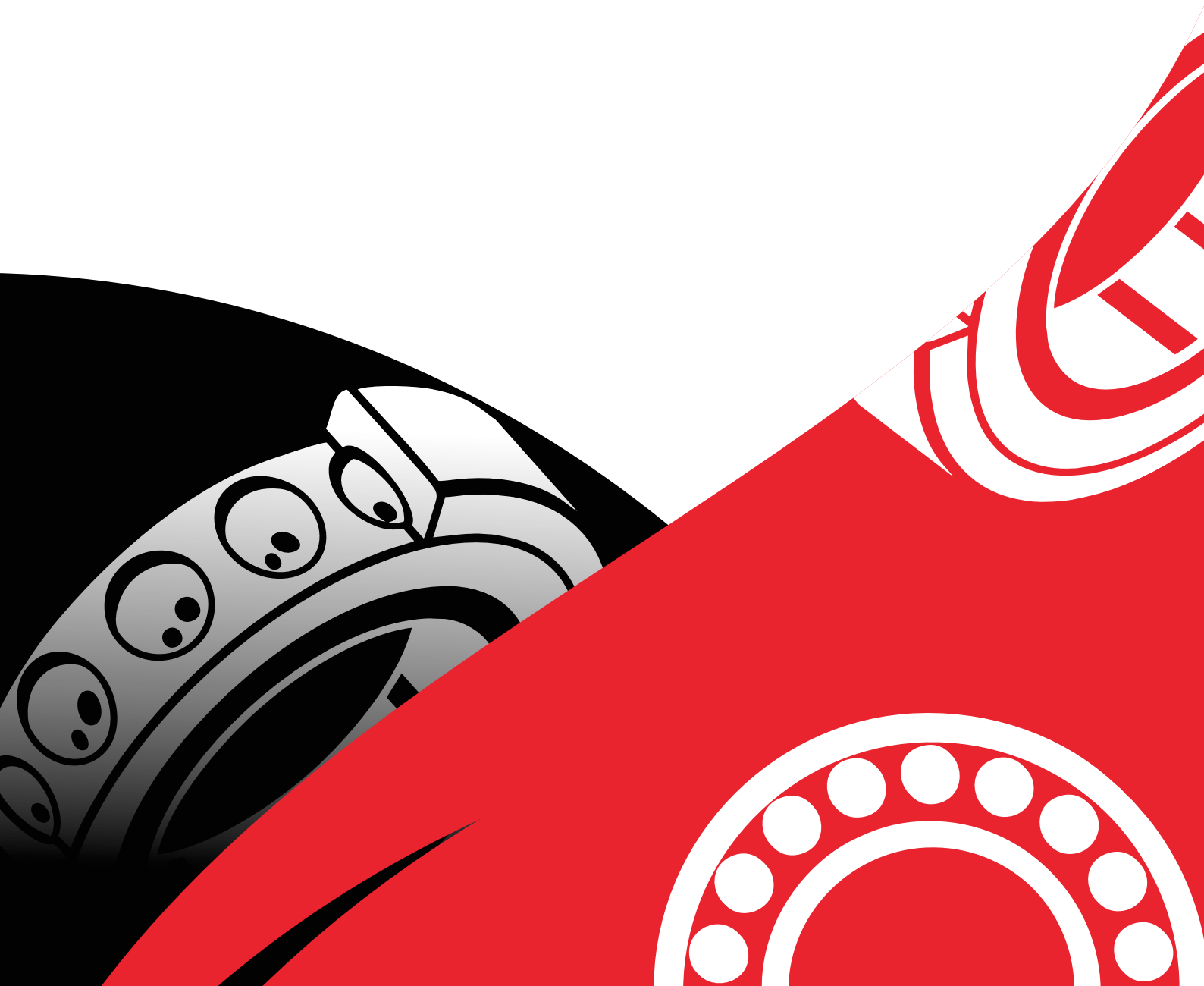
BMT Impex

Your Motion's Perfect Partner

SMOOTH | STRONG | SUPERIOR.



About Us

At Bmt Impex, We Believe That Even The Smallest Components Can Make The Biggest Difference. That's Why We've Dedicated Ourselves To Supplying A Full Spectrum Of High Performance Bearings For Industries That Demand Consistency, Durability, & Excellence.

From Miniature Bearings For Precision Instruments To Large Scale Components For Heavy Duty Applications, Our Catalogue Is Designed To Meet The Needs Of Every Customer-From Local Repair Shops To Multinational Manufacturers.

Who We Are

We're more than just a bearing supplier—we're a solutions partner. Built on a foundation of engineering knowledge and a passion for excellence, our team brings together years of experience & a customer-first mind set.

Whether you're sourcing for daily operations or a specialized project, we're here to support your goals with the right products & technical guidance.

What We offer

Extensive Product Range: One of the most diverse selections in the industry, ensuring you find the right bearing for any application. Quality Assurance: All bearings meet or exceed international standards, including ISO, DIN, & ANSI.

- In-stock inventory for fast fulfillment and minimal downtime
- Expert support for product selection, compatibility, & application requirements.

Our Commitment

We understand that our bearings often become part of something much larger—machines that power progress, vehicles that connect people, equipment that feeds the world. That's why every product we offer is backed by rigorous quality control & a commitment to performance.

Serving Industries Around the World

Our bearings can be found across:

- Automotive
- Industrial Manufacturing
- Agricultural Equipment
- Renewable Energy

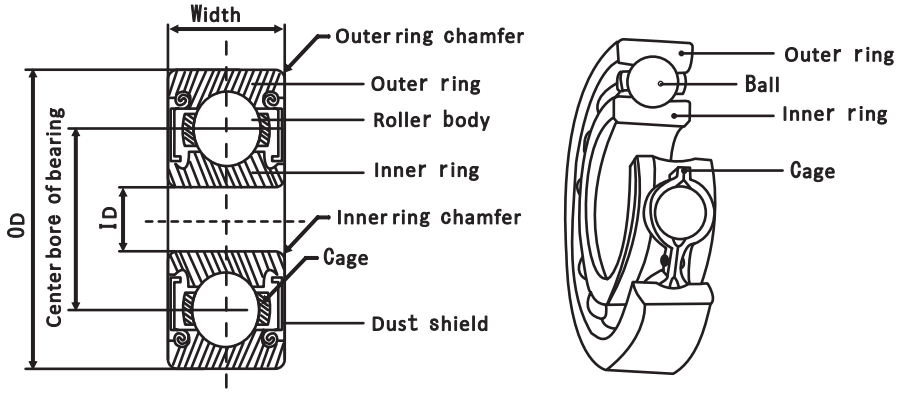
Medical device/ instrument Construction equipment

Home Appliances

Let's Move Forward, Together At BMT Impex , we're proud to keep industry moving—one bearing at a time. Browse our catalogue, get in touch with our team, and discover how we can help you build better, run smoother, & perform stronger.

1. Structure & Parts of Bearings

1.1 Deep groove ball bearings



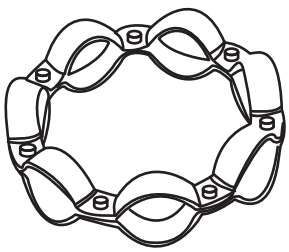
Structure of deep groove ball bearing basically includes inner ring, outer ring, roller elements and cages. Seal rings and dust shields are designed to prevent foreign matters like dust or oils from entering. The main purpose of lubricant used is to achieve the reduction of friction and damage of roller elements.

Cage

In daily operations, cage will be subjected not only to mechanical action from friction, tension and inertial force, but to chemical reaction from lubricants, additives, solvents or coolants. Therefore, design and materials of cage are very important for its performance and the reliability of bearing in usage.

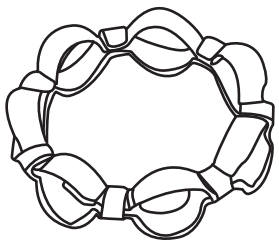
BMTV2. WBT offers the following kinds of cage for deep groove ball bearings:

Rivet type cage



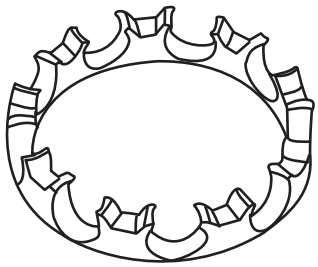
It is a kind of cage made by strip steels in high precision, turned into spherical pockets through profiling and fixed with rivets, usually applied to small and medium deep groove ball bearings.

Crank jaw type cage



It is a kind of cage made by strip steels in high precision, turned into spherical pockets through profiling and caulked by crank jaw and two pairs of retainers, usually used for miniature deep groove ball bearings.

Cage with synthetic resin material



Synthetic resin cage is made by combination of several materials, including nylon PA66 with glass fiber. It has self-lubricating and low noise features, usually used for bearings with extremely low noise

Inner ring structure

BMTV2 & WBT bearings have the following inner ring structures:

V-groove structure

L-groove structure

Flat top structure

Dust shield & seal ring

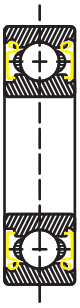
Sealing performance plays an important role in the cleanliness of lubricant and bearing life. Intrusion of foreign matters and leakage of lubricant must be prohibited for internal sealing structure of bearing. In case that bearing external is unable to be sealed, bearings with sealing structure will be generally applied

Sealing forms corresponding to different inner ring structures

V-groove series

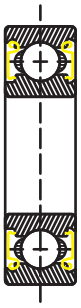
Steel sheet dust shield(ZZ)

Steel dust shield is suitable for occasions with better external environment; Applicable to high speed operation occasions;



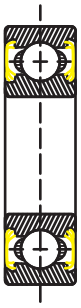
Rubber seal ring, non-contact (2RZ)

Sealing performance is on average level, applicable to occasions with better external environment; Applicable to occasions with higher starting torque



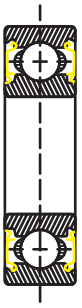
Double contact (2RS)

Sealing performance is good, applicable to occasions where the external environment is very severe; High initial torque, applicable to occasions with general rotational speed;



Single contact (2RW)

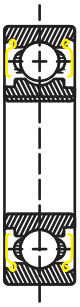
Sealing performance is the best, applicable to occasions where there is higher requirement for sealing performance; Lower initial torque, applicable to occasions with higher rotational speed;



