES

Types of Bearings		Tolerance Classes				
Deep Groove Ball Bearings		Normal	Class 6	Class 5	Class 4	Class 2
Angular Contact Ball Bearings		Normal	Class 6	Class 5	Class 4	Class 2
Self-aligning Ball Bearings		Normal	Class 6 equivalent	Class 5 equivalent	–	–
Cylindrical Roller Bearings		Normal	Class 6	Class 5	Class 4	Class 2
Solid Type Needle Roller Bearings		Normal	Class 6	Class 5	Class 4	–
Spherical Roller Bearings		Normal	Class 6 equivalent	Class 5 equivalent	–	–
Thrust Ball Bearings		Normal	Class 6	Class 5	Class 4	–
Spherical Thrust Roller Bearings		Normal	–	–	–	–
Metric-design Tapered Roller Bearings		Normal Class 6X	–	Class 5	Class 4	–
Inch-design Tapered Roller Bearings		ABMA CLASS 4	ABMA CLASS 2	ABMA CLASS 3	ABMA CLASS 0	ABMA CLASS 00
Equivalent standards						
GB/T 307.1 Chinese National Standard		Class 0	Class 6	Class 5	Class 4	Class 2
JIS B1514 Japanese Industrial Standard		Class 0	Class 6	Class 5	Class 4	Class 2
DIN 620 (Deutsches Institut für Normung) German Institute for Standardization		P0	P6	P5	P4	P2
ABMA American Bearing Manufacturers Association	Ball Bearings	ABEC 1	ABEC 3	ABEC 5 (CLASS 5P)	ABEC 7 (CLASS 7P)	ABEC 9 (CLASS 9P)
	Roller Bearings	RBEC 1	RBEC 3	RBEC 5	–	–
	Tapered Roller Bearings	CLASS 4	CLASS 2	CLASS 3	CLASS 0	CLASS 00

Note
1. The most common bearings produced in China are basically Normal Class, in accordance to JIS standard at class zero. (please refer to ISO 492/199/582/ABEC1/GB/T307.1 P0 for detailed requirements of bearings tolerance) You may also obtain detailed bearings tolerance statistics from manufacturers' catalog.
2. Bearings may be produced at Class 6 upon requested by customers for relatively rigid applications. Please contact our sales personnel for detailed information before placing an order.

BEARING TOLERANCES

Symbols of Boundary Dimension and Running Accuracy

d	*Nominal bearing bore diameter*
Δ_{ds}	*Deviation of single bore diameter*
Δ_{dmp}	*Deviation of mean bore diameter in a single plane*
V_{dp}	*Variation of mean bore diameter in a single plane*
V_{dmp}	*Variation of mean bore diameter*
B	*Nominal inner ring width*
Δ_{Bs}	*Deviation of single ring width*
V_{Bs}	*Variation of single ring width*
K_{ia}	*Radial runout of inner ring of assembled bearing*
S_d	*Runout of inner ring face to the bore*
S_{ia}	*Axial runout of end face to inner ring raceway of assembled bearing*
S_i / S_e	*Variation of washer thickness of (shaft / housing) locating washers*
T	*Nominal bearing height of a single direction axial bearing*
D	*Nominal bearing outer diameter*
Δ_{Ds}	*Deviation of single outer diameter*
Δ_{Dmp}	*Deviation of mean outer diameter in a single plane*
V_{Dp}	*Variation of single outer diameter in a single plane*
V_{Dmp}	*Variation of mean outer diameter*
C	*Nominal outer ring width*
Δ_{Cs}	*Deviation of single outer ring width*
V_{Cs}	*Variation of outer ring width*
K_{ea}	*Radial runout of outer ring of assembled bearing*
S_D	*Runout of outer ring outside surface generatrix to the face*
S_{ea}	*Axial runout of end face to outer ring raceway of assembled bearing*

Tolerance Tables (Part 1)

d (mm)		Δ_{dmp} Deviation of Mean Bore Diameter										units : μm
		Normal		Class 6		Class 5		Class 4		Class 2		
Over	Incl.	High	Low	High	Low	High	Low	High	Low	High	Low	
0.6	2.5	0	-8	0	-7	0	-5	0	-4	0	-2.5	
2.5	10	0	-8	0	-7	0	-5	0	-4	0	-2.5	
10	18	0	-8	0	-7	0	-5	0	-4	0	-2.5	
18	30	0	-10	0	-8	0	-6	0	-5	0	-2.5	
30	50	0	-12	0	-10	0	-8	0	-6	0	-2.5	
50	80	0	-15	0	-12	0	-9	0	-7	0	-4	
80	120	0	-20	0	-15	0	-10	0	-8	0	-5	
120	150	0	-25	0	-18	0	-13	0	-10	0	-7	
150	180	0	-25	0	-18	0	-13	0	-10	0	-7	
180	250	0	-30	0	-22	0	-15	0	-12	0	-8	
250	315	0	-35	0	-25	0	-18	-	-	-	-	
315	400	0	-40	0	-30	0	-23	-	-	-	-	
400	500	0	-45	0	-35	-	-	-	-	-	-	
500	630	0	-50	0	-40	-	-	-	-	-	-	
630	800	0	-75	-	-	-	-	-	-	-	-	
800	1,000	0	-100	-	-	-	-	-	-	-	-	
1,000	1,250	0	-125	-	-	-	-	-	-	-	-	
1,250	1,600	0	-160	-	-	-	-	-	-	-	-	
1,600	2,000	0	-200	-	-	-	-	-	-	-	-	

d (mm)		V_{dmp} Variation of Mean Bore Diameter					Δ_{Bs} (or Δ_{Cs}) Deviation of Single (Outer) Ring Width											units : μm
							Single Bearing						Combined Bearings					
		Normal	Class 6	Class 5	Class 4	Class 2	Normal Class 6		Class 5 Class 4		Class 2		Normal Class 6		Class 5 Class 4		Class 2	
Over	Incl.	Max	Max	Max	Max	Max	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
0.6	2.5	6	5	3	2	1.5	0	-40	0	-40	0	-40	-	-	0	-250	0	-250
2.5	10	6	5	3	2	1.5	0	-120	0	-40	0	-40	0	-250	0	-250	0	-250
10	18	6	5	3	2	1.5	0	-120	0	-80	0	-80	0	-250	0	-250	0	-250
18	30	8	6	3	2.5	1.5	0	-120	0	-120	0	-120	0	-250	0	-250	0	-250
30	50	9	8	4	3	1.5	0	-120	0	-120	0	-120	0	-250	0	-250	0	-250
50	80	11	9	5	3.5	2	0	-150	0	-150	0	-150	0	-380	0	-250	0	-250
80	120	15	11	5	4	2.5	0	-200	0	-200	0	-380	0	-380	0	-380	0	-380
120	150	19	14	7	5	3.5	0	-250	0	-250	0	-250	0	-500	0	-380	0	-380
150	180	19	14	7	5	3.5	0	-250	0	-250	0	-250	0	-500	0	-380	0	-380
180	250	23	17	8	6	4	0	-300	0	-300	0	-300	0	-500	0	-500	0	-500
250	315	26	19	9	-	-	0	-350	0	-350	-	-	0	-500	0	-500	-	-
315	400	30	23	12	-	-	0	-400	0	-400	-	-	0	-630	0	-630	-	-
400	500	34	26	-	-	-	0	-450	-	-	-	-	-	-	-	-	-	-
500	630	38	30	-	-	-	0	-500	-	-	-	-	-	-	-	-	-	-
630	800	-	-	-	-	-	0	-750	-	-	-	-	-	-	-	-	-	-
800	1,000	-	-	-	-	-	0	-1 000	-	-	-	-	-	-	-	-	-	-
1,000	1,250	-	-	-	-	-	0	-1,250	-	-	-	-	-	-	-	-	-	-
1,250	1,600	-	-	-	-	-	0	-1,600	-	-	-	-	-	-	-	-	-	-
1,600	2,000	-	-	-	-	-	0	-2,000	-	-	-	-	-	-	-	-	-	-

Tolerance Tables (Part 2)

units : μm		K_{ia} Radial runout of inner ring of assembled bearing					S_d Runout of inner ring face to the bore			S_{ia} Axial runout of end face to inner ring raceway of assembled bearing		
d (mm)		Class 0	Class 6	Class 5	Class 4	Class 2	Class 5	Class 4	Class 2	Class 5	Class 4	Class 2
Over	Incl	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
0.6	2.5	10	5	4	2.5	1.5	7	3	1.5	7	3	1.5
2.5	10	10	6	4	2.5	1.5	7	3	1.5	7	3	1.5
10	18	10	7	4	2.5	1.5	7	3	1.5	7	3	1.5
18	30	13	8	4	3	2.5	8	4	1.5	8	4	2.5
30	50	15	10	5	4	2.5	8	4	1.5	8	4	2.5
50	80	20	10	5	4	2.5	8	5	1.5	8	5	2.5
80	120	25	13	6	5	2.5	9	5	2.5	9	5	2.5
120	150	30	18	8	6	2.5	10	6	2.5	10	7	2.5
150	180	30	18	8	6	5	10	6	4	10	7	5
180	250	40	20	10	8	5	11	7	5	13	8	5
250	315	50	25	13	-	-	13	-	-	15	-	-
315	400	60	30	15	-	-	15	-	-	20	-	-
400	500	65	35	-	-	-	-	-	-	-	-	-
500	630	70	40	-	-	-	-	-	-	-	-	-
630	800	80	-	-	-	-	-	-	-	-	-	-
800	1,000	90	-	-	-	-	-	-	-	-	-	-
1,000	1,250	100	-	-	-	-	-	-	-	-	-	-
1,250	1,600	120	-	-	-	-	-	-	-	-	-	-
1,600	2,000	140	-	-	-	-	-	-	-	-	-	-

D (mm)		Δ_{Dmp} Deviation of mean outer diameter in a single plane									*units : μm*
		Normal		Class 6		Class 5		Class 4		Class 2	
Over	Incl.	High	Low	High	Low	High	Low	High	Low	High	Low
2.5	6	0	-8	0	-7	0	-5	0	-4	0	-2.5
6	18	0	-8	0	-7	0	-5	0	-4	0	-2.5
18	30	0	-9	0	-8	0	-6	0	-5	0	-4
30	50	0	-11	0	-9	0	-7	0	-6	0	-4
50	80	0	-13	0	-11	0	-9	0	-7	0	-4
80	120	0	-15	0	-13	0	-10	0	-8	0	-5
120	150	0	-18	0	-15	0	-11	0	-9	0	-5
150	180	0	-25	0	-18	0	-13	0	-10	0	-7
180	250	0	-30	0	-20	0	-15	0	-11	0	-8
250	315	0	-35	0	-25	0	-18	0	-13	0	-8
315	400	0	-40	0	-28	0	-20	0	-15	0	-10
400	500	0	-45	0	-33	0	-23	-	-	-	-
500	630	0	-50	0	-38	0	-28	-	-	-	-
630	800	0	-75	0	-45	0	-35	-	-	-	-
800	1,000	0	-100	0	-60	-	-	-	-	-	-
1,000	1,250	0	-125	-	-	-	-	-	-	-	-
1,250	1,600	0	-160	-	-	-	-	-	-	-	-
1,600	2,000	0	-200	-	-	-	-	-	-	-	-
2,000	2,500	0	-250	-	-	-	-	-	-	-	-

