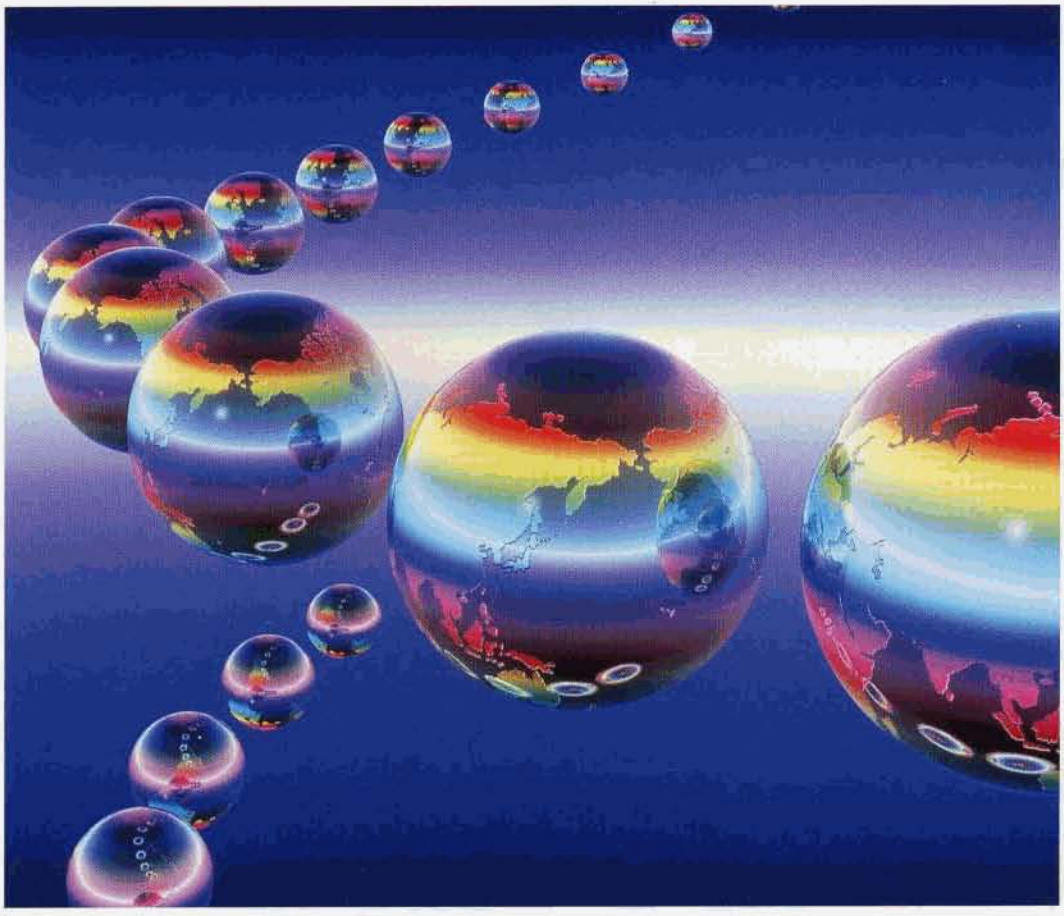
KSK BALL BEARINGS

PRODUCT REFERENCE AND INTERCHANGE CATALOGUE

KSK



It is our great pleasure to present you with this copy of our catalogue, covering various product lines available from us.

Every effort has been taken to ensure the accuracy of the data contained in this catalogue.

No liability can be accepted for any errors or omissions.

Due to limited space, not all items are necessarily listed in this catalogue.

Apart from the standardized sizes listed in this catalogue, we manufacture non-standardized sizes as per our customers' special specifications.
We welcome your inquiries.

KSK

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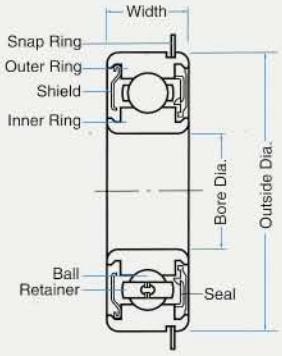


Open type

Shielded type

Sealed type

KSK

BALL BEARING CONSTRUCTION

Ball bearings consist of rings with raceway (an inner ring and an outer ring) , rolling elements (balls) and a retainer.

The retainer that separates the rolling elements at regular intervals holds them in place within the inner and outer raceways and allows them to rotate freely.

The retainer only serves to hold the balls at equal distances from one another.

Balls geometrically contact the raceway surfaces of the inner & outer ring at points.

DEEP GROOVE BALL BEARINGS

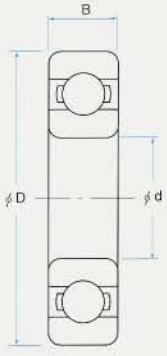
Deep groove ball bearings are in very wide use, and they are suitable for high speed operation.

A deep groove is formed on each inner and outer ring of a deep groove ball bearing.

Radial load and axial load in either direction and the resultant forces of these loads can be sustained.

They are available in open or shielded or sealed type, and are prelubricated with grease or rust preventive oil.

They are also available with a snap ring on outside diameter.



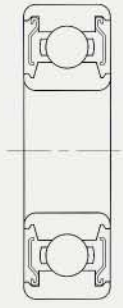
d = Bore Diameter

D= Outside Diameter

B= Width

OPEN

Z
ONE SHIELD

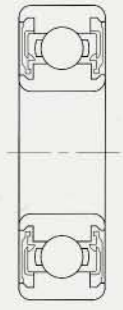


ZZ
TWO SHIELDS

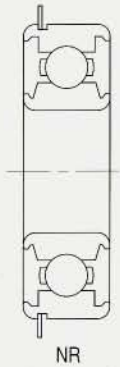
RS
ONE CONTACT
SEAL

2RS
TWO CONTACT
SEALS

VS ONE
NON-CONTACT
SEAL



2VS TWO
NON-CONTACT
SEALS



NR
SNAP RING

Our "KSK" brand ball bearings are available in the following materials:–

(1) high carbon chrome steel JIS SUJ2 (equivalent to AISI 52100 or DIN 100CR6)
(2) SUS440C stainless steel (equivalent to AISI 440C)
(3) SUS420J2 stainless steel
(4) other materials such as QD51 stainless steel, etc.