L-groove series

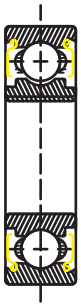
Steel sheet dust shield (ZZ)

Steel dust shield is used for occasions with better external environment; Applicable to high speed operation occasions;



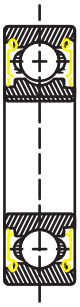
Rubber seal ring, non-contact (2RZ)

Sealing performance is with average level, applicable to occasions with better external environment; Applicable to occasions with higher rotational speed;



Rubber seal ring, contact type (2RS)

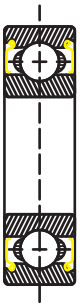
Sealing performance is good, applicable to occasions where there is higher requirement for external environment; Normal initial torque, especially applicable to occasions with general rotational speed;



Flat head series

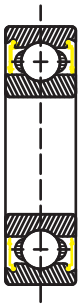
Steel sheet dust shield (ZZ)

Steel dust shield is used for occasions with better external environment; Applicable to high speed operation occasions;



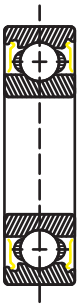
Elastic seal ring, non-contact (2RZ)

Sealing performance is on average level, applicable to occasions with better external environment; Applicable to occasions with higher rotational speed;



Elastic seal ring, contact type (2RS)

Sealing performance is good, applicable to occasions where there is higher requirement for external environment; Normal initial torque, applicable to occasions with general rotational speed;



Notes : 1.The above seal ring structures are for reference only. Specifications are subject to physical products.
2.Materials for seal ring and dust shield are subjected to change on the request of customers.
3.The above main forms of BMTV2 & WBT seal rings have special structure design for special uses.
Please contact BMTV2 & WBT Quality & Technology Department for all requests.

2. Materials of Bearings

Materials for bearing rings and parts largely determine the bearing's performance and life. BMTV2 & WBT puts more efforts to select materials for bearing rings and part suppliers in a rigorous manner. Materials & components of bearing rings for BMTV2 & WBT bearings are provided by the world's top suppliers special for serving bearing manufacturers, fundamentally solving the issue that our bearings lag behind imported bearings in terms of materials for a long time. BMTV2 & WBT boasts a set of strict & polished incoming goods inspection system. Before being put into storage, every batch of steels and parts is under systemic inspection, including analysis of material composition, metallographic analysis, accuracy check, assembly test, etc.

2.1 Materials for bearing ring & roller body

Bearing ring and roller body are mainly made of high G-Cr bearing steel. Listed below are compositions of material for bearing ring and roller body.

steel code	Chemical composition%								
Gcr 15 SAE52100 DIN 100 Cr6 JIS SUJ2	C	SI	MN	P	S	Cr	Mo	Cu	Ni
	0.95-1.05	0.15-0.35	0.25-0.45	<0.025	<0.025	1.40-1.65	—	<0.25	<0.30

Material for bearing ring and roller body mainly consists of high G-Cr bearing steel.

Bearing steel | High purity | Reduction of nonmetal oxide content | Removal of nonmetal impurities, reduction of oxide content of steel | Long life | BMTV2 & WBT high standard bearing steel

2.2 Material of cages

Material of cages needs good wear resistance, stable size & metal strength. Therefore, operation environment should be mainly considered in selection of material of cages

Drawing steel sheet cage

These light cages hold a high strength with reduced friction & wear in an effective way after surface treatment. The following table covers compositions of material for cold-rolled steel sheet.

steel code	Chemical composition%						
JISG 3141 SPCC	C	SI	MN	P	S	NI	Cr
	<012	—	<0.05	<0.04	<0.045	—	—

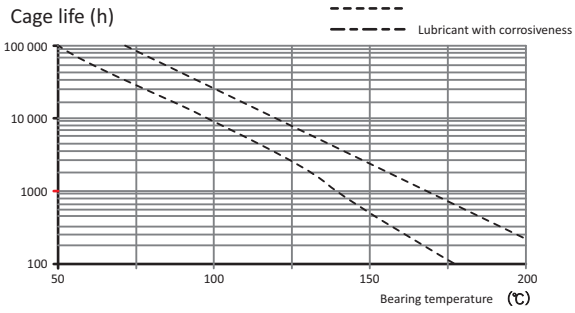
Brass cage

Cut brass cage is adopted in small and medium bearings. However, brass cage is not suitable for compressors with ammonia cooling due to potential seasonal cracking of brass. It is recommended to replace it with iron cage.

Nylon Cage

According to the type and usage of bearings, nylon cages are widely adopted, but they are inappropriate for environments where the temperature is above 120°C or below 40°C. Most of cast molding cages adopt nylon PA66 material, with or without glass fiber reinforcement whose advantage is a good combination of strength & elasticity.

Mechanism of nylon material including strength, elasticity & other elements, hinged on ambient temperature & degree of aging. The most important factors determining this kind of aging behavior are temperature, time & contact media (lubricant). The aging relation of glass fiber reinforcement nylon PA66 is shown as the right chart. Cage life is shortened in the wake of the rise of temperature and corrosiveness of lubricant, because the applicability of nylon cage depends on the operation conditions & life requirements.



Aging relation of glass fiber reinforcement nylon PA66

2.3 Materials for dust shield & seal ring

Material for dust shield

BMTV2 & WBT bearings use cold-rolled tin plate as the standard material for dust shields, but also use stainless steel of AISI- 300 specification at times

Material for seal ring

Seal rings are mainly made of NBR. For high temperature, fluoro rubbers & silicon rubbers are widely used as well.

Type	ASTM D1418 Name	Temperature range	Hardness (Shore A)	Features	Restriction
Nitrile buttadiene rubber	NBR	(-40°C ~120°C)	40~90	Low compression, high ductility, high corrosion resistance, superior oil resistance	Unsuitable for high temperature conditions; No exposure to the sun and corrosion of chemicals
Silicon rubber	MQ/PMQ VMQ/PVMP	(-70°C~200°C)	25~80	High temperature resistance and desiccation resistance, sunshine resistance and aging resistance to ozone	Poor surface abrasion performance and crack resistance, higher wear resistance
Hydrogenated (nitrile-butadiene rubber)	HNBR/NEM	(-35°C~165°C~)	50~90	Heat resistance, high ductility, chemical resistance	Unsuitable for ultra-low temperature conditions and shall avoid exposure to the sun and corrosion of chemicals
Fluoro rubber	FKM/FPM	(-28°C~200°C)	50~95	High temperature resistance, significant chemical resistance, corrosion resistance to petroleum products	It is not suitable for working conditions of low temperature
ACM rubber	ACM Rubber	(-18°C ~175°C)	40 ~90	Stronger resistance to hot oil, sunlight and ozone; higher crack resistance	Poor waterproof performance; Unsuitable for working condition of ultra-low temperature

Warning! Fluoro rubber is safe and harmless under normal working condition of below 200°C, but it will give off smoke if the temperature exceeds the ultimate temperature of 300°C,that is equivalent to flame for cutting steel tubes. In halation of the smoke is harmful to human bodies including eyes. In addition, the smoke should be avoided to contact skin.

3. Accuracy of Bearing

Accuracy of bearing includes dimensional accuracy and rotation accuracy, determined by ISO or JIS Standard (Accuracy of Roller Bearings). Dimensional accuracy indicates accuracy standard required for bearing installation into shaft or bearing housing. Rotation accuracy means allowed limit bounce during the bearing operation.

According to dimension tolerance and rotation accuracy, accuracy grade of BMTV2 & WBT deep groove ball bearings ranges from ABEC-1 to ABEC-7. ABEC-1 is standard grade, ABEC-3 is higher grade, and ABEC-5 above is used for special purposes. These tolerance grades are set in line with international standard IS0492. Other standard grades are shown as below.

Comparison table for accuracy grades according to various industrial standards.

Application Standard	Accuracy grade				
GB/T307.1.94	0	6	5	4	2
JISB1514	Class0	Class6	Class5	Class4	Class2
Is0492	Normal Class	Class6	Class5	Class4	Class2
DIN620	Po	P6	P5	P4	P2
AISI/AFBMA STD20	ABEC-1	ABEC-3	ABEC-5	ABEC-7	ABEC-9

Symbol: The following symbols are used for indicating bearing size, size deviation & bouncy error.

Symbols for dimensional accuracy and rotation accuracy of bearings

Dimensional accuracy:

Dimensional accuracy includes ID, OD, width, assembly height, chamfer dimension and taper tolerance or allowable value; dimension variable includes ID tolerance, mean ID tolerance, OD tolerance, mean OD tolerance, allowable value of ring sides out of parallel.

(I) Dimension

d = Nominal bearing ID
D = Nominal bearing OD
B = Nominal inner ring width
C = Nominal outer ring width
r = Chamfer dimension of inner ring or outer ring.

(II) Size deviation

△dmp = Size deviation of mean ID in plane
△Dmp = Size deviation of mean OD in plane
△Bs = Size deviation of inner ring width
△Cs = Size deviation of outer ring width

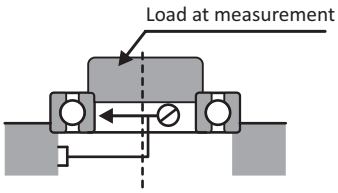
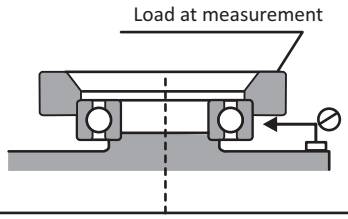
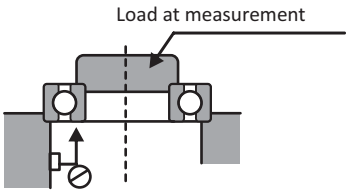
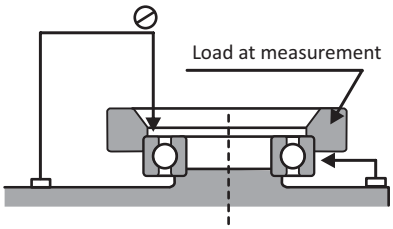
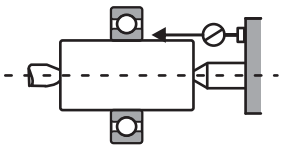
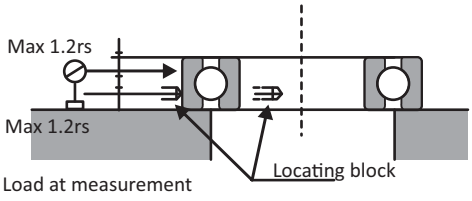
(III) Dimension variable

Vdmp = Variable of mean ID in plane
VDmp = Variable of mean OD in plane
VBs = Variableof inner ring width
Vcs = Variable of outer ring width

(IV) Rotation accuracy

Rotation accuracy includes radial & axial bounces of inner ring and outer ring, lateral bounces of inner ring & outer ring.