Tolerance Tables (Part 3)

units : μm D (mm)		Δ_{Dmp} Deviation of mean outer diameter in a single plane					K_{ea} Radial runout of outer ring of assembled bearing					S_D Runout of outer ring outside surface generatrix to the face		
		Normal	Class 6	Class 5	Class 4	Class 2	Normal	Class 6	Class 5	Class 4	Class 2	Class 5	Class 4	Class 2
Over	Incl.	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
2.5	6	6	5	3	2	1.5	15	8	5	3	1.5	8	4	1.5
6	18	6	5	3	2	1.5	15	8	5	3	1.5	8	4	1.5
18	30	7	6	3	2.5	2	15	9	6	4	2.5	8	4	1.5
30	50	8	7	4	3	2	20	10	7	5	2.5	8	4	1.5
50	80	10	8	5	3.5	2	25	13	8	5	4	8	4	1.5
80	120	11	10	5	4	2.5	35	18	10	6	5	9	5	2.5
120	150	14	11	6	5	2.5	40	20	11	7	5	10	5	2.5
150	180	19	14	7	5	3.5	45	23	13	8	5	10	5	2.5
180	250	23	15	8	6	4	50	25	15	10	7	11	7	4
250	315	26	19	9	7	4	60	30	18	11	7	13	8	5
315	400	30	21	10	8	5	70	35	20	13	8	13	10	7
400	500	34	25	12	-	-	80	40	23	-	-	15	-	-
500	630	38	29	14	-	-	100	50	25	-	-	18	-	-
630	800	55	34	18	-	-	120	60	30	-	-	20	-	-
800	1,000	75	45	-	-	-	140	75	-	-	-	-	-	-
1,000	1,250	-	-	-	-	-	160	-	-	-	-	-	-	-
1 250	1 600	-	-	-	-	-	190	-	-	-	-	-	-	-
1,600	2,000	-	-	-	-	-	220	-	-	-	-	-	-	-
2,000	2,500	-	-	-	-	-	250	-	-	-	-	-	-	-

units : μm D (mm)		S_{ea} Axial runout of end face to outer ring raceway of assembled bearing			V_{Cs} Variation of outer ring width		
		Class 5	Class 4	Class 2	Class 5	Class 4	Class 2
Over	Incl.	Max	Max	Max	Max	Max	Max
2.5	6	8	5	1.5	5	2.5	1.5
6	18	8	5	1.5	5	2.5	1.5
18	30	8	5	2.5	5	2.5	1.5
30	50	8	5	2.5	5	2.5	1.5
50	80	10	5	4	6	3	1.5
80	120	11	6	5	8	4	2.5
120	150	13	7	5	8	5	2.5
150	180	14	8	5	8	5	2.5
180	250	15	10	7	10	7	4
250	315	18	10	7	11	7	5
315	400	20	13	8	13	8	7
400	500	23	-	-	15	-	-
500	630	25	-	-	18	-	-
630	800	30	-	-	20	-	-
800	1,000	-	-	-	-	-	-
1,000	1,250	-	-	-	-	-	-
1,250	1,600	-	-	-	-	-	-
1,600	2,000	-	-	-	-	-	-
2,000	2,500	-	-	-	-	-	-

BEARINGS SERIES SYMBOLS

Types of Bearings	Bearing Series Symbols	Symbols Type	Dimension Symbols	
			Width or Height Symbols	Symbols
Single-Row Deep Groove Ball Bearings	68	6	(1)	8
	69	6	(1)	9
	60	6	(1)	0
	62	6	(0)	2
	63	6	(0)	3
Single Row Angular Contact Ball Bearings	79	7	(1)	9
	70	7	(1)	0
	72	7	(0)	2
	73	7	(0)	3
Self-Aligning Ball Bearings	12	1	(0)	2
	13	1	(0)	3
	22	(1)	2	2
	23	(1)	2	3
Spherical Roller Bearings	230	2	3	0
	231	2	3	1
	222	2	2	2
	232	2	3	2
	213(1)	2	0	3
	223	2	2	3
Thrust Ball Bearings	511	5	1	1
	512	5	1	2
	513	5	1	3
	514	5	1	4
	522	5	2	2
	523	5	2	3
	524	5	2	4
Taper Roller Bearings	329	3	2	9
	320	3	2	0
	330	3	3	0
	331	3	3	1
	302	3	0	2
	322	3	2	2
	332	3	3	2
	303	3	0	3
	323	3	2	3

Types of Bearings	Bearing Series Symbols	Symbols Type	Dimension Symbols	
			Width or Height Symbols	Symbols
Single-Row Cylindrical Roller Bearings	NU10	NU	1	0
	NU2	NU	(0)	2
	NU22	NU	2	2
	NU3	NU	(0)	3
	NU23	NU	2	3
	NU4	NU	(0)	4
	NJ2	NJ	(0)	2
	NJ22	NJ	2	2
	NJ3	NJ	(0)	3
	NJ23	NJ	2	3
	NJ4	NJ	(0)	4
	NUP2	NUP	(0)	2
	NUP22	NUP	2	2
	NUP3	NUP	(0)	3
	NUP23	NUP	2	3
	NUP4	NUP	(0)	4
	N10	N	1	0
	N2	N	(0)	2
	N3	N	(0)	3
	N4	N	(0)	4
	NF2	NF	(0)	2
	NF3	NF	(0)	3
	NF4	NF	(0)	4
Double Row Cylindrical Roller Bearing	NNU49	NNU	4	9
	NN30	NNU	3	0
Thrust Spherical Roller Bearings	292	2	9	2
	293	2	9	3
	294	2	9	4
Needle Roller Bearings	NA48	N/A	4	8
	NA49	N/A	4	9
	NA59	N/A	5	9
	NA69	N/A	6	9

Note
Numbers in "( )" are normally omitted from the bearing numbers.

BEARINGS SUPPLEMENTARY DESIGNATIONS

Frequently Used Suffixes of Bearing Numbers

Attribute	Supplementary Designation			
	Local	SKF	FAG	NSK
Contact Angle Symbol				
Standard contact angle of 30°	A			A
Standard contact angle of 25°	A5	ACD	E	A5
Standard contact angle of 40°	B	B	B	B
Standard contact angle of 15°	C	CD	C	C
Contact angle about 20° (only applied to Tapered Roller Bearings)	C			C
Contact angle about 28° (only applied to Tapered Roller Bearings)	D			D
Internal Design Symbol				
Internal design differs from standard	A	A	A	A
Smaller diameter of outer ring raceway, contact angle, and outer ring width of tapered roller bearings conform to ISO 355	J	X/Q	X	J
Material Symbol				
Case-hardened steel used in rings, rolling elements	G			G
Stainless steel used in rings, rolling elements	H		Z	H
Cage Symbol				
Machined brass cage	M	M	M	M
Synthetic resin cage	T	TN9	TV	T
Pressed steel cage	W	F	F	W
Without cage	V	V	V	V
External Features – Seals, Shields Symbol				
Shield on one side only	Z / ZS	Z	ZR	Z / ZS
Shield on both sides	ZZ / ZZS	2Z	2ZR	ZZ / ZZS
Contact rubber seal on one side only	D / DU	RS	RSR	D / DU
Contact rubber shield on both sides	DD / DDU	2RS	2RSR	DD / DDU
Non-contact rubber seal on one side only	V	RZ		V
Non-contact rubber seal on both sides	VV	2RZ		VV
Rings Design Symbol				
Tapered bore of inner ring (Taper 1:12)	K	K	K	K
Tapered bore of inner ring (Taper 1:30)	K30	K30	K30	K30
Notch or lubricating groove ring	E	E	E	E
Lubricating groove in outside surface and holes in outer ring	E4	E	S	E4
Snap ring groove in outer ring	N	N	N	N
Snap ring groove with snap ring in outer ring	NR	NR	NR	NR
Bearing Arrangement Symbol				
Back to back arrangement	DB	DB	UA	DB
Face to face arrangement	DF	DF	UO	DF
Tandem arrangement	DT	DT	UL	DT
Internal Clearance Symbol				
Clearance less than C2	C1	C1	C1	C1
Clearance less than CN	C2	C2	C2	C2
CN Clearance	CN	C0	C0	CN
Clearance greater than CN	C3	C3	C3	C3
Clearance greater than C3	C4	C4	C4	C4
Clearance greater than C4	C5	C5	C5	C5
Tolerance Class Symbol				
ISO normal (P0 is usually omitted from the bearing numbers)	P0	P0	P0	P0
ISO Class 6	P6	P6	P6	P6
ISO Class 5	P5	P5	P5	P5
ISO Class 4	P4	P4	P4	P4
ISO Class 2	P2			P2
Special Specification Symbol				
Working temperature lower than 150°C	X26	S0	S0	X26
Working temperature lower than 200°C	X28	S1	S1	X28
Working temperature lower than 250°C	X29	S2	S2	X29
Dimensional stabilizing treatment working temperature lower than 200°C	S11	S1	S1	S11

COMPETITIVE PRODUCTS & PRODUCTS GALLERY

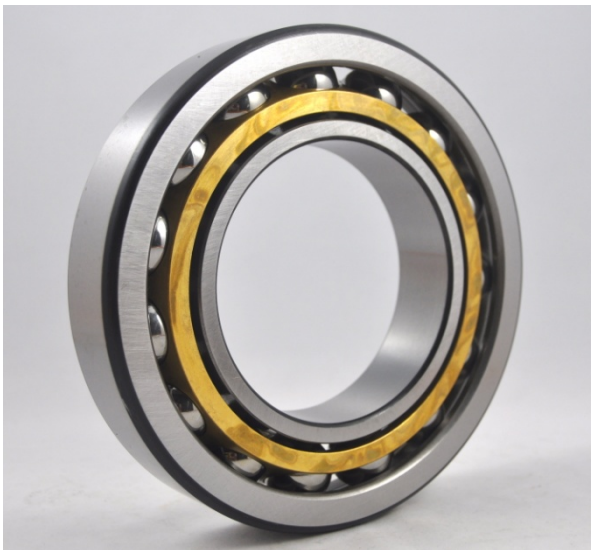
COMPETITIVE PRODUCTS LIST

Below listed products are technically established, available in stock or within the shortest possible delivery lead-time, and lowest requirement of minimum order. Please contact us if you are looking for something out of the list.

- Deep Groove Ball Bearings
  - Single Row Deep Groove Ball Bearings
  - Double Row Deep Groove Ball Bearings
- Angular Contact Ball Bearings
  - Single Row Angular Contact Ball Bearings
  - Double Row Angular Contact Ball Bearings
  - Four Point Contact Ball Bearings
- Self-Aligning Ball Bearings
- Spherical Roller Bearings
- Thrust Ball Bearings
  - Single Direction Thrust Ball Bearings
  - Double Direction Thrust Ball Bearings
- Thrust Spherical Roller Bearings
- Cylindrical Roller Bearings
  - Single Row Cylindrical Roller Bearings
  - Double Row Cylindrical Roller Bearings
  - Full Complement Type Cylindrical Roller Bearings
    - Full Complement Type Single Row Cylindrical Roller Bearings
    - Full Complement Type Double Row Cylindrical Roller Bearings
- Tapered Roller Bearings
  - Single Row Tapered Roller Bearings
  - Double Row Tapered Roller Bearings
- Needle Roller Bearings
  - Needle Rollers & Cage Assemblies
  - Drawn Cup Needle Roller Bearings
  - Solid Needle Roller Bearings
  - Cam Rollers
  - Cam Followers
- High Precision Bearings
  - High Precision Angular Contact Ball Bearings
    - Single Row High Precision Cylindrical Roller Bearings
    - Double Row High Precision Cylindrical Roller Bearings
- Bearing Units
  - Pillow Type Units
    - UCP Series
    - UKT Series
  - Square Four Bolt Flange Type Units
    - UCF Series
    - UKF Series
  - Oval Flange Type Units
    - UCFL Series
    - UKFL Series
  - Round Flange Cartridge Type Units
    - UCFC Series
    - UKFC Series
  - Take Up Type Units
    - UCT Series
    - UKT Series
  - Ball Bearing Inserts
    - UC, SB, SU Series
    - NA Series
    - ER, RB Series

PRODUCTS GALLERY

DEEP GROOVE BALL BEARINGS



ANGULAR CONTACT BALL BEARINGS

SELF-ALIGNING BALL BEARINGS

SPHERICAL ROLLER BEARINGS

THRUST BALL BEARINGS

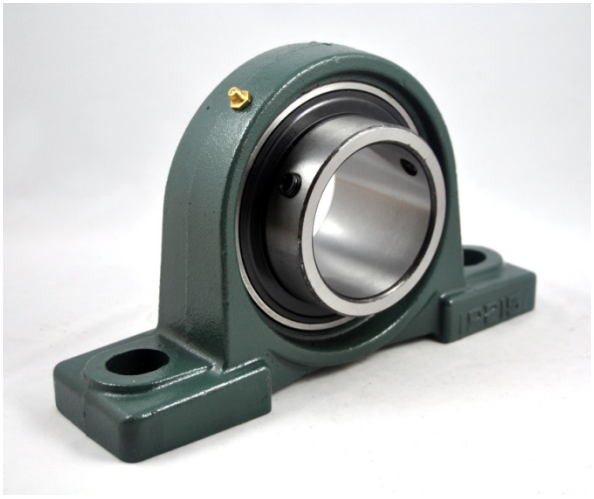
THRUST SPHERICAL ROLLER BEARINGS

CYLINDRICAL ROLLER BEARINGS

TAPERED ROLLER BEARINGS

NEEDLE ROLLER BEARINGS

HIGH PRECISION BEARINGS

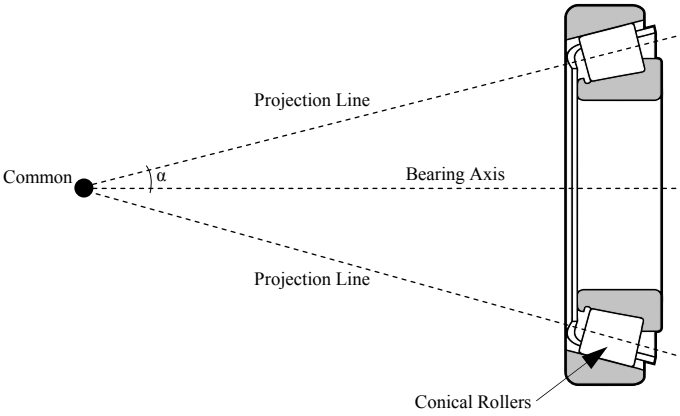


BEARING UNITS

BEARING TABLES

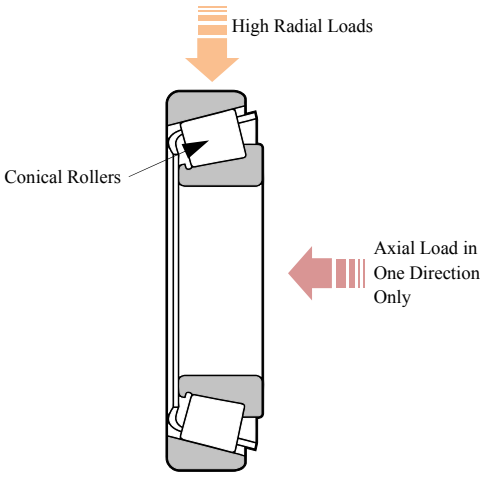
TAPERED ROLLER BEARINGS

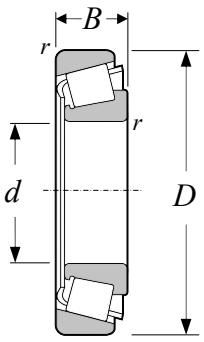
Tapered roller bearings are designed to particularly accommodate combined loads, which are radial and axial loads simultaneously. The inner and outer rings of tapered roller bearings are both tapered where the conical rollers are arranged. The axial projection lines of these conical rollers are meeting at a common point of the bearing axis. The greater the angle (a) of these projection lines comes with the greater capability of the bearings to carry axial loads. Tapered roller bearings are generally separable, the cone which consisting of the conical rollers and cage assemblies can be mounted separately from the outer ring.



Single Row Tapered Roller Bearings

Single row tapered roller bearings has one row of conical rollers guided in the tapered raceway at a certain angle. They support high combination of simultaneous radial and axial loads. However, single row tapered roller bearings are able to carry axial load in one direction only.

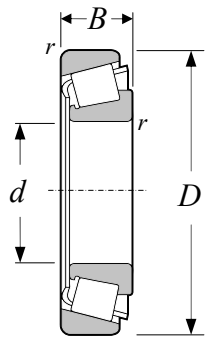




TAPERED ROLLER BEARINGS
Single Row

Table 107
Bore Diameter 15mm - 40mm

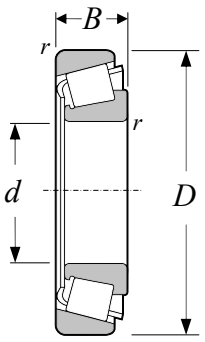
Principal Dimensions			Basic Load Ratings		Speed Ratings		Mass	Designations			
			Dynamic	Static	Ref. Speed	Limiting Speed					
d	D	B	C	C_0							
mm			kN		r/min		kg	Local	SKF	FAG	NSK
15	42	14.25	22.4	20	13000	18000	0.095	30302 J	30302 J2	30302 A	30302 J
17	40	13.25	19	18.6	13000	18000	0.075	30203 J	30203 J2	30203 A	30203 J
17	47	15.25	28.1	25	12000	16000	0.13	30303 J	30303 J2	30303 A	30303 J
17	47	20.25	34.7	33.5	11000	16000	0.17	32303 J	32303 J2/Q	32303 A	32303 J
20	42	15	24.2	27	12000	16000	0.097	32004 J	32004 X/Q	32004 A	32004 J
20	47	15.25	27.5	28	11000	15000	0.12	30204 J	30204 J2/Q	30204 A	30204 J
20	52	16.25	34.1	32.5	11000	14000	0.17	30304 J	30304 J2/Q	30304 A	30304 J
20	52	22.25	44	45.5	10000	14000	0.23	32304 J	32304 J2/Q	32304 A	32304 J
22	44	15	25.1	29	11000	15000	0.1	320/22 J	320/22 X	320/22 A	320/22 J
25	47	15	27	32.5	11000	14000	0.11	32005 J	32005 X/Q	32005 A	32005 J
25	52	16.25	30.8	33.5	10000	13000	0.15	30205 J	30205 J2/Q	30205 A	30205 J
25	52	19.25	35.8	44	9500	13000	0.19	32205 J	32205 BJ2/Q	32205 A	32205 J
25	52	22	47.3	56	10000	13000	0.23	33205 J	33205 Q	33205 A	33205 J
25	62	18.25	44.6	43	9000	12000	0.26	30305 J	30305 J2	30305 A	30305 J
25	62	18.25	38	40	7500	11000	0.26	31305 J	31305 J2	31305 A	31305 J
25	62	25.25	60.5	63	8000	12000	0.36	32305 J	32305 J2	32305 A	32305 J
28	52	16	31.9	38	10000	13000	0.15	320/28 J	320/28 X/Q	320/28 A	320/28 J
28	58	17.25	38	41.5	9000	12000	0.25	302/28 J	302/28 J2	302/28 A	302/28 J
28	58	20.25	41.8	50	8500	12000	0.25	322/28 J	322/28 BJ2/Q	322/28 A	322/28 J
30	55	17	35.8	44	9000	12000	0.17	32006 J	32006 X/Q	32006 A	32006 J
30	62	17.25	40.2	44	8500	11000	0.23	30206 J	30206 J2/Q	30206 A	30206 J
30	62	21.25	49.5	58.5	8000	11000	0.3	32206 J	32206 BJ2/QCL7CVA606	32206 A	32206 J
30	62	21.25	50.1	57	8500	11000	0.28	32206 J	32206 J2/Q	32206 A	32206 J
30	62	25	64.4	76.5	7500	11000	0.37	33206 J	33206 Q	33206 A	33206 J
30	72	20.75	56.1	56	7500	10000	0.39	30306 J	30306 J2/Q	30306 A	30306 J
30	72	20.75	47.3	50	6700	9500	0.39	31306 J	31306 J2/Q	31306 A	31306 J
30	72	28.75	76.5	85	7000	10000	0.55	32306 J	32306 J2/Q	32306 A	32306 J
32	58	17	36.9	46.5	8500	11000	0.19	320/32 J	320/32 X/Q	320/32 A	320/32 J
35	62	18	37.4	49	8000	11000	0.22	32007 J	32007 J2/Q	32007 A	32007 J
35	62	18	42.9	54	8500	11000	0.22	32007 J	32007 X/Q	32007 A	32007 J
35	72	18.25	51.2	56	7000	9500	0.32	30207 J	30207 J2/Q	30207 A	30207 J
35	72	24.25	66	78	7000	9500	0.43	32207 J	32207 J2/Q	32207 A	32207 J
35	72	28	84.2	106	6300	9500	0.56	33207 J	33207 Q	33207 A	33207 J
35	80	22.75	72.1	73.5	6700	9000	0.52	30307 J	30307 J2/Q	30307 A	30307 J
35	80	22.75	72.1	73.5	6700	9000	0.52	30307 J	30307 RJ2/Q	30307 A	30307 J
35	80	22.75	61.6	67	6000	8500	0.52	31307 J	31307 J2/Q	31307 A	31307 J
35	80	32.75	93.5	114	6000	8500	0.8	32307 J	32307 BJ2/Q	32307 A	32307 J
35	80	32.75	95.2	106	6300	9000	0.73	32307 J	32307 J2/Q	32307 A	32307 J
37	80	32.75	93.5	114	6000	8500	0.8	32307/37 J	32307/37 BJ2/Q	32307/37 A	32307/37 J
38	68	19	52.8	71	7000	9500	0.27	32008/38 J	32008/38 X/Q	32008/38 A	32008/38 J
40	68	19	52.8	71	7000	9500	0.27	32008 J	32008 X/Q	32008 A	32008 J
40	68	19	52.8	71	7000	9500	0.27	32008 J	32008 XR/QVA621	32008 A	32008 J
40	68	19	52.8	71	7000	9500	0.27	32008 T	32008 XTN9/Q	32008 TVP	32008 T
40	75	26	79.2	104	6700	9000	0.51	33108 J	33108 Q	33108 A	33108 J
40	80	19.75	61.6	68	6300	8500	0.42	30208 J	30208 J2/Q	30208 A	30208 J
40	80	19.75	61.6	68	6300	8500	0.42	30208 J	30208 RJ2/Q	30208 A	30208 J
40	80	24.75	78.8	86.5	6300	8500	0.53	32208 J	32208 J2/Q	32208 A	32208 J
40	80	32	105	132	5600	8500	0.77	33208 J	33208 QCL7C	33208 A	33208 J
40	90	25.25	85.8	95	6000	8000	0.72	30308 J	30308 J2/Q	30308 A	30308 J
40	90	25.25	85	81.5	5600	7500	0.72	31308 J	31308 J2/QCL7C	31308 A	31308 J