Kia = Radial bounce of inner ring
Sia = Axial bounce of inner ring
Sd = Lateral bounce of inner ring
Kea = Radial bounce of outer ring
Sea = Axial bounce of outer ring
SD = Lateral bounce of outer ring

Accuracy characteristic	Measurement method	
Radial bounce of inner ring (Kia)		Radial bounce of inner ring is the difference between maximum radial measurement value and minimum radial measurement value obtained after inner ring takes a turn.
Load at measurement Radial bounce of outer ring (Kea)		Radial bounce of outer ring is the difference between maximum radial measurement value and minimum radial measurement value obtained after outer ring takes a turn
Axial bounce of inner ring (Sia)		Axial bounce of inner ring is the difference between maximum axial measurement value and minimum axial measurement value obtained after inner ring takes a turn
Axial bounce of outer ring (Sea)		Axial bounce of outer ring is the difference between maximum axial measurement value and minimum axial measurement value obtained after outer ring takes a turn.
Lateral bounce of inner ring (Sd)		Lateral bounce of inner ring is the difference between maximum measurement value and minimum measurement value obtained after inner ring and mandrel takes a turn.
Lateral bounce of outer ring (SD)		Lateral bounce of outer ring is the difference between maximum measurement value and minimum measurement value obtained after outer ring takes a turn around positioning.

Tolerance grade of deep groove ball bearings ABEC-1 (P_0)

Inner ring

in μm.

d mm		Δ_{dmp}		V_{dp} [2] Diameter series			V_{dmp}	K_{ia}	ΔBs		V_{Bs}
				9	0,1	2,3,4					
Over	Under or equals to	High	Low	Max			Max	Max	High	Low	Max
[1] 0.6	2.5	0	-8	10	8	6	6	10	0	-40	12
2.5	10	0	-8	10	8	6	6	10	0	-120	15
10	18	0	-8	10	8	6	6	10	0	-120	20
18	30	0	-10	13	10	8	8	13	0	-120	20
30	50	0	-12	15	12	9	9	13	0	-120	20
50	80	0	-15	19	19	11	11	20	0	-150	25
80	120	0	-20	25	25	12	12	25	0	-200	25
120	180	0	-25	31	31	19	19	30	0	-250	30

Note : 1) indudes 0.6 2) no Diameter 7 & 8 series value

Outer ring

in μm.

D mm		Δ_{Dmp}		V_{dp} [2,4] Diameter series				V_{Dmp} [4]	K_{ea}	ΔCs		V_{Cs}
				Open type bearing			Sealed Bearing [2,3]					
				9	0, 1	2,3,4	2,3,4					
Over	Under or equals to	High	Low	Max				Max	Max	High	Low	Max
[1] 2.5	6	0	-8	10	8	6	10	6	15	For the same bearing,the value identifies with ΔBs and V_{Bs} of inner ring		
6	18	0	-8	10	8	6	10	6	15			
18	30	0	-9	12	9	7	12	7	15			
30	50	0	-11	14	11	8	16	8	20			
50	80	0	-13	16	13	10	20	10	25			
80	120	0	-15	19	19	11	26	11	25			
120	150	0	-18	23	23	14	30	14	40			
150	180	0	-25	31	31	19	38	19	45			
180	250	0	-30	38	38	23		23	50			

Note : 1) indudes 0.6 2) no Diameter 7 & 8 series value
3) application to groove ball bearing only

Formula for inch size and metric size conversed to each other: 1 inch =25.4 mm 1 mm =0.0393700787 inch

Tolerance grade of deep groove ball bearings ABEC-3 (P_5)

Inner ring

in μm.

d mm		Δ_{dmp}		V_{dp} 2) Diameter series			V_{dmp}	K_{ia}	ΔBs		V_{Bs}
				9	0,1	2,3,4					
Over	Under or equals to	High	Low	Max			Max	Max	High	Low	Max
1) 0.6	2.5	0	-7	9	7	5	5	5	0	-40	5
2.5	10	0	-7	9	7	5	5	6	0	-120	5
10	18	0	-7	9	7	5	5	7	0	-120	5
18	30	0	-8	10	8	6	6	8	0	-120	5
30	50	0	-10	13	10	8	8	10	0	-120	5
50	80	0	-12	15	15	9	9	10	0	-150	6
80	120	0	-15	19	19	11	11	13	0	-200	7
120	180	0	-18	23	23	14	14	18	0	-250	8

Note : 1) includes 0.6 2) no Diameter 7 and 8 series value

Outer ring

in μm.

D mm		Δ_{Dmp}		V_{dp} 2)4) Diameter series				V_{Dmp} 4)	K_{ea}	ΔCs		V_{Cs}
				Open type bearing			Sealed Bearing 2)3)					
				9	0, 1	2,3,4	2,3,4					
Over	Under or equals to	High	Low	Max				Max	Max	High	Low	Max
1) 2.5	6	0	-7	9	7	5	9	5	8			
6	18	0	-7	9	7	5	9	5	8			
18	30	0	-8	10	8	6	10	6	9			
30	50	0	-9	10	9	7	13	7	10			
50	80	0	-11	14	11	8	16	8	13			
80	120	0	-13	16	16	10	20	10	18			
120	150	0	-15	19	19	11	25	11	20			
150	180	0	-18	23	23	14	30	14	23			
180	250	0	-20	25	25	15		15	25			

For the same bearing,the value identifies with ΔBs and V_{Bs} of inner ring

Note : 1) includes 2.5 2) no Diameter 7and 8 series value 3)no Diameter 9 series value
4)Applicable to before stop ring is mounted and after stop ring is removed

Formula for inch size and metric size conversed to each other: 1 inch =25.4 mm 1 mm =0.0393700787 inch

Tolerance grade of deep groove ball bearings ABEC-5 (P_5)

Inner ring

in μm.

d mm		Δ_{dmp}		V_{dp} 2) Diameter series			V_{dmp}	K_{ia}	ΔBs		V_{Bs}
				9	0,1	2,3,4					
Over	Under or equals to	High	Low	Max			Max	Max	High	Low	Max
1) 0.6	2.5	0	-5	5	4	3	4	7	0	-40	5
2.5	10	0	-5	5	4	3	4	7	0	-40	5
10	18	0	-5	5	4	3	4	7	0	-80	5
18	30	0	-6	6	5	3	4	8	0	-120	5
30	50	0	-8	8	6	4	5	8	0	-120	5
50	80	0	-9	9	7	5	5	8	0	-150	6
80	120	0	-10	10	8	5	6	9	0	-200	7
120	180	0	-13	13	10	7	8	10	0	-250	8

Note : 1) includes 0.6 2) no Diameter 7 and 8 series value
3) application to groove ball bearing only

in μm.

Outer ring

D mm		Δ_{Dmp}		V_{Dp} 2) 3) Diameter series		V_{Dmp}	K_{ea}	S_D 4)	S_{ea} 4) 5)	ΔCs	V_{Cs}
				9	0,1,2,3,4						
Over	Under or equals to	High	Low	Max			Max	Max	High	Low	Max
1) 2.5	6	0	-5	5	4	3	5	8	8	For the same bearing,the value identifies with ΔBs and V_{Bs} of inner ring	5
6	18	0	-5	5	4	3	5	8	8		5
18	30	0	-6	6	5	3	6	8	8		5
30	50	0	-7	7	5	4	7	8	8		5
50	80	0	-9	9	7	5	8	8	10		6
80	120	0	-10	10	8	5	10	9	11		8
120	150	0	-11	11	8	6	11	10	13		8
150	180	0	-13	13	10	7	13	10	14		8
180	250	0	-15	15	11	8	15	11	15		10

Note : 1) includes 2.5 2) no Diameter 7 & 8 series value 3) no value for bearings with dust shield & seal ring
4) no value for bearings with flange 5) application to groove ball bearing only

Formula for inch size and metric size conversed to each other: 1 inch =25.4 mm 1 mm =0.0393700787 inch

Tolerance grade of deep groove ball bearings ABEC-7 (P_4)

Inner ring

in μm.

d mm		Δ_{dmp}		ΔDs		V_{dp} 2) Diameter series		V_{dmp}	K_{ia}	S_d	S_{ia}	ΔBs		V_{Bs}
						7,8,9	0,1,2,3,4							
Over	Under or equals to	High	Low	High	Low	Max		Max	Max	Max	Max	High	Low	Max
1) 0.6	2.5	0	-4	0	-4	4	3	2	2.5	3	3	0	-40	2.5
2.5	10	0	-4	0	-4	4	3	2	2.5	3	3	0	-40	2.5
10	18	0	-4	0	-4	4	3	2	2.5	3	3	0	-80	2.5
18	30	0	-5	0	-5	5	4	2.5	3	4	4	0	-120	2.5
30	50	0	-6	0	-	6	5	3	4	4	4	0	-120	3
50	80	0	-7	0	-7	7	5	3.5	4	5	5	0	-150	4
80	120	0	-8	0	-8	8	6	4	5	5	5	0	-200	4
120	180	0	-10	0	-10	10	8	5	6	6	7	0	-250	5

Note : 1) includes 0.6 2) diameter series 7 refers to micro bearing series 7 specified in GB273.3

Outer ring

in μm.