TAPERED ROLLER BEARINGS
Single Row

Table 108
Bore Diameter 40mm - 65mm

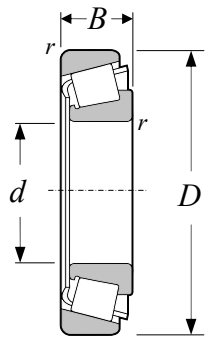
Principal Dimensions			Basic Load Ratings		Speed Ratings		Mass	Designations			
			Dynamic	Static	Ref. Speed	Limiting Speed					
d	D	B	C	C_0							
mm			kN		r/min		kg	Local	SKF	FAG	NSK
40	90	35.25	117	140	5300	8000	1	32308 J	32308 J2/Q	32308 A	32308 J
45	75	20	58.3	80	6300	8500	0.34	32009 J	32009 X/Q	32009 A	32009 J
45	80	26	96.5	114	6700	8000	0.56	33109 J	33109 Q	33109 A	33109 J
45	85	20.75	66	76.5	6000	8000	0.48	30209 J	30209 J2/Q	30209 A	30209 J
45	85	24.75	91.5	98	6300	8000	0.58	32209 J	32209 J2/Q	32209 A	32209 J
45	85	32	108	143	5300	7500	0.82	33209 J	33209 Q	33209 A	33209 J
45	90	24.75	82.5	104	5300	8000	0.65	32210/45 J	32210/45 BJ2/QVB022	32210/45 A	32210/45 J
45	100	27.25	108	120	5300	7000	0.97	30309 J	30309 J2/Q	30309 A	30309 J
45	100	27.25	106	102	5000	6700	0.95	31309 J	31309 J2/QCL7C	31309 A	31309 J
45	100	38.25	134	176	4800	6700	1.45	32309 J	32309 BJ2/QCL7C	32309 A	32309 J
45	100	38.25	134	176	4800	6700	1.5	32309 J	32309 BRJ2/QCL7C	32309 A	32309 J
45	100	38.25	140	170	4800	7000	1.35	32309 J	32309 J2/Q	32309 A	32309 J
50	80	20	60.5	88	6000	8000	0.37	32010 J	32010 X/Q	32010 A	32010 J
50	80	20	60.5	88	6000	8000	0.37	32010 J	32010 X/QCL7CVB026	32010 A	32010 J
50	80	24	69.3	102	6000	8000	0.45	33010 J	33010 Q	33010 A	33010 J
50	85	26	85.8	122	5600	7500	0.59	33110 J	33110 Q	33110 A	33110 J
50	90	21.75	76.5	91.5	5600	7500	0.54	30210 J	30210 J2/Q	30210 A	30210 J
50	90	24.75	82.5	100	5600	7500	0.61	32210 J	32210 J2/Q	32210 A	32210 J
50	90	32	114	160	5000	7000	0.9	33210 J	33210 Q	33210 A	33210 J
50	110	29.25	143	140	5300	6300	1.25	30310 J	30310 J2/Q	30310 A	30310 J
50	110	29.25	122	120	4500	6000	1.2	31310 J	31310 J2/QCL7C	31310 A	31310 J
50	110	42.25	183	216	4500	6000	1.85	32310 J	32310 BJ2/QCL7C	32310 A	32310 J
50	110	42.25	172	212	4300	6300	1.8	32310 J	32310 J2/Q	32310 A	32310 J
50	110	42.25	172	212	4300	6300	1.8	32310 T	32310 TN9	32310 TVP	32310 T
55	90	23	80.9	116	5300	7000	0.55	32011 J	32011 X/Q	32011 A	32011 J
55	90	27	104	137	5600	7000	0.67	33011 J	33011 Q	33011 A	33011 J
55	95	30	110	156	5000	6700	0.86	33111 J	33111 Q	33111 A	33111 J
55	100	22.75	104	106	5300	6700	0.7	30211 J	30211 J2/Q	30211 A	30211 J
55	100	26.75	106	129	5000	6700	0.83	32211 J	32211 J2/Q	32211 A	32211 J
55	100	35	138	190	4500	6300	1.2	33211 J	33211 Q	33211 A	33211 J
55	120	31.5	166	163	4800	5600	1.55	30311 J	30311 J2/Q	30311 A	30311 J
55	120	31.5	121	137	3800	5600	1.55	31311 J	31311 J2/QCL7C	31311 A	31311 J
55	120	45.5	216	260	4300	5600	2.5	32311 J	32311 BJ2/QCL7C	32311 A	32311 J
55	120	45.5	216	260	4300	5600	2.5	32311 J	32311 BRJ2/QCL7C	32311 A	32311 J
55	120	45.5	198	250	4000	5600	2.3	32311 J	32311 J2	32311 A	32311 J
60	95	23	95	122	5300	6700	0.59	32012 J	32012 X/QCL7C	32012 A	32012 J
60	95	27	106	143	5300	6700	0.71	33012 J	33012 Q	33012 A	33012 J
60	100	30	117	170	4800	6300	0.92	33112 J	33112 Q	33112 A	33112 J
60	110	23.75	112	114	5000	6000	0.88	30212 J	30212 J2/Q	30212 A	30212 J
60	110	29.75	125	160	4500	6000	1.15	32212 J	32212 J2/Q	32212 A	32212 J
60	110	38	168	236	4000	6000	1.6	33212 J	33212 Q	33212 A	33212 J
60	130	33.5	168	196	4000	5300	1.95	30312 J	30312 J2/Q	30312 A	30312 J
60	130	33.5	145	166	3600	5300	1.9	31312 J	31312 J2/Q	31312 A	31312 J
60	130	48.5	220	305	3600	5000	2.8	32312 J	32312 BJ2/QCL7C	32312 A	32312 J
60	130	48.5	229	290	3600	5300	2.85	32312 J	32312 J2/Q	32312 A	32312 J
65	100	23	96.5	127	5000	6000	0.63	32013 J	32013 X/Q	32013 A	32013 J
65	100	27	110	153	5000	6300	0.78	33013 J	33013 Q	33013 A	33013 J
65	110	34	142	208	4300	5600	1.3	33113 J	33113 R/Q	33113 A	33113 J
65	110	34	142	208	4300	5600	1.3	33113 J	33113 Q	33113 A	33113 J
65	120	24.75	132	134	4500	5600	1.15	30213 J	30213 J2/Q	30213 A	30213 J



TAPERED ROLLER BEARINGS
Single Row

Table 109
Bore Diameter 65mm - 90mm

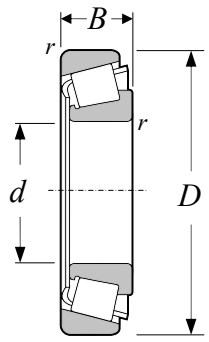
Principal Dimensions			Basic Load Ratings		Speed Ratings		Mass	Designations			
			Dynamic	Static	Ref. Speed	Limiting Speed					
d	D	B	C	C_0							
mm			kN		r/min		kg	Local	SKF	FAG	NSK
65	120	32.75	151	193	4000	5600	1.5	32213 J	32213 J2/Q	32213 A	32213 J
65	120	41	194	270	3800	5300	2.05	33213 T	33213 TN9/Q	33213 TVP	33213 T
65	120	41	194	270	3800	5300	2.05	33213 J	33213 Q	33213 A	33213 J
65	140	36	194	228	3600	4800	2.4	30313 J	30313 J2/Q	30313 A	30313 J
65	140	36	194	228	3600	4800	2.4	30313 J	30313 RJ2	30313 A	30313 J
65	140	36	165	193	3200	4800	2.35	31313 J	31313 J2/QCL7C	31313 A	31313 J
65	140	51	246	345	3200	4800	3.35	32313 J	32313 BJ2/QU4CL7CVQ267	32313 A	32313 J
65	140	51	264	335	3400	4800	3.45	32313 J	32313 J2/Q	32313 A	32313 J
70	110	25	101	153	4300	5600	0.84	32014 J	32014 X/Q	32014 A	32014 J
70	110	31	130	196	4300	5600	1.1	33014 J	33014 Q	33014 A	33014 J
70	120	37	172	250	4000	5300	1.7	33114 J	33114 Q	33114 A	33114 J
70	125	26.25	125	156	4000	5300	1.25	30214 J	30214 J2/Q	30214 A	30214 J
70	125	33.25	157	208	3800	5300	1.6	32214 J	32214 J2/Q	32214 A	32214 J
70	125	41	201	285	3600	5000	2.1	33214 J	33214 Q	33214 A	33214 J
70	150	38	220	260	3400	4500	2.9	30314 J	30314 J2/Q	30314 A	30314 J
70	150	38	187	220	3000	4500	2.95	31314 J	31314 J2/QCL7C	31314 A	31314 J
70	150	54	281	400	3000	4300	4.25	32314 J	32314 BJ2/QCL7C	32314 A	32314 J
70	150	54	297	380	3200	4500	4.3	32314 J	32314 J2/Q	32314 A	32314 J
75	105	20	70.4	116	4300	6300	0.52	32915 T	32915 TN9/QVG900	32915 TVP	32915 T
75	115	25	106	163	4000	5300	0.9	32015 J	32015 X/Q	32015 A	32015 J
75	115	31	134	228	4000	5300	1.15	33015 J	33015 Q	33015 A	33015 J
75	125	37	176	265	3800	5000	1.8	33115 J	33115 Q	33115 A	33115 J
75	130	27.25	140	176	3800	5000	1.4	30215 J	30215 J2/Q	30215 A	30215 J
75	130	33.25	161	212	3600	5000	1.7	32215 J	32215 J2/Q	32215 A	32215 J
75	130	41	209	300	3400	4800	2.25	33215 J	33215 Q	33215 A	33215 J
75	160	40	246	290	3200	4300	3.45	30315 J	30315 J2/Q	30315 A	30315 J
75	160	40	209	245	2800	4300	3.5	31315 J	31315 J2/QCL7C	31315 A	31315 J
75	160	58	336	475	2800	4000	5.55	32315 J	32315 BJ2/QCL7C	32315 A	32315 J
75	160	58	336	440	3000	4300	5.2	32315 J	32315 J2	32315 A	32315 J
80	125	29	138	216	3600	5000	1.3	32016 J	32016 X/Q	32016 A	32016 J
80	125	36	168	285	3600	5000	1.65	33016 J	33016 Q	33016 A	33016 J
80	130	37	179	280	3600	4800	1.9	33116 T	33116 TN9/Q	33116 TVP	33116 T
80	130	37	179	280	3600	4800	1.9	33116 J	33116 Q	33116 A	33116 J
80	140	28.25	151	183	3400	4800	1.6	30216 J	30216 J2/Q	30216 A	30216 J
80	140	35.25	187	245	3400	4500	2.05	32216 J	32216 J2/Q	32216 A	32216 J
80	140	46	251	375	3200	4500	2.9	33216 J	33216 Q	33216 A	33216 J
80	170	42.5	270	320	3000	4300	4.1	30316 J	30316 J2	30316 A	30316 J
80	170	42.5	224	265	2800	4000	4.05	31316 J	31316 J1/QCL7C	31316 A	31316 J
80	170	61.5	380	500	3000	4300	6.2	32316 J	32316 J2	32316 A	32316 J
85	130	29	140	224	3400	4800	1.35	32017 J	32017 X/Q	32017 A	32017 J
85	130	36	183	310	3600	4800	1.75	33017 J	33017 Q	33017 A	33017 J
85	140	41	220	340	3400	4500	2.45	33117 J	33117 Q	33117 A	33117 J
85	150	30.5	176	220	3200	4300	2.05	30217 J	30217 J2/Q	30217 A	30217 J
85	150	38.5	212	285	3200	4300	2.6	32217 J	32217 J2/Q	32217 A	32217 J
85	150	49	286	430	3000	4300	3.7	33217 J	33217 Q	33217 A	33217 J
85	180	44.5	303	365	2800	4000	4.85	30317 J	30317 J2	30317 A	30317 J
85	180	44.5	242	285	2600	3800	4.6	31317 J	31317 J2	31317 A	31317 J
85	180	63.5	391	560	2800	4000	7.5	32317 J	32317 BJ2	32317 A	32317 J
85	180	63.5	402	530	2800	4000	6.85	32317 J	32317 J2	32317 A	32317 J
90	140	32	168	270	3200	4300	1.75	32018 J	32018 X/Q	32018 A	32018 J



TAPERED ROLLER BEARINGS
Single Row

Table 110
Bore Diameter 90mm - 130mm

Principal Dimensions			Basic Load Ratings		Speed Ratings		Mass	Designations			
			Dynamic	Static	Ref. Speed	Limiting Speed					
d	D	B	C	C_0							
mm			kN		r/min		kg	Local	SKF	FAG	NSK
90	140	39	216	355	3200	4500	2.2	33018 J	33018 Q	33018 A	33018 J
90	150	45	251	390	3000	4300	3.1	33118 T	33118 TN9/Q	33118 TVP	33118 T
90	150	45	251	390	3000	4300	3.1	33118 J	33118 Q	33118 A	33118 J
90	160	32.5	194	245	3000	4000	2.55	30218 J	30218 J2	30218 A	30218 J
90	160	42.5	251	340	3000	4000	3.35	32218 J	32218 J2/Q	32218 A	32218 J
90	190	46.5	330	400	2600	4000	5.65	30318 J	30318 J2	30318 A	30318 J
90	190	46.5	264	315	2400	3400	5.9	31318 J	31318 J2	31318 A	31318 J
90	190	67.5	457	610	2600	4000	8.4	32318 J	32318 J2	32318 A	32318 J
95	145	32	168	270	3200	4300	1.8	32019 J	32019 X/Q	32019 A	32019 J
95	145	39	220	375	3200	4300	2.3	33019 J	33019 Q	33019 A	33019 J
95	170	34.5	216	275	2800	3800	3	30219 J	30219 J2	30219 A	30219 J
95	170	45.5	281	390	2800	3800	4.05	32219 J	32219 J2	32219 A	32219 J
95	200	49.5	330	390	2600	3400	6.7	30319	30319	30319	30319
95	200	49.5	292	355	2400	3400	6.95	31319 J	31319 J2	31319 A	31319 J
95	200	71.5	501	670	2400	3400	11	32319 J	32319 J2	32319 A	32319 J
100	140	25	119	204	3200	4800	1.15	32920 J	32920 Q	32920 A	32920 J
100	150	32	172	280	3000	4000	1.9	32020 J	32020 X/Q	32020 A	32020 J
100	150	39	224	390	3000	4000	2.4	33020 J	33020 Q	33020 A	33020 J
100	180	37	246	320	2800	3600	3.65	30220 J	30220 J2	30220 A	30220 J
100	180	49	319	440	2600	3600	4.9	32220 J	32220 J2	32220 A	32220 J
100	180	63	429	655	2400	3600	6.95	33220	33220	33220	33220
100	215	51.5	402	490	2400	3200	8.05	30320 J	30320 J2	30320 A	30320 J
100	215	56.5	374	465	2200	3000	8.6	31320 J	31320 XJ2/CL7CVQ051	31320 A	31320 J
100	215	77.5	572	780	2200	3000	12.5	32320 J	32320 J2	32320 A	32320 J
105	160	35	201	335	2800	3800	2.4	32021 J	32021 X/Q	32021 A	32021 J
105	160	43	246	430	2800	3800	3.05	33021 J	33021 Q	33021 A	33021 J
105	190	39	270	355	2600	3400	4.25	30221 J	30221 J2	30221 A	30221 J
105	190	53	358	510	2600	3400	6	32221 J	32221 J2	32221 A	32221 J
105	225	81.5	605	815	2000	3000	14.5	32321 J	32321 J2	32321 A	32321 J
110	150	25	125	224	3000	4300	1.25	32922 J	32922 X/Q	32922 A	32922 J
110	170	38	233	390	2600	3600	3.05	32022 J	32022 X/Q	32022 A	32022 J
110	170	47	281	500	2600	3600	3.85	33022	33022	33022	33022
110	180	56	369	630	2600	3400	5.55	33122	33122	33122	33122
110	200	41	308	405	2400	3200	5.1	30222 J	30222 J2	30222 A	30222 J
110	200	56	402	570	2400	3200	7.1	32222 J	32222 J2	32222 A	32222 J
110	240	54.5	473	585	2200	2800	11	30322 J	30322 J2	30322 A	30322 J
110	240	63	457	585	1900	2800	12	31322 J	31322 XJ2	31322 A	31322 J
110	240	84.5	627	830	1900	2800	17	32322	32322	32322	32322
120	165	29	165	305	2600	3800	1.8	32924	32924	32924	32924
120	180	38	242	415	2400	3400	3.25	32024 J	32024 X	32024 A	32024 J
120	180	48	292	540	2600	3400	4.2	33024	33024	33024	33024
120	215	43.5	341	465	2200	3000	6.15	30224 J	30224 J2	30224 A	30224 J
120	215	61.5	468	695	2200	3000	9.15	32224 J	32224 J2	32224 A	32224 J
120	260	59.5	561	710	2000	2600	14	30324 J	30324 J2	30324 A	30324 J
120	260	68	539	695	1700	2400	15.5	31324 J	31324 XJ2	31324 A	31324 J
120	260	90.5	792	1120	1800	2600	21.5	32324 J	32324 J2	32324 A	32324 J
130	180	32	198	365	2400	3600	2.4	32926	32926	32926	32926
130	200	45	314	540	2200	3000	4.95	32026 J	32026 X	32026 A	32026 J
130	230	43.75	369	490	2000	2800	7.6	30226 J	30226 J2	30226 A	30226 J
130	230	67.75	550	830	2000	2800	11.5	32226 J	32226 J2	32226 A	32226 J



TAPERED ROLLER BEARINGS
Single Row

Table 111
Bore Diameter 130mm - 360mm

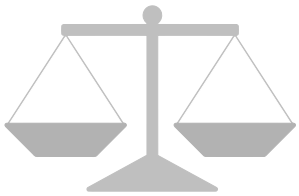
Principal Dimensions			Basic Load Ratings		Speed Ratings		Mass	Designations			
			Dynamic	Static	Ref. Speed	Limiting Speed					
d	D	B	C	C_0							
mm			kN		r/min		kg	Local	SKF	FAG	NSK
130	280	63.75	627	800	1800	2400	17	30326 J	30326 J2	30326 A	30326 J
130	280	72	605	780	1600	2400	18.5	31326 J	31326 XJ2	31326 A	31326 J
140	190	32	205	390	2200	3400	2.55	32928	32928	32928	32928
140	210	45	330	585	2200	2800	5.25	32028 J	32028 X	32028 A	32028 J
140	250	45.75	418	570	1900	2600	8.65	30228 J	30228 J2	30228 A	30228 J
140	250	71.75	644	1000	1900	2600	14.5	32228 J	32228 J2	32228 A	32228 J
140	300	77	693	900	1500	2200	24.5	31328 J	31328 XJ2	31328 A	31328 J
150	225	48	369	655	2000	2600	6.35	32030 J	32030 X	32030 A	32030 J
150	225	59	457	865	2000	2600	8.15	33030	33030	33030	33030
150	270	49	429	560	1800	2400	11	30230	30230	30230	30230
150	270	77	737	1140	1700	2400	17.5	32230 J	32230 J2	32230 A	32230 J
150	320	82	781	1020	1400	2000	29.5	31330 J	31330 XJ2	31330 A	31330 J
160	240	51	429	780	1800	2400	7.75	32032 J	32032 X	32032 A	32032 J
160	290	52	528	735	1600	2200	13	30232 J	30232 J2	30232 A	30232 J
160	290	84	880	1400	1600	2200	25.5	32232 J	32232 J2	32232 A	32232 J
160	340	75	913	1180	1500	2000	29	30332 J	30332 J2	30332 A	30332 J
170	230	38	286	585	1900	2800	4.5	32934	32934	32934	32934
170	260	57	512	915	1700	2200	10.5	32034 J	32034 X	32034 A	32034 J
170	310	57	616	865	1500	2000	19	30234 J	30234 J2	30234 A	30234 J
170	310	91	1010	1630	1500	2000	28.5	32234 J	32234 J2	32234 A	32234 J
180	250	45	352	735	1700	2600	6.65	32936	32936	32936	32936
180	280	64	644	1160	1600	2200	14.5	32036 J	32036 X	32036 A	32036 J
180	320	57	583	815	1500	2000	20	30236 J	30236 J2	30236 A	30236 J
180	320	91	1010	1630	1400	1900	29.5	32236 J	32236 J2	32236 A	32236 J
190	260	45	358	765	1600	2400	7	32938	32938	32938	32938
190	290	64	660	1200	1500	2000	15	32038 J	32038 X	32038 A	32038 J
190	340	60	721	1000	1400	1800	24	30238 J	30238 J2	30238 A	30238 J
200	280	51	473	950	1500	2200	9.5	32940	32940	32940	32940
200	310	70	748	1370	1400	1900	19.5	32040 J	32040 X	32040 A	32040 J
200	360	64	792	1120	1300	1700	25	30240 J	30240 J2	30240 A	30240 J
200	360	104	1210	2000	1300	1700	42.5	32240 J	32240 J2	32240 A	32240 J
220	300	51	484	1000	1400	2000	10	32944	32944	32944	32944
220	340	76	897	1660	1300	1700	25.5	32044 J	32044 X	32044 A	32044 J
220	400	72	990	1400	1200	1600	40	30244 J	30244 J2	30244 A	30244 J
220	400	114	1610	2700	1100	1500	60	32244 J	32244 J2	32244 A	32244 J
240	320	51	512	1080	1300	1900	11	32948	32948	32948	32948
240	360	76	935	1800	1200	1600	27.5	32048 J	32048 X	32048 A	32048 J
240	440	127	1940	3350	1000	1400	81.5	32248 J	32248 J2/HA1	32248 A	32248 J
260	400	87	1170	2200	1100	1400	40	32052 J	32052 X	32052 A	32052 J
260	480	137	2200	3650	900	1200	105	32252 J	32252 J2/HA1	32252 A	32252 J
260	540	113	2120	3050	850	1200	110	30352 J	30352 J2	30352 A	30352 J
280	380	63.5	765	1660	1100	1600	20	32956 J	32956 C02	32956 A	32956 J
280	420	87	1210	2360	1000	1300	40.5	32056 J	32056 X	32056 A	32056 J
300	420	76	1050	2240	950	1400	32	32960	32960	32960	32960
300	460	100	1540	3000	900	1200	58	32060 J	32060 X	32060 A	32060 J
300	540	149	2750	4750	800	1100	140	32260 J	32260 J2/HA1	32260 A	32260 J
320	440	76	1080	2360	900	1300	33.5	32964	32964	32964	32964
320	480	100	1540	3100	850	1100	64	32064 J	32064 X	32064 A	32064 J
340	460	76	1080	2400	850	1300	35	32968	32968	32968	32968
360	480	76	1120	2550	800	1200	37	32972	32972	32972	32972

APPENDICES CONTENTS

CONVERSION TABLE [N-kgf] [kg-lb]

N	-	*kgf*	*N*	-	*kgf*
9.8066	1	0.1020	500.14	51	5.2006
19.613	2	0.2039	509.95	52	5.3025
29.420	3	0.3059	519.75	53	5.4045
39.227	4	0.4079	529.56	54	5.5065
49.033	5	0.5099	539.37	55	5.6084
58.840	6	0.6118	549.17	56	5.7104
68.647	7	0.7138	558.98	57	5.8124
78.453	8	0.8158	568.79	58	5.9144
88.260	9	0.9177	578.59	59	6.0163
98.066	10	1.0197	588.40	60	6.1183
107.87	11	1.1217	598.21	61	6.2203
117.68	12	1.2237	608.01	62	6.3222
127.49	13	1.3256	617.82	63	6.4242
137.29	14	1.4276	627.63	64	6.5262
147.10	15	1.5296	637.43	65	6.6282
156.91	16	1.6315	647.24	66	6.7301
166.71	17	1.7335	657.05	67	6.8321
176.52	18	1.8355	666.85	68	6.9341
186.33	19	1.9375	676.66	69	7.0360
196.13	20	2.0394	686.47	70	7.1380
205.94	21	2.1414	696.27	71	7.2400
215.75	22	2.2434	706.08	72	7.3420
225.55	23	2.3453	715.89	73	7.4439
235.36	24	2.4473	725.69	74	7.5459
245.17	25	2.5493	735.50	75	7.6479
254.97	26	2.6513	745.31	76	7.7498
264.78	27	2.7532	755.11	77	7.8518
274.59	28	2.8552	764.92	78	7.9538
284.39	29	2.9572	774.73	79	8.0558
294.20	30	3.0591	784.53	80	8.1577
304.01	31	3.1611	794.34	81	8.2597
313.81	32	3.2631	804.15	82	8.3617
323.62	33	3.3651	813.95	83	8.4636
333.43	34	3.4670	823.76	84	8.5656
343.23	35	3.5690	833.57	85	8.6676
353.04	36	3.6710	843.37	86	8.7696
362.85	37	3.7729	853.18	87	8.8715
372.65	38	3.8749	862.99	88	8.9735
382.46	39	3.9769	872.79	89	9.0755
392.27	40	4.0789	882.60	90	9.1774
402.07	41	4.1808	892.41	91	9.2794
411.88	42	4.2828	902.21	92	9.3814
421.69	43	4.3848	912.02	93	9.4834
431.49	44	4.4868	921.83	94	9.5853
441.30	45	4.5887	931.63	95	9.6873
451.11	46	4.6907	941.44	96	9.7893
460.91	47	4.7927	951.25	97	9.8912
470.72	48	4.8946	961.05	98	9.9932
480.53	49	4.9966	970.86	99	10.095
490.33	50	5.0986	980.07	100	10.197