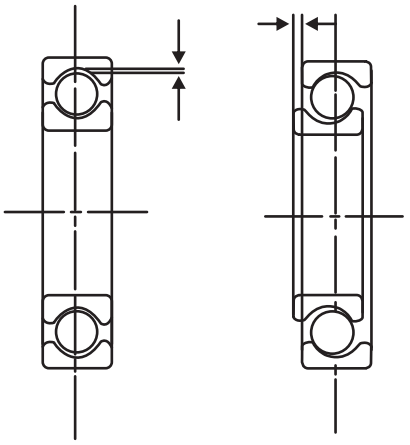
D mm		Δ_{Dmp}		ΔDs		V_{Dp} 2) Diameter series		V_{Dmp}	K_{ca}	S_D	S_{ia}	ΔCs	V_{Cs}
						7,8,9	1,7,2,3,4						
Over	Under or equals to	High	Low	High	Low	Max		Max	Max	Max	Max	High Low	Max
1) 2.5	6	0	-4	0	-4	4	3	2	3	4	5	For the same bearing,the value ΔBs identifies with and V_{Bs} of inner ring	2.5
6	18	0	-5	0	-4	4	3	2	3	4	5		2.5
18	30	0	-6	0	-5	5	4	2.5	4	4	5		2.5
30	50	0	-7	0	-6	6	5	3	5	4	5		2.5
50	80	0	-8	0	-7	7	5	3.5	5	4	5		3
80	120	0	-9	0	-8	8	6	4	6	5	6		4
120	150	0	-1	0	-9	9	7	5	7	5	7		5
150	180	0	-10	0	-10	10	8	5	8	5	8		5
180	250	0	-11	0	-11	11	8	6	10	7	10		7

Note : 1) includes 2.5 2) deviation applicable to bearings of diameter series 1、7、2、3 & 4
3)no value for closed type bearings 4)diameter series 7 refers to micro bearing series 7 specified in GB273.3

Formula for inch size and metric size conversed to each other: 1 inch =25.4 mm 1 mm =0.0393700787 inch

4.Internal Clearance

Internal clearance of bearing is referred to displacement produced when either inner or outer ring is fixed to make the other one move. Displacement produced by radial movement refers to radial clearance, while displacement produced by axial travel is called axial clearance (see right figure) In determination of internal clearance of bearing, in order to obtain a stable measured value, specified measured load will generally be applied to bearing. As a consequence, measured internal clearance is more than actual clearance (referred to as theoretical clearance), namely increases elastic deformation produced by measure load. In general, internal clearance of bearing is represented by theoretical clearance. Internal clearance of bearing will have an influence on bearing properties (service life, temperature rise, noise, vibration, etc.)



Internal radial clearance　　Internal axial clearance

4.1 Radial clearance

Radial clearance of deep groove ball bearing (without load)

Radial clearance of deep groove ball bearings can be divided into five groups as C2, CN, C3, C4 and C5, of which CN is the standard clearance. The following table lists specification parameters for these five groups.

ID				C2		CN		C3		C4		C5	
Over		Under or equals to											
mm	in	mm	in	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
2.5	0.0984	10	0.3937	0	7	2	13	8	23	14	29	20	37
10	0.3937	18	0.7087	0	9	3	18	11	25	18	33	25	45
18	0.7887	24	0.9449	0	10	5	20	13	28	20	36	28	48
24	0.9449	30	1.1811	1	11	5	20	13	28	23	41	30	53
30	1.1811	40	1.5748	1	11	6	20	15	33	28	46	40	64
40	1.5748	50	1.9685	1	11	6	23	18	36	30	51	45	73
50	1.9685	65	2.5591	1	15	8	28	23	43	38	61	55	90
65	2.5591	80	3.1496	1	15	10	30	25	51	46	71	65	105
80	3.1496	100	3.9370	1	8	12	36	30	58	53	84	75	120

in μm.

Radial clearance of deep groove ball bearing (without load)

According to MC standard, radial clearance of miniature bearings with inner hole of 10mm below in diameter can also be divided into five groups as MCI, MC2, MC3, MC4and MC5, of which MC3 is standard clearance. Listed below are specification parameters for these five groups.

Clearance code	MC1		MC2		MC3		MC4		MC5		MC6	
Clearance	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
	0	5	3	8	5	10	8	13	14	21	21	29

in μm.

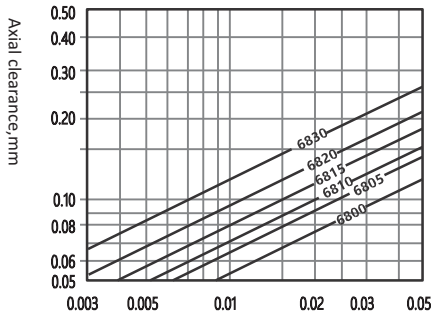
Radial clearance of deep groove ball bearing for motor (under no load)

Radial clearance of deep groove ball bearing for motor is expressed as CM. The value of CM clearance is shown as the following table.

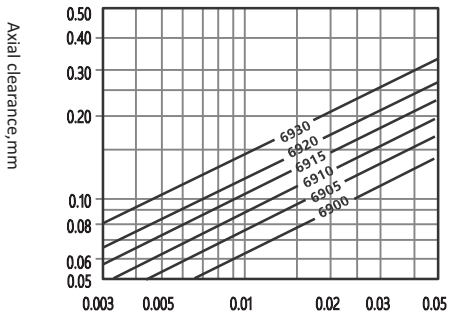
ID				CM	
Over		Under or equals to		Min	Max
mm	in	mm	in	um	um
10	0.3937	18	0.7087	4	11
18	0.7087	24	0.9449	5	12
24	0.9449	30	1.1811	5	12
30	1.1811	40	1.5748	9	17
40	1.5748	50	1.9685	9	17
50	1.9685	65	2.5591	12	22

inμm.

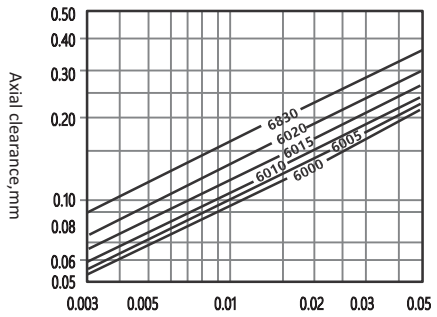
4.2 Function between radial clearance & axial clearance



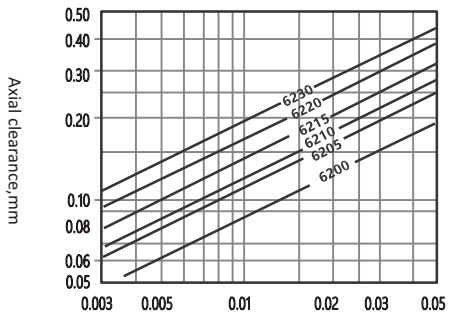
Radial clearance, mm
Radial and axial clearance,68 series



Radial clearance, mm
Radial and axial clearance,69 series



Radial clearance, mm
Radial and axial clearance,60 series



Radial clearance, mm
Radial and axial clearance,62 series

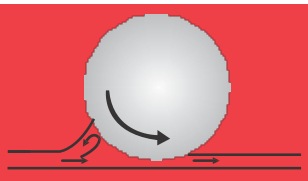
5. Lubrication of Bearings

Lubrication of bearings aims to form a layer of thin oil film on the surface of bearing ring and roller. The purpose of lubrication is to avoid direct contact of metal, thus eliminating the chance of abrasion to prolong bearing's life. Besides, lubricant can reduce noise and friction in operation of bearings, improving operation performance & protecting the bearing away from abrasion and dissipate heat.

Commonly used lubricants include lubrication oil and grease. Lubricant should be correctly selected based on various applications & different environments to optimize bearing properties.

Grease lubrication

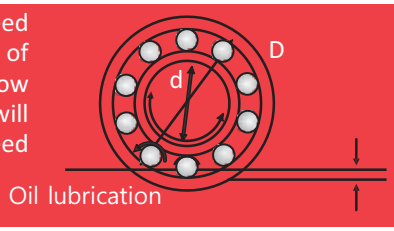
Lipid lubricants are much easier to use than oil lubricants. Due to its viscosity, grease is more durable and only needs simple sealing equipment to contain. Grease is hard to be changed, because the usual approach of it is to press grease into device to make fresh grease squeeze used grease out. General speaking, grease with low viscosity primary oil is more suitable for high speed operations at low temperature, while grease with high viscosity primary oil is suitable for heavy load.



Grease lubrication

Oil lubrication

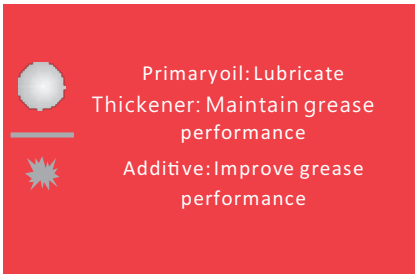
Oil lubrication is more suitable for applications under conditions of high speed and high temperature, effectively taking the heat generated in operation of bearings away. Viscosity of oil determines the effects of oil lubrication. Low viscosity will lead to inadequate formation of oil film, while high viscosity will increase viscous drag and temperature. In general, the higher rotational speed is, the lower viscosity of lubricant oil will be; the larger load is, the higher viscosity of lubricant oil will be.

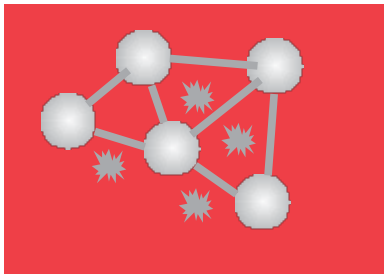


Oil lubrication

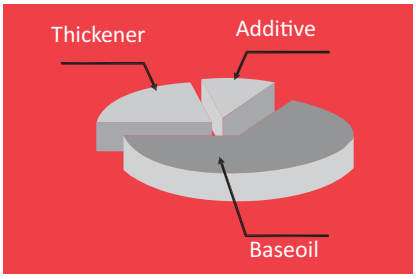
5.1 Components of grease

Basic components of grease are primary oil, thickener and additive.





Grease structure chart



Grease component

Primary oil

In grease, primary oil accounts for 75—96%, in mass fraction. The performance of grease mainly relies on the nature of primary oil. Particularly when it is with cold flow property and at high temperature, its service life is bound up with primary oil. Grease with low viscosity primary oil is usually applicable to low temperature and low load, white lubrication grease with high viscosity primary oil is applied to high temperature and high load. Primary oil used in grease includes mineral oil and synthetic oil.

The commonly used synthetic primary oils contain lipid oil, synthetic hydrocarbon oil, perfluoropolyether, silicon oil and PPO, etc.

Thickener

Thickener generally accounts for 4～ 20% in mass fraction. Its functions are to suspend primary oil, reduce the flow of primary oil, and increase adhesion of oil to friction surface. Thickener has two categories: metallic soap base and non-metallic soap base. Critical operating temperature, mechanical stability, water resistance and other properties of grease are determined by thickener, for example, sodium soap base can react with water to form a kind of latex, which can not be applied to running bearing in the atmosphere of high temperature.

Additive

In grease, primary oil accounts for 0.5 ~10% in mass fraction, which is used for the improvement of operating performance and life of grease. According to the classification by function, it can be divided into thickener (strong adhesion), antioxidant, extreme-pressure additive, corrosion inhibitor, etc.

5.2 Rolling torque, grease properties & filling amount

Grease parameters (viscosity, penetration) and its filling amount have an influence on rolling torque of bearings with further affect rotation at speed, leading to a temperature rise.
Generally, the increase of filling amount of lubricant and turning moment will cause temperature rise and velocity fluctuation. With the same grease filling amount, if viscosity is higher, rolling torque will be larger correspondingly.

Listed below are a few problems as a result of the increase of rolling torque.

Type	Description	Causes	Countermeasures
Temperature rise	Temperature of bearing is increasingly higher	Rotation of bearing causes lubricant to be excessively agitated and then produces shearing effect, thus causing temperature rise	Decrease filling amount of lubricant, change the type of oil circuit
Failure to meet the requirement of velocity	Motor is unable to reach the designed velocity at times	Grease overfilled	Select soft lubricant
Power over consumption	Consume too much power	Grease overfilled; lubricant with high working penetration will also give rise to this problem	Decrease filling amount of grease, replace the type of grease
Running current exceeded	Exceed running current	Filling amount of grease. flexibly agitated grease, working penetration	Select grease of flexible agitation type, decrease filling amount of grease
Velocity fluctuation	Motor is unable to reach the designed velocity at times	Grease floods into rotating raceway of roller bodies	Decrease filling amount of grease, use groove type grease, use grease with high softness, etc

Note: Penetration is a kind of measurement specifying tightness of lubrication grease.
The measuring device used is an inner ring with specified weight & shape, and penetration is the depth of penetrating into this inner ring (in 1/10mm)。

NLGL model	ASTM working penetration	
0	355~385	Grease is differentiated by code for different manufacturers. Code 250 and 300 calcium base grease and ferry grease generally use penetration (25C). while most of multi-purpose greases use NLGL model such as 0,1 and 2.
1	310~340	
2	265~295	
3	220~250	
4	175~205	
5	130~160	
6	85~115	

5.3 Grease brands & features

For grease in different brands with the same ingredients, propertiesmightbedifferent. Ina certainapplication, BMTV2 & WBT can offer hundreds of greases. The following table lists BMTV2 & WBT commonly used types. Formore information, please contact BMTV2 & WBT Technology Center.

Table

Manufacturer	Designation	Primary oil	Thickener	Viscosity of primary	C
Kyodo Yushi	MultempSRL	Polyol ester + diester	Lithium soap	26	
	MultempSB-M	Synthetic hydrocarbon	Polyurea	47.6	
	MultempET-K	Ether synthetic polyol ester	Aromatic diurea	95.1	
	MultempPS2	Diester + synthetic hydrocarbon	Lithium soap	15.3	
	SUPER N	Mineral oil + synthetic hydrocarbon	Polyurea	95.9	
Shell	RLQ2	Mineral oil	Lithium base	75.16	
	RL2	Mineral oil	Lithium base	75	
	RL3	Mineral oil	Lithium base	75	
	AV2(SBRG)	Mineral oil	Lithium base	130	
Kluber	BEP72-82	Ester	Polyurea	70	
	BQH72-102	Ester	Polyurea	100	
	ASONLCGLY32	Ester	Lithium base	25	
	ASONIC Q74-73	Ester	Polyurea	67.5	
	PETAMOGHY133	Mineral oil+ synthetic hydrocarbon	Polyurea	150	
Exxon Mobil	BEACON325	Synthetic oil	Lithium base	12	
	Polyrex EM	Mineral oil	Polyurea	115	
Cosmo	EMQ2(SBR)	Mineral oil	Lithium base	110	
	PNG	Mineral oil	Lithium base	73.5	
Dupont	Krytox240	Perfluoropolyether (PFPE/PFPAE)	Polytetrafluoroethylene (PTFE)	200	
Lubcon	N2	Ester	Polyurea	150	
Chevron	SRI-2	Paraffin base(ISOSYN) Mineral oil	Polyurea	100	
Jinzhi	Hangu2	Mineral oil	Lithium base	150	
Shift	570B-L	Mineral oil +Synthetic oil	Lithium soap	94	
	N180	Mineral oil +Synthetic oil	Polyurea	80	
	7702-L	Mineral oil +Synthetic oil	Polyurea	85	
	SRL-II	Synthetic oil	Lithium soap	32	
Fuda	FD-1	Mineral oil	Lithium soap	100	
	FD-2	Mineral oil	Lithium soap	110.5	
	FD-3	Mineral oil	Lithium soap	110	

6.Vibration & Noise

Other than load, speed, life and other basic bearing requirements, low noise and vibration have become increasingly important in practical applications. As we all know, overly vibration can result in early failure of bearings, and intensified vibration will increase energy consumption; on the other hand, high noise will ruin the living environment, either to individuals or families. For this reason, it is of vital importance for bearings in a sound operation to find out the source of vibration and noise and figure it out.

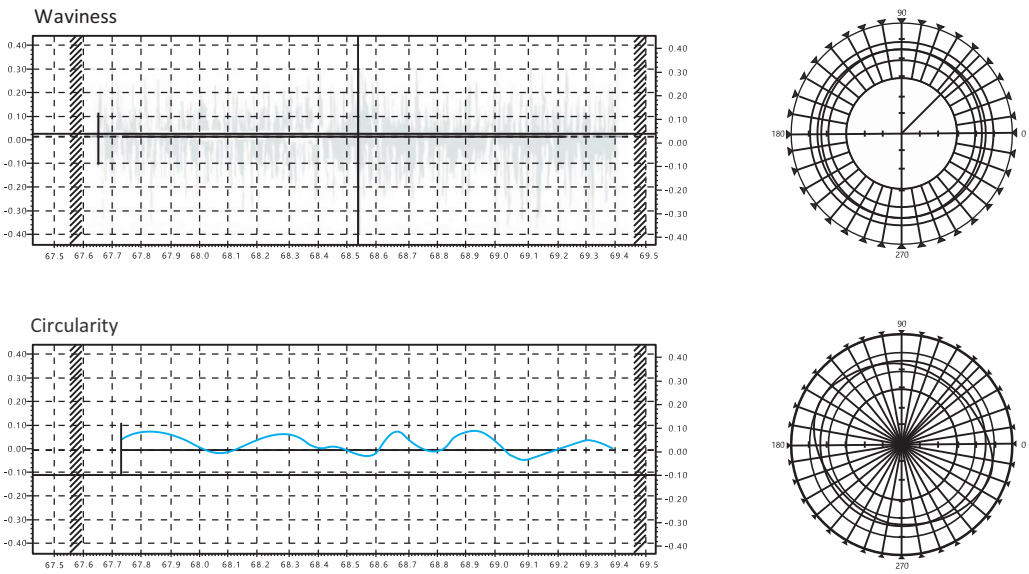
Possible cause → Vibration, Noise → Detect & analysis → Find out source → Improve → Perfect performance

BMTV2 & WBT analyses each influence factor on vibration and noise of bearings by means of Andrew Vibrometer, effectively helping to manufacture bearings with the features of low vibration and noise.

6.1 Influence factors on vibration & noise

Bearing ring factor

In rotation, bearing roller rolls on the raceway and makes a kind of steady and continuous noise, which is generally called raceway noise. Raceway noise would directly increase the vibration and noise of bearings. Such noise arises from the natural vibration of bearing ring as a result of loading. Vibration and noise of bearings can be lowered by improving circularity, waviness and other accuracy levels of bearing ring groove. In analysis of surface accuracy of bearing ring. BMTV2 & WBT analyze circularity and waviness of bearing ring with RONDCOM31C Circular Division Tester to detect the waviness within a few nanometers to provide a powerful guarantee for Quality Engineers to improve the quality of products.



Steel ball factor

Vibration value and surface accuracy of steel ball have a direct influence on the generation of vibration & noise of bearing. It is required by BMTV2 & WBT that the steel balls made by the manufacturer shall have a qualified vibration value and a good surface accuracy by improving the requirements of circularity and waviness, which means surface of steel balls observed under a 100x microscope shall not have scratches, scuffing, nicking and other defects, considered as the prerequisite achieve low vibration and noise of bearing.

Cage factor

During the rotation of bearing, both free vibration of the cage and its collision with roller element will make a noise, which is often called cage noise. Such noise will directly increase the vibration and noise of bearing, but it can be ameliorated by improving manufacturing accuracy of cage as well as optimizing its appropriate clearance and movement value. BMTV2 & WBT use cages offered by the manufacturers who all have a state-of-the-art production process and high manufacturing level. In terms of movement value of cages, dozens of experiments have been done and a desired value was obtained, providing help in the reduction of vibration and noise of bearing.

Cleanliness factor

Poor cleaning of bearings will directly increase their vibration and noise. Hence, it is particularly important for the improvement of bearing cleanliness to actively take advanced cleaning technologies and perform effective and thorough cleaning for components and assembled products. BMTV2 & WBT use the advanced vacuum degasification cleaning technology for effective cleaning of components of bearing; for the cleaning of assembled products, cleaning equipment with vacuum degasification ultrasonic process significantly improves the cleanliness of bearing, thus reducing the vibration and noise of bearing.

Grease factor

Grease, specifically to bearing, plays a key role in the reduction of vibration and noise. Grease of excellent properties not only extends the bearing life, but also reduces vibration and noise of bearing. Selection of bearing grease is particularly important for motors that have a special requirement for noise. BMTV2 & WBT can select various greases for customers in accordance with their different usage requirements, enabling vibration and noise of bearing to fully satisfy customer's special requirements.