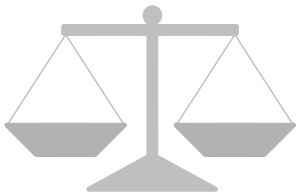
kg	-	*lb*	*kg*	-	*lb*
0.454	1	2.205	23.133	51	112.44
0.907	2	4.409	23.587	52	114.64
1.361	3	6.614	24.040	53	116.84
1.814	4	8.818	24.494	54	119.05
2.268	5	11.023	24.948	55	121.25
2.722	6	13.228	25.401	56	123.46
3.175	7	15.432	25.855	57	125.66
3.629	8	17.637	26.308	58	127.87
4.082	9	19.842	26.762	59	130.07
4.536	10	22.046	27.216	60	132.28
4.990	11	24.251	27.669	61	134.48
5.443	12	26.455	28.123	62	136.69
5.897	13	28.660	28.576	63	138.89
6.350	14	30.865	29.030	64	141.10
6.804	15	33.069	29.484	65	143.30
7.257	16	35.274	29.937	66	145.51
7.711	17	37.479	30.391	67	147.71
8.165	18	39.683	30.844	68	149.91
8.618	19	41.888	31.298	69	152.12
9.072	20	44.092	31.751	70	154.32
9.525	21	46.297	32.205	71	156.53
9.979	22	48.502	32.659	72	158.73
10.433	23	50.706	33.112	73	160.94
10.886	24	52.911	33.566	74	163.14
11.340	25	55.116	34.019	75	165.35
11.793	26	57.320	34.473	76	167.55
12.247	27	59.525	34.927	77	169.76
12.701	28	61.729	35.380	78	171.96
13.154	29	63.934	35.834	79	174.17
13.608	30	66.139	36.287	80	176.37
14.061	31	68.343	36.741	81	178.57
14.515	32	70.548	37.195	82	180.78
14.969	33	72.753	37.648	83	182.98
15.422	34	74.957	38.102	84	185.19
15.876	35	77.162	38.555	85	187.39
16.329	36	79.366	39.009	86	189.60
16.783	37	81.571	39.463	87	191.80
17.237	38	83.776	39.916	88	194.01
17.690	39	85.980	40.370	89	196.21
18.144	40	88.185	40.823	90	198.42
18.597	41	90.390	41.277	91	200.62
19.051	42	92.594	41.730	92	202.83
19.504	43	94.799	42.184	93	205.03
19.958	44	97.003	42.638	94	207.23
20.412	45	99.208	43.091	95	209.44
20.865	46	101.41	43.545	96	211.64
21.319	47	103.62	43.998	97	213.85
21.772	48	105.82	44.452	98	216.05
22.226	49	108.03	44.906	99	218.26
22.680	50	110.23	45.360	100	220.46



CONVERSION TABLE [Inch-mm]

Inch – mm
1" – 10"

		Inches										
Inch		***0***	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***
Fraction	*Decimal*	*mm*										
0	**0**	**0**	**25.4000**	**50.8000**	**76.2000**	**101.6000**	**127.0000**	**152.4000**	**177.8000**	**203.2000**	**228.6000**	**254.0000**
1/64	0.015625	0.3969	25.7969	51.1969	76.5969	101.9969	127.3969	152.7969	178.1969	203.5969	228.9969	254.3969
1/32	0.03125	0.7938	26.1938	51.5938	76.9938	102.3938	127.7938	153.1938	178.5938	203.9938	229.3938	254.7938
3/64	0.046875	1.1906	26.5906	51.9906	77.3906	102.7906	128.1906	153.5906	178.9906	204.3906	229.7906	255.1906
1/16	**0.0625**	**1.5875**	**26.9875**	**52.3875**	**77.7875**	**103.1875**	**128.5875**	**153.9875**	**179.3875**	**204.7875**	**230.1875**	**255.5875**
5/64	0.078125	1.9844	27.3844	52.7844	78.1844	103.5844	128.9844	154.3844	179.7844	205.1844	230.5844	255.9844
3/32	0.09375	2.3812	27.7812	53.1812	78.5812	103.9812	129.3812	154.7812	180.1812	205.5812	230.9812	256.3812
7/64	0.109375	2.7781	28.1781	53.5781	78.9781	104.3781	129.7781	155.1781	180.5781	205.9781	231.3781	256.7781
1/8	**0.125**	**3.1750**	**28.5750**	**53.9750**	**79.3750**	**104.7750**	**130.1750**	**155.5750**	**180.9750**	**206.3750**	**231.7750**	**257.1750**
9/64	0.140625	3.5719	28.9719	54.3719	79.7719	105.1719	130.5719	155.9719	181.3719	206.7719	232.1719	257.5719
5/32	0.15625	3.9688	29.3688	54.7688	80.1688	105.5688	130.9688	156.3688	181.7688	207.1688	232.5688	257.9688
11/64	0.171875	4.3656	29.7656	55.1656	80.5656	105.9656	131.3656	156.7656	182.1656	207.5656	232.9656	258.3656
3/16	**0.1875**	**4.7625**	**30.1625**	**55.5625**	**80.9625**	**106.3625**	**131.7625**	**157.1625**	**182.5625**	**207.9625**	**233.3625**	**258.7625**
13/64	0.203125	5.1594	30.5594	55.9594	81.3594	106.7594	132.1594	157.5594	182.9594	208.3594	233.7594	259.1594
7/32	0.21875	5.5562	30.9562	56.3562	81.7562	107.1562	132.5562	157.9562	183.3562	208.7562	234.1562	259.5562
15/64	0.234375	5.9531	31.3531	56.7531	82.1531	107.5531	132.9531	158.3531	183.7531	209.1531	234.5531	259.9531
1/4	**0.25**	**6.3500**	**31.7500**	**57.1500**	**82.5500**	**107.9500**	**133.3500**	**158.7500**	**184.1500**	**209.5500**	**234.9500**	**260.3500**
17/64	0.265625	6.7469	32.1469	57.5469	82.9469	108.3469	133.7469	159.1469	184.5469	209.9469	235.3469	260.7469
9/32	0.28125	7.1438	32.5438	57.9438	83.3438	108.7438	134.1438	159.5438	184.9438	210.3438	235.7438	261.1438
19/64	0.296875	7.5406	32.9406	58.3406	83.7406	109.1406	134.5406	159.9406	185.3406	210.7406	236.1406	261.5406
5/16	**0.3125**	**7.9375**	**33.3375**	**58.7375**	**84.1375**	**109.5375**	**134.9375**	**160.3375**	**185.7375**	**211.1375**	**236.5375**	**261.9375**
21/64	0.328125	8.3344	33.7344	59.1344	84.5344	109.9344	135.3344	160.7344	186.1344	211.5344	236.9344	262.3344
11/32	0.34375	8.7312	34.1312	59.5312	84.9312	110.3312	135.7312	161.1312	186.5312	211.9312	237.3312	262.7312
23/64	0.359375	9.1281	34.5281	59.9281	85.3281	110.7281	136.1281	161.5281	186.9281	212.3281	237.7281	263.1281
3/8	**0.375**	**9.5250**	**34.9250**	**60.3250**	**85.7250**	**111.1250**	**136.5250**	**161.9250**	**187.3250**	**212.7250**	**238.1250**	**263.5250**
25/64	0.390625	9.9219	35.3219	60.7219	86.1219	111.5219	136.9219	162.3219	187.7219	213.1219	238.5219	263.9219
13/32	0.40625	10.3188	35.7188	61.1188	86.5188	111.9188	137.3188	162.7188	188.1188	213.5188	238.9188	264.3188
27/64	0.421875	10.7156	36.1156	61.5156	86.9156	112.3156	137.7156	163.1156	188.5156	213.9156	239.3156	264.7156
7/16	**0.4375**	**11.1125**	**36.5125**	**61.9125**	**87.3125**	**112.7125**	**138.1125**	**163.5125**	**188.9125**	**214.3125**	**239.7125**	**265.1125**
29/64	0.453125	11.5094	36.9094	62.3094	87.7094	113.1094	138.5094	163.9094	189.3094	214.7094	240.1094	265.5094
15/32	0.46875	11.9062	37.3062	62.7062	88.1062	113.5062	138.9062	164.3062	189.7062	215.1062	240.5062	265.9062
31/64	0.484375	12.3031	37.7031	63.1031	88.5031	113.9031	139.3031	164.7031	190.1031	215.5031	240.9031	266.3031
1/2	**0.5**	**12.7000**	**38.1000**	**63.5000**	**88.9000**	**114.3000**	**139.7000**	**165.1000**	**190.5000**	**215.9000**	**241.3000**	**266.7000**
33/64	0.515625	13.0969	38.4969	63.8969	89.2969	114.6969	140.0969	165.4969	190.8969	216.2969	241.6969	267.0969
17/32	0.53125	13.4938	38.8938	64.2938	89.6938	115.0938	140.4938	165.8938	191.2938	216.6938	242.0938	267.4938
35/64	0.546875	13.8906	39.2906	64.6906	90.0906	115.4906	140.8906	166.2906	191.6906	217.0906	242.4906	267.8906
9/16	**0.5625**	**14.2875**	**39.6875**	**65.0875**	**90.4875**	**115.8875**	**141.2875**	**166.6875**	**192.0875**	**217.4875**	**242.8875**	**268.2875**
37/64	0.578125	14.6844	40.0844	65.4844	90.8844	116.2844	141.6844	167.0844	192.4844	217.8844	243.2844	268.6844
19/32	0.59375	15.0812	40.4812	65.8812	91.2812	116.6812	142.0812	167.4812	192.8812	218.2812	243.6812	269.0812
39/64	0.609375	15.4781	40.8781	66.2781	91.6781	117.0781	142.4781	167.8781	193.2781	218.6781	244.0781	269.4781
5/8	**0.625**	**15.8750**	**41.2750**	**66.6750**	**92.0750**	**117.4750**	**142.8750**	**168.2750**	**193.6750**	**219.0750**	**244.4750**	**269.8750**
41/64	0.640625	16.2719	41.6719	67.0719	92.4719	117.8719	143.2719	168.6719	194.0719	219.4719	244.8719	270.2719
21/32	0.65625	16.6688	42.0688	67.4688	92.8688	118.2688	143.6688	169.0688	194.4688	219.8688	245.2688	270.6688
43/64	0.671875	17.0656	42.4656	67.8656	93.2656	118.6656	144.0656	169.4656	194.8656	220.2656	245.6656	271.0656
11/16	**0.6875**	**17.4625**	**42.8625**	**68.2625**	**93.6625**	**119.0625**	**144.4625**	**169.8625**	**195.2625**	**220.6625**	**246.0625**	**271.4625**
45/64	0.703125	17.8594	43.2594	68.6594	94.0594	119.4594	144.8594	170.2594	195.6594	221.0594	246.4594	271.8594
23/32	0.71875	18.2562	43.6562	69.0562	94.4562	119.8562	145.2562	170.6562	196.0562	221.4562	246.8562	272.2562
47/64	0.734375	18.6531	44.0531	69.4531	94.8531	120.2531	145.6531	171.0531	196.4531	221.8531	247.2531	272.6531
3/4	**0.75**	**19.0500**	**44.4500**	**69.8500**	**95.2500**	**120.6500**	**146.0500**	**171.4500**	**196.8500**	**222.2500**	**247.6500**	**273.0500**
49/64	0.765625	19.4469	44.8469	70.2469	95.6469	121.0469	146.4469	171.8469	197.2469	222.6469	248.0469	273.4469
25/32	0.78125	19.8438	45.2438	70.6438	96.0438	121.4438	146.8438	172.2438	197.6438	223.0438	248.4438	273.8438
51/64	0.796875	20.2406	45.6406	71.0406	96.4406	121.8406	147.2406	172.6406	198.0406	223.4406	248.8406	274.2406
13/16	**0.8125**	**20.6375**	**46.0375**	**71.4375**	**96.8375**	**122.2375**	**147.6375**	**173.0375**	**198.4375**	**223.8375**	**249.2375**	**274.6375**
53/64	0.828125	21.0344	46.4344	71.8344	97.2344	122.6344	148.0344	173.4344	198.8344	224.2344	249.6344	275.0344
27/32	0.84375	21.4312	46.8312	72.2312	97.6312	123.0312	148.4312	173.8312	199.2312	224.6312	250.0312	275.4312
55/64	0.859375	21.8281	47.2281	72.6281	98.0281	123.4281	148.8281	174.2281	199.6281	225.0281	250.4281	275.8281
7/8	**0.875**	**22.2250**	**47.6250**	**73.0250**	**98.4250**	**123.8250**	**149.2250**	**174.6250**	**200.0250**	**225.4250**	**250.8250**	**276.2250**
57/64	0.890625	22.6219	48.0219	73.4219	98.8219	124.2219	149.6219	175.0219	200.4219	225.8219	251.2219	276.6219
29/32	0.90625	23.0188	48.4188	73.8188	99.2188	124.6188	150.0188	175.4188	200.8188	226.2188	251.6188	277.0188
59/64	0.921875	23.4156	48.8156	74.2156	99.6156	125.0156	150.4156	175.8156	201.2156	226.6156	252.0156	277.4156
15/16	**0.9375**	**23.8125**	**49.2125**	**74.6125**	**100.0125**	**125.4125**	**150.8125**	**176.2125**	**201.6125**	**227.0125**	**252.4125**	**277.8125**
61/64	0.953125	24.2094	49.6094	75.0094	100.4094	125.8094	151.2094	176.6094	202.0094	227.4094	252.8094	278.2094
31/32	0.96875	24.6062	50.0062	75.4062	100.8062	126.2062	151.6062	177.0062	202.4062	227.8062	253.2062	278.6062
63/64	0.984375	25.0031	50.4031	75.8031	101.2031	126.6031	152.0031	177.4031	202.8031	228.2031	253.6031	279.0031