6.2 Increase of vibration value and countermeasures

BMTV2 & WBT conducts 100 percent detection of noise and vibration of each ex-factory product. Besides, BMTV2 & WBT recently have significantly improved the design of deep groove ball bearings, further downgrading vibration and noise. Customers may pay extra attention to the following conditions.

Vibration value rise & countermeasures

Type	Description	Causes	Countermeasures
Vibration incurred from itself	Bearing itself produces vibration during the process of rotation	There are changes of circularity of steel balls and raceway of bearing	It can not be ignored, but vibration can be reduced by selection of correct clearance according to applications
Vibration due to exposure of bearing	Irregular noises are produced as a result of the degradation of bearing performance: which mostly exists in the oxidative and corrosive conditions	Contamination of surroundings affects bearing. Operating bearing under load is not given grease	This can be eliminated by designing isolation part in an appropriate way and providing sufficient lubrication
Vibration caused by misalignment	In operation, misaligned bearing produces noise	In installation, bearing is not aligned with shaft or bearing housing/accuracy of shaft & bearing housing is not enough	Good alignment methods and special alignment tools can reduce vibration/use high precision shaft and bearing housing
Vibration caused by damage itself	In operation, misaligned bearing produces noise	Incorrect running or improper assembly	Use correct assembly methods and assembly tools. Use induction heater and temperature preset mode

6.3 Parameters of Vibration and Noise

Vibration (acceleration) dB Comparison Table of FUDA Deep Groove Ball Bearing (based on Chinese standard JB/T7047-2006)

Bore Diameter d/mm	Diameter Series(0)					Diameter Series(2)					Diameter Series(3)				
	Z	Z1	Z2	Z3	Z4	Z	Z1	Z2	Z3	Z4	Z	Z1	Z2	Z3	Z4
3	35	34	32	28	24	36	35	32	30	26	37	36	33	31	27
4	35	34	32	28	24	36	35	32	30	26	37	36	33	31	27
5	37	36	34	30	26	38	37	34	32	28	39	37	35	33	29
6	37	36	34	30	26	38	37	34	32	28	39	37	35	33	29
7	39	38	35	31	27	40	38	36	34	29	41	39	37	35	30
8	39	38	35	31	27	40	38	36	34	29	41	39	37	35	30
9	41	40	36	32	28	42	40	37	35	30	43	41	39	37	32
10	43	42	38	33	28	44	42	39	35	30	46	44	40	37	32
12	44	43	39	34	29	45	43	39	35	30	47	45	40	37	32
15	45	44	40	35	30	46	44	41	36	31	48	46	42	38	33
17	46	44	40	35	30	47	45	41	36	31	49	47	42	38	33
20	47	45	41	36	31	48	46	42	38	33	50	48	43	39	34
22	47	45	41	36	31	48	46	42	38	33	50	48	43	39	34
25	48	46	42	38	34	49	47	43	40	36	51	49	44	41	37
28	49	47	43	39	35	50	48	44	41	37	52	50	45	42	38
30	49	47	43	39	35	50	48	44	41	37	52	50	45	42	38
32	50	48	44	40	36	51	49	45	42	38	53	51	46	43	39
35	51	49	45	41	37	52	50	46	43	39	54	52	47	44	40
40	53	51	46	42	38	54	52	47	44	40	56	54	49	45	41
45	55	53	48	45	42	56	54	49	46	43	58	56	51	47	44
50	57	54	50	47	44	58	55	51	48	45	60	57	53	49	46
55	59	56	52	49	46	60	57	53	50	47	62	59	54	51	48
60	61	58	54	51	48	62	59	54	51	48	64	61	56	53	50
65	49	48	46	41	/	50	49	47	42	/	51	50	48	43	/
70	50	49	47	42	/	51	50	48	43	/	52	51	49	44	/
75	51	50	48	43	/	52	51	49	44	/	53	52	50	45	/
80	52	51	49	44	/	53	52	50	45	/	54	53	51	46	/
85	53	52	50	45	/	54	53	51	46	/	56	55	52	47	/
90	54	53	52	47	/	56	55	53	48	/	58	57	54	49	/
95	56	55	54	49	/	58	57	55	50	/	60	59	56	51	/
100	58	57	56	51	/	60	59	57	52	/	62	61	58	53	/
105	60	59	58	53	/	62	61	59	54	/	64	63	60	55	/
110	62	61	60	55	/	64	63	61	56	/	66	65	62	57	/
120	64	63	62	57	/	66	65	63	58	/	68	67	64	59	/

Vibration (acceleration) μm/s Comparison Table of FUDA Deep Groove Ball Bearing (based on Chinese standard JB/T7047-2006)

Bore Diameter d/mm	V			V1			V2			V3			V4		
	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
3	80	44	44	60	35	32	48	26	22	31	16	15	28	10	10
4	80	44	44	60	35	32	48	26	22	31	16	15	28	10	10
5	110	72	60	74	48	40	58	36	30	35	21	18	32	11	11
6	110	72	60	74	48	40	58	36	30	35	21	18	32	11	11
7	130	96	80	92	66	54	72	48	40	44	28	24	38	12	12
8	130	96	80	92	66	54	72	48	40	44	28	24	38	12	12
9	130	96	80	92	66	54	72	48	40	44	28	24	38	12	12
10	160	120	100	120	80	70	90	60	50	55	35	30	45	14	15
12	160	120	100	120	80	70	90	60	50	55	35	30	45	14	15
15	210	150	120	150	100	85	110	78	60	65	46	35	52	18	18
17	210	150	120	150	100	85	110	78	60	65	46	35	52	25	25
20	260	190	150	180	125	100	130	100	75	80	60	45	60	25	25
22	260	190	150	180	125	100	130	100	75	80	60	45	60	30	32
25	260	190	150	180	125	100	130	100	75	80	60	45	60	30	32
28	260	190	150	180	125	100	130	100	75	80	60	45	60	35	40
30	300	240	190	200	150	130	150	120	100	90	75	60	70	35	40
32	300	240	190	200	150	130	150	120	100	90	75	60	70	35	40
35	300	240	190	200	150	130	150	120	100	90	75	60	70	42	45
40	360	300	260	240	180	160	180	150	130	110	90	80	82	50	50
45	360	300	260	240	180	160	180	150	130	110	90	80	82	60	60
50	420	320	320	280	200	200	210	160	160	125	100	100	95	70	70
55	420	360	360	280	220	200	210	180	180	125	110	110	95	70	70
60	480	360	440	320	220	240	240	180	200	145	110	130	100	80	80
65	300	260	420	180	160	240	130	100	150	105	80	105	50	50	75
70	360	310	460	200	180	280	150	120	200	110	90	135	58	58	88
75	360	310	460	200	180	280	150	120	200	110	90	135	58	58	88
80	420	360	540	240	210	320	180	120	240	130	110	160	65	65	100
85	420	360	540	240	210	320	180	150	240	130	110	160	65	65	100
90	480	420	600	290	250	370	210	180	270	145	125	180	75	75	115
95	480	420	600	290	250	370	210	180	270	145	125	180	75	75	115
100	560	490	670	340	300	420	250	215	310	170	145	200	88	88	135
105	560	490	670	340	300	420	250	215	310	170	145	200	88	88	135
110	640	570	750	400	350	480	290	260	350	190	175	225	100	100	160
120	640	570	750	400	350	480	290	260	350	190	175	225	100	100	160

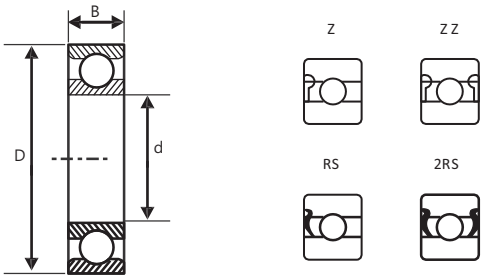
BMT Impex

BMTV2 WBT

THE FUTURE MOTION LEADER

Deep Groove Ball Bearing

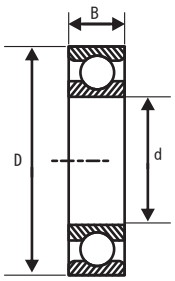
Deep Groove Ball Bearings->6000 Series

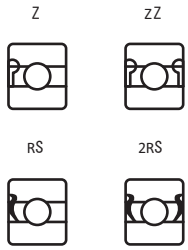


Bearing NO.	I.D		O.D		W		Load Rating(KN)		Steel Ball		Max Speed	
	d		D		B		Dynamic	Static	Quantity	Size	Grease	Oil
	mm	inch	mm	inch	mm	inch	Cr	Cor		mm	r/m	r/m
6000	10	0.3937	26	1.0236	8	0.3150	4.55	1.95	7	4.763	29000	34000
6001	12	0.4724	28	1.1024	8	0.3150	5.10	2.39	8	4.763	26000	30000
6002	15	0.5906	32	1.2598	9	0.3543	5.60	2.84	9	4.763	22000	26000
6003	17	0.6693	35	1.3780	10	0.3937	6.80	3.35	10	4.763	20000	24000
6004	20	0.7874	42	1.6535	12	0.4724	9.40	5.05	9	6.350	18000	21000
6005	25	0.9843	47	1.8504	12	0.4724	10.10	5.85	10	6.350	15000	18000
6006	30	1.1811	55	2.1654	13	0.5118	13.20	8.30	11	7.144	13000	15000
6007	35	1.3780	62	2.4409	14	0.5512	16.00	10.30	11	7.938	12000	14000
6008	40	1.5748	68	2.6772	15	0.5906	16.80	11.50	12	7.938	10000	12000
6009	45	1.7717	75	2.9528	16	0.6299	21.00	15.10	12	8.731	9200	11000
6010	50	1.9685	80	3.1496	16	0.6299	21.80	16.60	13	8.731	8400	9800
6011	55	2.1654	90	3.5433	18	0.7087	28.30	21.20	12	11.112	7700	9000
6012	60	2.3622	95	3.7402	18	0.7087	29.50	23.20	13	11.112	7000	8300
6013	65	2.5591	100	3.9370	18	0.7087	30.50	25.20	13	11.112	6500	7700
6014	70	2.7559	110	4.3307	20	0.7874	38.00	31.00	13	12.303	6100	7100
6015	75	2.9528	115	4.5276	20	0.7874	39.50	33.50	14	12.303	5700	6700
6016	80	3.1496	125	4.9213	22	0.8661	47.50	40.00	14	13.494	5300	6200
6017	85	3.3465	130	5.1181	22	0.8661	49.50	43.00	14	14.000	5000	5900
6018	90	3.5433	140	5.5118	24	0.9449	58.00	49.50	14	15.081	4700	5600
6019	95	3.7402	145	5.7087	24	0.9449	60.50	54.00	14	15.081	4500	5300
6020	100	3.9370	150	5.9055	24	0.9449	60.00	54.00	14	16.000	4200	5000

Deep Groove Ball Bearing

Deep Groove Ball Bearings->6200Series

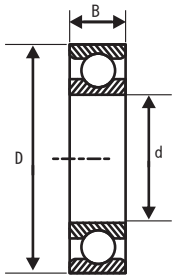


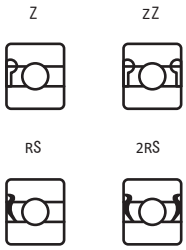


Bearing No.	I.D		O.D		W		Load Rating (KN)		Steel Ball		Max Speed	
	d		D		B		Dynamic	Static	Quantity	Size	Grease	Oil
	mm	inch	mm	inch	mm	inch	Cr	Cor		mm	r/m	r/m
6200	10	0. 3937	30	1. 1811	9	0.3543	5. 10	2. 39	8	4.763	25000	30000
6201	12	0. 4724	32	1. 2598	10	0.3937	6. 10	2. 75	7	5.953	22000	26000
6202	15	0. 5906	35	1. 3780	11	0.4331	7. 75	3. 60	8	5.953	19000	23000
6203	17	0. 6693	40	1. 5748	12	0.4724	9. 60	4. 60	8	6.747	18000	21000
6204	20	0. 7874	47	1. 8504	14	0.5512	12. 80	6. 65	8	7.938	16000	18000
6205	25	0. 9843	52	2. 0472	15	0.5906	14. 00	7. 85	9	7.938	13000	15000
6206	30	1. 1811	62	2. 4409	16	0.6299	19. 50	11. 30	9	9.525	11000	13000
6206/1	30	1. 1811	62	2. 4409	16	0.6299	23. 40	12. 80	8	11.112	11000	13000
6207	35	1. 3780	72	2. 8346	17	0.6693	25. 70	15. 30	9	11.112	9800	11000
6208	40	1. 5748	80	3. 1496	18	0.7087	29. 10	17. 80	9	12. 000	8700	10000
6209	45	1. 7717	85	3. 3465	19	0.7480	32. 50	20. 40	10	12. 000	7800	9200
6210	50	1. 9685	90	3. 5433	20	0.7874	35. 00	23. 20	10	12.700	7100	8300
6211	55	2. 1654	100	3. 9370	21	0.8268	43. 50	29. 20	10	14.288	6400	7600
6212	60	2. 3622	110	4. 3307	22	0. 8661	52. 50	36. 00	10	15.081	6000	7000
6213	65	2. 5591	120	4. 7244	23	0. 9055	57. 50	40. 00	10	16.669	5500	6500
6214	70	2. 7559	125	4. 9213	24	0. 9449	62. 00	44. 00	11	16.462	5100	6000
6215	75	2. 9528	130	5. 1181	25	0. 9843	66. 00	49. 50	11	17. 462	4800	5600
6216	80	3. 1496	140	5. 5118	26	1. 0236	72. 50	53. 00	11	18.256	4500	5300
6217	85	3. 3465	150	5. 9055	28	1. 1024	83. 50	64. 00	11	19.844	4200	5000
6218	90	3. 5433	160	6. 2992	30	1. 1811	96. 00	71. 50	10	22.225	4000	4700
6219	95	3. 7402	170	6. 6929	32	1. 2598	109.00	82. 00	10	24.000	3700	4400
6220	100	3. 9370	180	7. 0866	34	1. 3386	122. 00	93. 00	10	25. 400	3500	4200

Deep Groove Ball Bearing

Deep Groove Ball Bearings->6300 Series

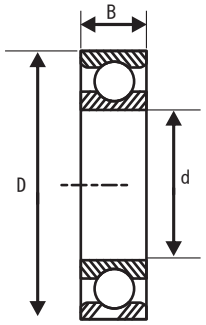


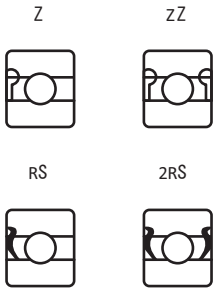


Bearing No.	I.D		O.D		W		Load Rating (KN)		Steel Ball		Max Speed	
	d		D		B		Dynamic	Static	Quantity	Size	Grease	Oil
	mm	inch	mm	inch	mm	inch	Cr	Cor		mm	r/m	r/m
6300	10	0.3937	35	1.3780	11	0. 4331	8.20	3.50	6	7.144	23000	27000
6300/1	10	0.3937	35	1.3780	11	0. 4331	7.65	3.47	7	6.35	23000	27000
6301	12	0.4724	37	1.4567	12	0. 4724	9.70	4.20	6	7.938	20000	24000
6302	15	0.5906	42	1.6535	13	0. 5118	11.40	5.45	7	7.938	17000	21000
6303	17	0.6693	47	1.8504	14	0. 5512	13.50	6.55	7	8.731	16000	19000
6304	20	0.7874	52	2.0472	15	0. 5906	15.90	7.90	7	9.525	14000	17000
6305	25	0.9843	62	2.4409	17	0. 6693	20.59	11.24	8	10.319	12000	14000
6305/1	25	0.9843	62	2.4409	17	0. 6693	21.20	10.90	7	11.500	12000	14000
6306	30	1.1811	72	2.8346	19	0. 7480	26.70	15.00	8	12.000	10000	12000
6307	35	1.3780	80	3.1496	21	0. 8268	33.50	19.10	8	13.494	8800	10000
6308	40	1.5748	90	3.5433	23	0. 9055	40.50	24.00	8	15.081	7800	9200
6309	45	1.7717	100	3.9370	25	0. 9843	53.00	32.00	8	17.462	7000	8200
6310	50	1.9685	110	4.3307	27	1. 0630	62.00	38.50	8	19.050	6400	7500
6311	55	2.1654	120	4.7244	29	1. 1417	71.50	45.00	8	20.638	5800	6800
6312	60	2.3622	130	5.1181	31	1. 2205	82.00	52.00	8	22.225	5400	6300
6313	65	2.5591	140	5.5118	33	1. 2992	92.50	60.00	8	24.000	4900	5800
6314	70	2.7559	150	5.9055	35	1. 3780	104.00	68.00	8	25.400	4600	5400
6315	75	2.9528	160	6.2992	37	1. 4567	113.00	77.00	8	26.988	4300	5000
6316	80	3.1496	170	6.6929	39	1. 5354	123.00	86.50	8	28.575	4000	4700
6317	85	3.3465	180	7.0866	41	1. 6142	133.00	97.00	8	30.163	3800	4500
6318	90	3.5433	190	7.4803	43	1. 6929	143.00	107.00	8	32.000	3600	4200
6319	95	3.7402	200	7.8740	45	1. 7717	153.00	119.00	8	34.000	3300	3900
6320	100	3.9370	215	8.4646	47	1. 8504	173.00	141.00	8	36.512	3200	3700

Deep Groove Ball Bearing

Deep Groove Ball Bearings->6700 Series

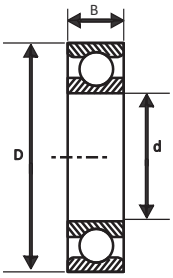


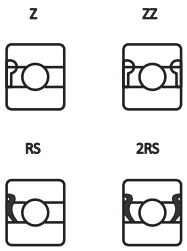


Bearing NO.	I.D		O.D		W		Load Rating(KN)		Steel Ball		Max Speed	
	d		D		B		Dynamic	Static	Quantity	Size	Grease	Oil
	mm	inch	mm	inch	mm	inch	Cr	Cor		mm	r/m	r/m
6700	10	0.3937	15	0.5906	3	0.1181	800	390	11	2.381	28000	36000
6701	12	0.4724	18	0.7087	4	0.1575	910	530	12	2.381	24000	32000
6702	15	0.5906	21	0.8268	4	0.1575	850	490	14	2.381	22000	30000
6703	17	0.6693	23	0.9055	4	0.1575	960	610	9	3.175	25000	32000
6704	20	0.7874	27	1.0630	4	0.1575	1030	720	10	3.175	22000	28000
6705	25	0.9843	32	1.2598	4	0.1575	1090	830	10	3.969	20000	26000
6706	30	1.1811	37	1.4567	4	0.1575	1170	980	11	3.969	19000	24000
6707	35	1.3780	44	1.7323	5	0.1969	1850	1630	11	4.763	17000	22000
6708	40	1.5748	50	1.9685	6	0.2362	2519	2234	12	4.763	14000	18000
6709	45	1.7717	55	2.1654	6	0.2362	2577	2401	14	4.763	12000	16000
6710	50	1.9685	62	2.4409	6	0.2362	2666	2636	14	4.763	12000	16000
6711	55	2.1654	68	2.6772	7	0.2756	2880	3070	14	4.763	12000	16000