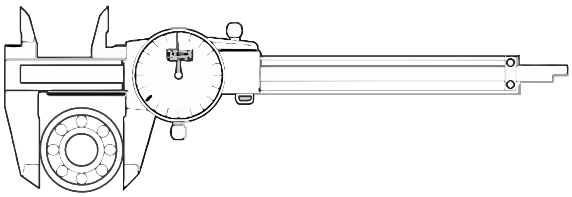
CONVERSION TABLE

Inch – mm
1" – 40"

Inch		Inches 11	12	13	14	15	16	17	18	19	20
Fraction	Decimal	mm									
0	**0.0000**	**279.400**	**304.800**	**330.200**	**355.600**	**381.000**	**406.400**	**431.800**	**457.200**	**482.600**	**508.000**
1 / 16	0.0625	280.988	306.388	331.788	357.188	382.588	407.988	433.388	458.788	484.188	509.588
1 / 8	0.1250	282.575	307.975	333.375	358.775	384.175	409.575	434.975	460.375	485.775	511.175
3 / 16	0.1875	284.162	309.562	334.962	360.362	385.762	411.162	436.562	461.962	487.362	512.762
1 / 4	**0.2500**	**285.750**	**311.150**	**336.550**	**361.950**	**387.350**	**412.750**	**438.150**	**463.550**	**488.950**	**514.350**
5 / 16	0.3125	287.338	312.738	338.138	363.538	388.938	414.338	439.738	465.138	490.538	515.938
3 / 8	0.3750	288.925	314.325	339.725	365.125	390.525	415.925	441.325	466.725	492.125	517.525
7 / 16	0.4375	290.512	315.912	341.312	366.712	392.112	417.512	442.912	468.312	493.712	519.112
1 / 2	**0.5000**	**292.100**	**317.500**	**342.900**	**368.300**	**393.700**	**419.100**	**444.500**	**469.900**	**495.300**	**520.700**
9 / 16	0.5625	293.688	319.088	344.488	369.888	395.288	420.688	446.088	471.488	496.888	522.288
5 / 8	0.6250	295.275	320.675	346.075	371.475	396.875	422.275	447.675	473.075	498.475	523.875
11 / 16	0.6875	296.862	322.262	347.662	373.062	398.462	423.862	449.262	474.662	500.062	525.462
3 / 4	**0.7500**	**298.450**	**323.850**	**349.250**	**374.650**	**400.050**	**425.450**	**450.850**	**476.250**	**501.650**	**527.050**
13 / 16	0.8125	300.038	325.438	350.838	376.238	401.638	427.038	452.438	477.838	503.238	528.638
7 / 8	0.8750	301.625	327.025	352.425	377.825	403.225	428.625	454.025	479.425	504.825	530.225
15 / 16	0.9375	303.212	328.612	354.012	379.412	404.812	430.212	455.612	481.012	506.412	531.812

Inch		Inches 21	22	23	24	25	26	27	28	29	30
Fraction	Decimal	mm									
0	**0.0000**	**533.400**	**558.800**	**584.200**	**609.600**	**635.000**	**660.400**	**685.800**	**711.200**	**736.600**	**762.000**
1 / 16	0.0625	534.988	560.388	585.788	611.188	636.588	661.988	687.388	712.788	738.188	763.588
1 / 8	0.1250	536.575	561.975	587.375	612.775	638.175	663.575	688.975	714.375	739.775	765.175
3 / 16	0.1875	538.162	563.562	588.962	614.362	639.762	665.162	690.562	715.962	741.362	766.762
1 / 4	**0.2500**	**539.750**	**565.150**	**590.550**	**615.950**	**641.350**	**666.750**	**692.150**	**717.550**	**742.950**	**768.350**
5 / 16	0.3125	541.338	566.738	592.138	617.538	642.938	668.338	693.738	719.138	744.538	769.938
3 / 8	0.3750	542.925	568.325	593.725	619.125	644.525	669.925	695.325	720.725	746.125	771.525
7 / 16	0.4375	544.512	569.912	595.312	620.712	646.112	671.512	696.912	722.312	747.712	773.112
1 / 2	**0.5000**	**546.100**	**571.500**	**596.900**	**622.300**	**647.700**	**673.100**	**698.500**	**723.900**	**749.300**	**774.700**
9 / 16	0.5625	547.688	573.088	598.488	623.888	649.288	674.688	700.088	725.488	750.888	776.288
5 / 8	0.6250	549.275	574.675	600.075	625.475	650.875	676.275	701.675	727.075	752.475	777.875
11 / 16	0.6875	550.862	576.262	601.662	627.062	652.462	677.862	703.262	728.662	754.062	779.462
3 / 4	**0.7500**	**552.450**	**577.850**	**603.250**	**628.650**	**654.050**	**679.450**	**704.850**	**730.250**	**755.650**	**781.050**
13 / 16	0.8125	554.038	579.438	604.838	630.238	655.638	681.038	706.438	731.838	757.238	782.638
7 / 8	0.8750	555.625	581.025	606.425	631.825	657.225	682.625	708.025	733.425	758.825	784.225
15 / 16	0.9375	557.212	582.612	608.012	633.412	658.812	684.212	709.612	735.012	760.412	785.812

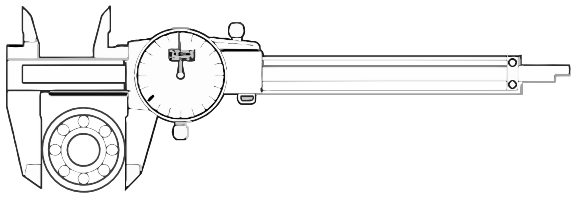
Inch		Inches 31	32	33	34	35	36	37	38	39	40
Fraction	Decimal	mm									
0	**0.0000**	**787.400**	**812.800**	**838.200**	**863.600**	**889.000**	**914.400**	**939.800**	**965.200**	**990.600**	**1016.000**
1 / 16	0.0625	788.988	814.388	839.788	865.188	890.588	915.988	941.388	966.788	992.188	1017.588
1 / 8	0.1250	790.575	815.975	841.375	866.775	892.175	917.575	942.975	968.375	993.775	1019.175
3 / 16	0.1875	792.162	817.562	842.962	868.362	893.762	919.162	944.562	969.962	995.362	1020.762
1 / 4	**0.2500**	**793.750**	**819.150**	**844.550**	**869.950**	**895.350**	**920.750**	**946.150**	**971.550**	**996.950**	**1022.350**
5 / 16	0.3125	795.338	820.738	846.138	871.538	896.938	922.338	947.738	973.138	998.538	1023.938
3 / 8	0.3750	796.925	822.325	847.725	873.125	898.525	923.925	949.325	974.725	1000.125	1025.525
7 / 16	0.4375	798.512	823.912	849.312	874.712	900.112	925.512	950.912	976.312	1001.712	1027.112
1 / 2	**0.5000**	**800.100**	**825.500**	**850.900**	**876.300**	**901.700**	**927.100**	**952.500**	**977.900**	**1003.300**	**1028.700**
9 / 16	0.5625	801.688	827.088	852.488	877.888	903.288	928.688	954.088	979.488	1004.888	1030.288
5 / 8	0.6250	803.275	828.675	854.075	879.475	904.875	930.275	955.675	981.075	1006.475	1031.875
11 / 16	0.6875	804.862	830.262	855.662	881.062	906.462	931.862	957.262	982.662	1008.062	1033.462
3 / 4	**0.7500**	**806.450**	**831.850**	**857.250**	**882.650**	**908.050**	**933.450**	**958.850**	**984.250**	**1009.650**	**1035.050**
13 / 16	0.8125	808.038	833.438	858.838	884.238	909.638	935.038	960.438	985.838	1011.238	1036.638
7 / 8	0.8750	809.625	835.025	860.425	885.825	911.225	936.625	962.025	987.425	1012.825	1038.225
15 / 16	0.9375	811.212	836.612	862.012	887.412	912.812	938.212	963.621	989.012	1014.412	1039.812



TOLERANCE TABLES
Tolerances for Shaft Diameters

units : μm

Diameter (mm)		Δ_{dmp}	***d6***	***e6***	***f6***	***g5***	***g6***	***h5***	***h6***	***h7***	***h8***	***h9***	***h10***	***js5***	***js6***	***j5***	***j6***	***j7***	***k5***	***k6***	***k7***	***m5***	***m6***	***n6***	***p6***
over	*incl*																								
3	6	0	-30	-20	-10	-4	-4	0	0	0	0	0	0	± 2.5	± 4.0	+ 3	+ 6	+ 8	+ 6	+ 9	+ 13	+ 9	+ 12	+ 16	+ 20
		-8	-38	-28	-18	-9	-12	-5	-8	-12	-18	-30	-48			-2	-2	-4	+ 1	+ 1	+ 1	+ 4	+ 4	+ 8	+ 12
6	10	0	-40	-25	-13	-5	-5	0	0	0	0	0	0	± 3.0	± 4.5	+ 4	+ 7	+ 10	+ 7	+ 10	+ 16	+ 12	+ 15	+ 19	+ 24
		-8	-49	-34	-22	-11	-14	-6	-9	-15	-22	-36	-58			-2	-2	-5	+ 1	+ 1	+ 1	+ 6	+ 6	+ 10	+ 15
10	18	0	-50	-32	-16	-6	-6	0	0	0	0	0	0	± 4.0	± 5.5	+ 5	+ 8	+ 12	+ 9	+ 12	+ 19	+ 15	+ 18	+ 23	+ 29
		-8	-61	-43	-27	-14	-17	-8	-11	-18	-27	-43	-70			-3	-3	-6	+ 1	+ 1	+ 1	+ 7	+ 7	+ 12	+ 18
18	30	0	-65	-40	-20	-7	-7	0	0	0	0	0	0	± 4.5	± 6.5	+ 5	+ 9	+ 13	+ 11	+ 15	+ 23	+ 17	+ 21	+ 28	+ 35
		-10	-78	-53	-33	-16	-20	-9	-13	-21	-33	-52	-84			-4	-4	-8	+ 2	+ 2	+ 2	+ 8	+ 8	+ 15	+ 22
30	50	0	-80	-50	-25	-9	-9	0	0	0	0	0	0	± 5.5	± 8.0	+ 6	+ 11	+ 15	+ 13	+ 18	+ 27	+ 20	+ 25	+ 33	+ 42
		-12	-96	-66	-41	-20	-25	-11	-16	-25	-39	-62	-100			-5	-5	-10	+ 2	+ 2	+ 2	+ 9	+ 9	+ 17	+ 26
50	80	0	-100	-60	-30	-10	-10	0	0	0	0	0	0	± 6.5	± 9.5	+ 6	+ 12	+ 18	+ 15	+ 21	+ 32	+ 24	+ 30	+ 39	+ 51
		-15	-119	-79	-49	-23	-29	-13	-19	-30	-46	-74	-120			-7	-7	-12	+ 2	+ 2	+ 2	+ 11	+ 11	+ 20	+ 32
80	120	0	-120	-72	-36	-12	-12	0	0	0	0	0	0	± 7.5	± 11.0	+ 6	+ 13	+ 20	+ 18	+ 25	+ 38	+ 28	+ 35	+ 45	+ 59
		-20	-142	-94	-58	-27	-34	-15	-22	-35	-54	-87	-140			-9	-9	-15	+ 3	+ 3	+ 3	+ 13	+ 13	+ 23	+ 37
120	180	0	-145	-85	-43	-14	-14	0	0	0	0	0	0	± 9.0	± 12.5	+ 7	+ 14	+ 22	+ 21	+ 28	+ 43	+ 33	+ 40	+ 52	+ 68
		-25	-170	-110	-68	-32	-39	-18	-25	-40	-63	-100	-160			-11	-11	-18	+ 3	+ 3	+ 3	+ 15	+ 15	+ 27	+ 43
180	250	0	-170	-100	-50	-15	-15	0	0	0	0	0	0	± 10.0	± 14.5	+ 7	+ 16	+ 25	+ 24	+ 33	+ 50	+ 37	+ 46	+ 60	+ 79
		-30	-199	-129	-79	-35	-44	-20	-29	-46	-72	-115	-185			-13	-13	-21	+ 4	+ 4	+ 4	+ 17	+ 17	+ 31	+ 50
250	315	0	-190	-110	-56	-17	-17	0	0	0	0	0	0	± 11.5	± 16.0	+ 7	± 16	± 26	+ 27	+ 36	+ 56	+ 43	+ 52	+ 66	+ 88
		-35	-222	-142	-88	-40	-49	-23	-32	-52	-81	-130	-210			-16			+ 4	+ 4	+ 4	+ 20	+ 20	+ 34	+ 56
315	400	0	-210	-125	-62	-18	-18	0	0	0	0	0	0	± 12.5	± 18.0	+ 7	± 18	+ 29	+ 29	+ 40	+ 61	+ 46	+ 57	+ 73	+ 98
		-40	-246	-161	-98	-43	-54	-25	-36	-57	-89	-140	-230			-18		-28	+ 4	+ 4	+ 4	+ 21	+ 21	+ 37	+ 62
400	500	0	-230	-135	-68	-20	-20	0	0	0	0	0	0	± 13.5	± 20.0	+ 7	± 20	+ 31	+ 32	+ 45	+ 68	+ 50	+ 63	+ 80	+ 108
		-45	-270	-175	-108	-47	-60	-27	-40	-63	-97	-155	-250			-20		-32	+ 5	+ 5	+ 5	+ 23	+ 23	+ 40	+ 68
500	630	0	-260	-145	-76	-	-22	-	0	0	0	0	0	-	± 22.0	-	-	-	-	+ 44	+ 70	-	+ 70	+ 88	+ 122
		-50	-304	-189	-120		-66		-44	-70	-110	-175	-280							0	0		+ 26	+ 44	+ 78
630	800	0	-290	-160	-80	-	-24	-	0	0	0	0	0	-	± 25.0	-	-	-	-	+ 50	+ 80	-	+ 80	+ 100	+ 138
		-75	-340	-210	-130		-74		-50	-80	-125	-200	-320							0	0		+ 30	+ 50	+ 88
800	1000	0	-320	-170	-86	-	-26	-	0	0	0	0	0	-	± 28.0	-	-	-	-	+ 56	+ 90	-	+ 90	+ 112	+ 156
		-100	-376	-226	-142		-82		-56	-90	-140	-230	-360							0	0		+ 34	+ 56	+ 100
1000	1250	0	-350	-195	-98	-	-28	-	0	0	0	0	0	-	± 33.0	-	-	-	-	+ 66	+ 105	-	+ 106	+ 132	+ 186
		-125	-416	-261	-164		-94		-66	-105	-165	-260	-420							0	0		+ 40	+ 66	+ 120
1250	1600	0	-390	-220	-110	-	-30	-	0	0	0	0	0	-	± 39.0	-	-	-	-	+ 78	+ 125	-	+ 126	+ 156	+ 218
		-160	-468	-298	-188		-108		-78	-125	-195	-310	-500							0	0		+ 48	+ 78	+ 140
1600	2000	0	-430	-240	-120	-	-32	-	0	0	0	0	0	-	± 46.0	-	-	-	-	+ 92	+ 150	-	+ 150	+ 184	+ 262
		-200	-522	-332	-212		-124		-92	-150	-230	-370	-600							0	0		+ 58	+ 92	+ 170



TOLERANCE TABLES
Tolerances for Housing Bore Diameters

units : μm

Diameters (mm)		Δ_{Dmp}	*E6*	*F6*	*F7*	*G6*	*G7*	*H6*	*H7*	*H8*	*J6*	*J7*	*JS6*	*JS7*	*K5*	*K6*	*K7*	*M5*	*M6*	*M7*	*N5*	*N6*	*N7*	*P6*	*P7*
over	*incl*																								
10	18	0	+ 43	+ 27	+ 34	+ 17	+ 24	+ 11	+ 18	+ 27	+ 6	+ 10	± 5.5	± 9	+ 2	+ 2	+ 6	-4	-4	0	-9	-9	-5	-15	-11
		-8	+ 32	+ 16	+ 16	+ 6	+ 6	0	0	0	-5	-8			-6	-9	-12	-12	-15	-18	-17	-20	-23	-26	-29
18	30	0	+ 53	+ 33	+ 41	+ 20	+ 28	+ 13	+ 21	+ 33	+ 8	+ 12	± 6.5	± 10.5	+ 1	+ 2	+ 6	-5	-4	0	-12	-11	-7	-18	-14
		-9	+ 40	+ 20	+ 20	+ 7	+ 7	0	0	0	-5	-9			-8	-11	-15	-14	-17	-21	-21	-24	-28	-31	-35
30	50	0	+ 66	+ 41	+ 50	+ 25	+ 34	+ 16	+ 25	+ 39	+ 10	+ 14	± 8	± 12.5	+ 2	+ 3	+ 7	-5	-4	0	-13	-12	-8	-21	-17
		-11	+ 50	+ 25	+ 25	+ 9	+ 9	0	0	0	-6	-11			-9	-13	-18	-16	-20	-25	-24	-28	-33	-37	-42
50	80	0	+ 79	+ 49	+ 60	+ 29	+ 40	+ 19	+ 30	+ 46	+ 13	+ 18	± 9.5	± 15	+ 3	+ 4	+ 9	-6	-5	0	-15	-14	-9	-26	-21
		-13	+ 60	+ 30	+ 30	+ 10	+ 10	0	0	0	-6	-12			-10	-15	-21	-19	-24	-30	-28	-33	-39	-45	-51
80	120	0	+ 94	+ 58	+ 71	+ 34	+ 47	+ 22	+ 35	+ 54	+ 16	+ 22	± 11	± 17.5	+ 2	+ 4	+ 10	-8	-6	0	-18	-16	-10	-30	-24
		-15	+ 72	+ 36	+ 36	+ 12	+ 12	0	0	0	-6	-13			-13	-18	-25	-23	-28	-35	-33	-38	-45	-52	-59
120	150	0	+ 110	+ 68	+ 83	+ 39	+ 54	+ 25	+ 40	+ 63	+ 18	+ 26	± 12.5	± 20	+ 3	+ 4	+ 12	-9	-8	0	-21	-20	-12	-36	-28
		-18	+ 85	+ 43	+ 43	+ 14	+ 14	0	0	0	-7	-14			-15	-21	-28	-27	-33	-40	-39	-45	-52	-61	-68
150	180	0	+ 110	+ 68	+ 83	+ 39	+ 54	+ 25	+ 40	+ 63	+ 18	+ 26	± 12.5	± 20	+ 3	+ 4	+ 12	-9	-8	0	-21	-20	-12	-36	-28
		-25	+ 85	+ 43	+ 43	+ 14	+ 14	0	0	0	-7	-14			-15	-21	-28	-27	-33	-40	-39	-45	-52	-61	-68
180	250	0	+ 129	+ 79	+ 96	+ 44	+ 61	+ 29	+ 46	+ 72	+ 22	+ 30	± 14.5	± 23	+ 2	+ 5	+ 13	-11	-8	0	-25	-22	-14	-41	-33
		-30	+ 100	+ 50	+ 50	+ 15	+ 15	0	0	0	-7	-16			-18	-24	-33	-31	-37	-46	-45	-51	-60	-70	-79
250	315	0	+ 142	+ 88	+ 108	+ 49	+ 69	+ 32	+ 52	+ 81	+ 25	+ 36	± 16	± 26	+ 3	+ 5	+ 16	-13	-9	0	-27	-25	-14	-47	-36
		-35	+ 110	+ 56	+ 56	+ 17	+ 17	0	0	0	-7	-16			-20	-27	-36	-36	-41	-52	-50	-57	-66	-79	-88
315	400	0	+ 161	+ 98	+ 119	+ 54	+ 75	+ 36	+ 57	+ 89	+ 29	+ 39	± 18	± 28.5	+ 3	+ 7	+ 17	-14	-10	0	-30	-26	-16	-51	-41
		-40	+ 125	+ 62	+ 62	+ 18	+ 18	0	0	0	-7	-18			-22	-29	-40	-39	-46	-57	-55	-62	-73	-87	-98
400	500	0	+ 175	+ 108	+ 131	+ 60	+ 83	+ 40	+ 63	+ 97	+ 33	+ 43	± 20	± 31.5	+ 2	+ 8	+ 18	-16	-10	0	-33	-27	-17	-55	-45
		-45	+ 135	+ 68	+ 68	+ 20	+ 20	0	0	0	-7	-20			-25	-32	-45	-43	-50	-63	-60	-67	-80	-95	-108
500	630	0	+ 189	+ 120	+ 146	+ 66	+ 92	+ 44	+ 70	+ 110	-	-	± 22	± 35	-	0	0	-	-26	-26	-	-44	-44	-78	-78
		-50	+ 145	+ 76	+ 76	+ 22	+ 22	0	0	0						-44	-70		-70	-96		-88	-114	-122	-148
630	800	0	+ 210	+ 130	+ 160	+ 74	+ 104	+ 50	+ 80	+ 125	-	-	± 25	± 40	-	0	0	-	-30	-30	-	-50	-50	-88	-88
		-75	+ 160	+ 80	+ 80	+ 24	+ 24	0	0	0						-50	-80		-80	-110		-100	-130	-138	-168
800	1000	0	+ 226	+ 142	+ 176	+ 82	+ 116	+ 56	+ 90	+ 140	-	-	± 28	± 45	-	0	0	-	-34	-34	-	-56	-56	-100	-100
		-100	+ 170	+ 86	+ 86	+ 26	+ 26	0	0	0						-56	-90		-90	-124		-112	-146	-156	-190
1000	1250	0	+ 261	+ 164	+ 203	+ 94	+ 133	+ 66	+ 105	+ 165	-	-	± 33	± 52.5	-	0	0	-	-40	-40	-	-66	-66	-120	-120
		-125	+ 195	+ 98	+ 98	+ 28	+ 28	0	0	0						-66	-105		-106	-145		-132	-171	-186	-225
1250	1600	0	+ 298	+ 188	+ 235	+ 108	+ 155	+ 78	+ 125	+ 195	-	-	± 39	± 62.5	-	0	0	-	-48	-48	-	-78	-78	-140	-140
		-160	+ 220	+ 110	+ 110	+ 30	+ 30	0	0	0						-78	-125		-126	-173		-156	-203	-218	-265
1600	2000	0	+ 332	+ 212	+ 270	+ 124	+ 182	+ 92	+ 150	+ 230	-	-	± 46	± 75	-	0	0	-	-58	-58	-	-92	-92	-170	-170
		-200	+ 240	+ 120	+ 120	+ 32	+ 32	0	0	0						-92	-150		-150	-208		-184	-242	-262	-320
2000	2500	0	+ 370	+ 240	+ 305	+ 144	+ 209	+ 110	+ 175	+ 280	-	-	± 55	± 87.5	-	0	0	-	-68	-68	-	-110	-110	-195	-195
		-250	+ 260	+ 130	+ 130	+ 34	+ 34	0	0	0						-110	-175		-178	-243		-220	-285	-305	-370

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