Deep Groove Ball Bearing

Deep Groove Ball Bearings->6800/6900 Series

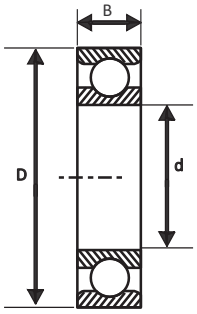


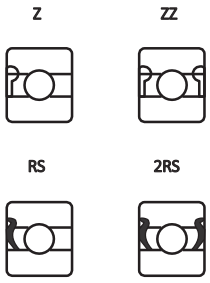


Bearing NO.	I.D		O.D		W		Load Rating(KN)		Steel Ball		Max Speed	
	d		D		B		Dynamic	Static	Quantity	Size	Grease	Oil
	mm	inch	mm	inch	mm	inch	Cr	Cor		mm	r/m	r/m
6800	10	0.3937	19	0.7480	5	0.1969	1.80	0.93	11	2.381	28000	36000
6801	12	0.4724	21	0.8268	5	0.1969	1.90	1.00	12	2.381	24000	32000
6802	15	0.5906	24	0.9449	5	0.1969	2.10	1.30	14	2.381	22000	30000
6803	17	0.6693	26	1.0236	5	0.1969	2.20	1.50	16	2.381	20000	28000
6804	20	0.7874	32	1.2598	7	0.2756	3.50	2.20	14	3.175	18000	24000
6805	25	0.9843	37	1.4567	7	0.2756	4.30	2.90	15	3.500	16000	20000
6806	30	1.1811	42	1.6535	7	0.2756	4.70	3.60	18	3.500	13000	17000
6807	35	1.3780	47	1.8504	7	0.2756	4.90	4.00	20	3.500	11000	15000
6808	40	1.5748	52	2.0472	7	0.2756	5.10	4.40	22	3.500	10000	13000
6809	45	1.7717	58	2.2835	7	0.2756	6.40	5.60	22	3.969	9000	12000
6810	50	1.9685	65	2.5591	7	0.2756	6.60	6.10	24	3.969	8500	10000
6811	55	2.1654	72	2.3846	9	0.3543	8530	8080	9	3.175	25000	32000
6812	60	2.3622	78	3.0709	10	0.3937	9200	8760	10	3.175	22000	28000
6813	65	2.5591	85	3.3465	10	0.3937	10510	9420	10	3.969	20000	26000
6814	70	2.7559	90	3.5433	10	0.3937	10890	10090	11	3.969	19000	24000
6815	75	2.9528	95	3.7402	10	0.3937	11230	10760	11	4.763	17000	22000
6816	80	3.1496	100	3.9370	10	0.3937	11320	11080	12	4.763	14000	18000
6817	85	3.3456	110	4.3307	13	0.5118	17599	18300	14	4.763	12000	16000
6818	90	3.5433	115	4.5276	13	0.5118	17853	18961	14	5.556	10000	13000
6819	95	3.7402	120	4.7244	13	0.5118	18089	19616	14	6.747	9500	12000
6820	100	3.9370	125	4.9213	13	0.5118	18340	20266	15	6.747	8500	11000
6821	50	1.9685	72	2.8346	12	0.5118	18912	20924	16	6.747	8000	9500

Deep Groove Ball Bearing

Deep Groove Ball Bearings->6800/6900 Series

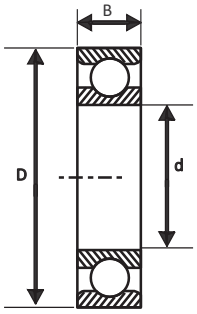


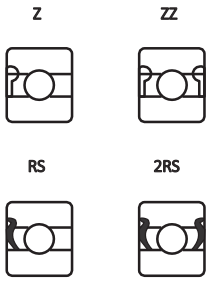


Bearing NO.	I.D		O.D		W		Load Rating(KN)		Steel Ball		Max Speed	
	d		D		B		Dynamic	Static	Quantity	Size	Grease	Oil
	mm	inch	mm	inch	mm	inch	Cr	Cor		mm	r/m	r/m
6822	110	4.3307	140	5.5118	16	0.6299	28100	30700	11	2.381	28000	36000
6824	120	4.7244	150	5.9055	16	0.6299	28900	32900	12	2.381	24000	32000
6826	130	5.1181	165	6.4961	18	0.7087	37900	42900	14	2.381	22000	30000
6900	10	0.3937	22	0.8661	6	0.2362	2.70	1.30	9	3.175	25000	32000
6901	12	0.4724	24	0.9449	6	0.2362	2.90	1.50	10	3.175	22000	28000
6902	15	0.5906	28	1.1024	7	0.2756	4.30	2.30	10	3.969	20000	26000
6903	17	0.6693	30	1.1811	7	0.2756	4.60	2.60	11	3.969	19000	24000
6904	20	0.7874	37	1.4567	9	0.3543	6.40	3.70	11	4.763	17000	22000
6905	25	0.9843	42	1.6535	9	0.3543	7.00	4.50	12	4.763	14000	18000
6906	30	1.1811	47	1.8504	9	0.3543	7.20	5.00	14	4.763	12000	16000
6907	35	1.3780	55	2.1654	10	0.3937	9.50	6.80	14	5.556	10000	13000
6908	40	1.5748	62	2.4409	12	0.4724	13.70	9.90	14	6.747	9500	12000
6909	45	1.7717	68	2.6772	12	0.4724	14.10	10.90	15	6.747	8500	11000
6910	50	1.9685	72	2.8346	12	0.4724	14.50	11.70	16	6.747	8000	9500

Deep Groove Ball Bearing

Deep Groove Ball Bearings->6800/6900 Series

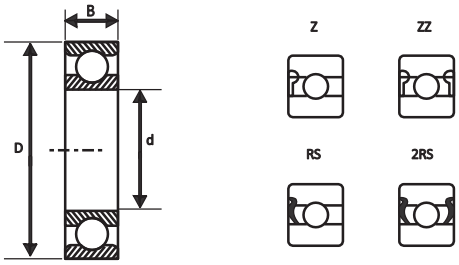




Bearing NO.	I.D		O.D		W		Load Rating(KN)		Steel Ball		Max Speed	
	d		D		B		Dynamic	Static	Quantity	Size	Grease	Oil
	mm	inch	mm	inch	mm	inch	Cr	Cor		mm	r/m	r/m
6911	55	2.1654	80	3.1496	13	0.5118	14820	12690	11	2.381	28000	36000
6912	60	2.3622	85	3.3465	13	0.5118	15080	13480	12	2.381	24000	32000
6913	65	2.5591	90	3.5433	13	0.5118	19950	17490	14	2.381	22000	30000
6914	70	2.7559	100	3.9370	16	0.6299	25950	21850	9	3.175	25000	32000
6915	75	2.9528	105	4.1339	16	0.6299	26780	23560	10	3.175	22000	28000
6916	80	3.1496	110	4.3307	16	0.6299	27590	25280	10	3.969	20000	26000
6917	85	3.3465	120	4.7244	18	0.7087	31900	29700	11	3.969	19000	24000
6918	90	3.5433	110	1.456	18	0.7087	32800	31500	11	4.763	17000	22000
6919	95	3.7402	110	1.653	18	0.7087	33700	33300	12	4.763	14000	18000
6920	100	3.9370	110	1.850	20	0.7874	39901	39135	14	4.763	12000	16000
6921	105	4.1339	110	2.165	20	0.7874	41005	41410	14	5.556	10000	13000
6922	110	4.3307	110	2.440	20	0.7874	42090	43537	14	6.747	9500	12000
6924	120	4.7244	110	2.677	22	0.8661	55000	56900	15	6.747	8500	11000
6926	130	5.1181	110	2.834	24	0.9449	65100	67200	16	6.747	8000	9500

Deep Groove Ball Bearing

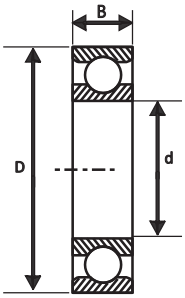
Deep Groove Ball Bearings->Miniature Series

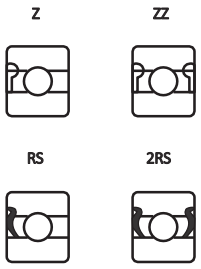


Bearing NO.	I.D		O.D		W		Load Rating(KN)		Max Speed
	d		D		B		Dynamic	Static	Oil
	mm	inch	mm	inch	mm	inch	Cr	Cor	r/m
603	3	0.1181	9	0.3543	3	0.1181	486	223	37800
604	4	0.1575	12	0.4724	4	0.1575	960	350	37800
605	5	0.1969	14	0.5512	5	0.1969	1070	420	37800
606	6	0.2362	17	0.6693	6	0.2362	2034	756	37800
607	7	0.2756	19	0.7480	6	0.2362	2358	954	36000
608	8	0.3150	22	0.8661	7	0.2756	2970	1224	34200
609	9	0.3543	24	0.9449	7	0.2756	3015	1269	32400
623	3	0.1181	10	0.3937	4	0.1575	640	220	32400
624	4	0.1575	13	0.5118	5	0.1969	1566	603	38700
625	5	0.1969	16	0.6299	5	0.1969	1557	603	38700
626	6	0.2362	19	0.7480	6	0.2362	2358	954	34200
627	7	0.2756	22	0.8661	7	0.2756	2970	1224	32400
628	8	0.3150	24	0.9449	8	0.3150	3015	1269	30600
629	9	0.3543	26	1.0236	8	0.3150	4095	1773	28800
634	4	0.1575	16	0.6299	5	0.1969	2358	1880	680
635	5	0.1969	19	0.7480	6	0.2362	2358	954	34200
636	6	0.2362	22	0.8661	7	0.2756	2970	1224	30600
637	7	0.2756	26	1.0236	9	0.3543	3600	1422	27000
638	8	0.3150	28	1.1024	9	0.3543	4095	1773	25200
639	9	0.3543	30	1.1811	10	0.3937	4590	2151	23400
684	4	0.1575	9	0.3543	4	0.1575	480	170	38700
685	5	0.1969	11	0.4331	5	0.1181	770	320	38700

Deep Groove Ball Bearing

Deep Groove Ball Bearings->Miniature Series





Bearing NO.	I.D		O.D		W		Load Rating(KN)		Max Speed
	d		D		B		Dynamic	Static	Oil
	mm	inch	mm	inch	mm	inch	Cr	Cor	r/m
686	6	0.2362	13	0.5118	4	0.1378	972	396	43200
687	7	0.2756	14	0.5512	3.5	0.1378	1170	510	43200
688	8	0.3150	16	0.6299	4	0.1575	1125	531	38700
689	9	0.3543	17	0.6693	4	0.1575	1330	660	38700
693	3	0.1181	8	0.3150	3	0.1575	430	170	45000
694	4	0.1575	11	0.4331	4	0.1575	960	350	45000
695	5	0.1969	13	0.5118	4	0.1575	972	387	45000
696	6	0.2362	15	0.5906	5	0.1969	1566	603	42300
697	7	0.2756	17	0.6693	5	0.1969	1449	643	37800
698	8	0.3150	19	0.7480	6	0.2362	2016	814	37800
699	9	0.3543	20	0.7874	6	0.2362	1908	886	36000

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