Materials Table (1) High carbon chrome bearing steel

Symbol	Chemical composition %							
	C	Si	Mn	P	S	Cr	Ni	Mo
SUJ2 (AISI 52100)	0.95~1.10	0.15~0.35	0.50max.	0.025max.	0.025max.	1.30~1.60	–	–

Materials Table (2) Stainless steel

Symbol	Chemical composition %							
	C	Si	Mn	P	S	Cr	Ni	Mo
SUS440C (AISI 440C)	0.95~1.20	1.00max.	1.00max.	0.04max.	0.030max.	16.00~18.00	0.6max.	0.75max.

Materials Table (3) Stainless steel

Symbol	Chemical composition %							
	C	Si	Mn	P	S	Cr	Ni	Mo
SUS420J2 (AISI 420J2)	0.26~0.40	1.00max.	1.00max.	0.04max.	0.030max.	12.00~14.00	0.6max.	–

Materials Table (4) Stainless steel

Symbol	Chemical composition %							
	C	Si	Mn	P	S	Cr	Ni	Mo
QD51	0.65~0.75	0.35max.	0.45~0.75	0.04max.	0.030max.	13.00~14.00	0.5max.	0.75max.

BEARING TOLERANCES

Tolerances for rolling bearings, i.e., dimensional accuracy, running accuracy, etc., are regulated by standards such as JIS and ISO.

For dimensional accuracy, these standards specify the tolerances and permissible values for the boundary dimensions (bore diameter, outside diameter, width, assembled bearing width, chamfer and taper).

For machining accuracy, the standards provide permissible variation limits on bore, mean bore, outside diameter, mean outside diameter and ring width.

Rotational precision is defined as the permissible values for bearing runout.

Bearing runout tolerances are included in the standards for inner and outer ring radial & axial runout, inner ring side runout with bore, and outer ring outside surface runout with side.

Tolerances and permissible values are established for each tolerance grade or class.

A comparison of relative tolerance classifications between JIS B1514 standard classes and other standards is shown below.

Tolerance Classes

Deep Groove Ball Bearings	Applicable Tolerance Classes [Equivalent standards (Reference)]				
JIS (1)	Class 0	Class 6	Class 5	Class 4	Class 2
DIN (2)	P 0	P 6	P 5	P 4	P 2
AFBMA (3)	ABEC 1	ABEC 3	ABEC 5 (CLASS 5P)	ABEC 7 (CLASS 7P)	ABEC 9 (CLASS 9P)

Note (1) JIS : Japanese Industrial Standards (2) DIN : Deutsche Industrie Norm
(3) AFBMA : Anti-Friction Bearing Manufacturers Association

Radial Internal Clearances in Deep Groove Ball Bearings

Units : μm

Nominal Bore Diameter d (mm)		Clearance									
		C 2		Normal		C 3		C 4		C 5	
over	incl	min	max	min	max	min	max	min	max	min	max
10only		0	7	2	13	8	23	14	29	20	37
10	18	0	9	3	18	11	25	18	33	25	45
18	24	0	10	5	20	13	28	20	36	28	48
24	30	1	11	5	20	13	28	23	41	30	53
30	40	1	11	6	20	15	33	28	46	40	64
40	50	1	11	6	23	18	36	30	51	45	73

Radial Internal Clearances of Small and Miniature Bearings

Units : μm

Clearance Mark	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	13	20	20	28

Note : Standard clearance is MC3.

Deep Groove Ball Bearings for Electric Motors

Units : μm

Nominal Bore Diameter d (mm)		Clearance	
		C M	
over	incl	min	max
10 (inch)	18	4	11
18	30	5	12
30	50	9	17

LUBRICATION

The purpose of bearing lubrication is to form a thin oil (or grease) film on the contact surfaces and to prevent direct metallic contact between various rolling and sliding elements, and to achieve the following effects:–

(1) reduction of friction or wear
(2) dissipation of friction heat
(3) prolonged bearing life
(4) prevention of rust
(5) protection against harmful elements such as dust, water, etc.

It is imperative that effectively designed sealing arrangement and good quality lubricant be used for the operating conditions, in order to achieve maximum effects.

PROPERTIES OF LUBRICATING GREASES WHICH ARE COMMONLY USED FOR OUR SHIELDED AND SEALED BALL BEARINGS

Name	Manufacturer	Thickeners	Base Oils	Dropping point (℃)	Consistency	Working Temperature Rang (℃)	(℉)
Beacon 325	Esso Standard	Lithium	Diester Oil	191	290	–55 ~ +100	–67 ~ +212
Andok C		Sodium Complex	Mineral Oil	OVER 260	205	0 ~ +100	+32 ~ +212
Andok B		Sodium Complex	Mineral Oil	245	280	–10 ~ +100	+14 ~ +212
Isoflex NBU 15	Klüber	Barium Complex	Diester Oil + Mineral Oil	250	280	–30 ~ +120	–22 ~ +248
Barrierta L 55/2		Fluorine Complex	Perfluoropolyether Oil (Fluorine Oil)	-	280	0 ~ +200	+32 ~ +392
Barrierta IMI		Fluorine Complex	Perfluoropolyether Oil (Fluorine Oil)	-	280	0 ~ +200	+32 ~ +392
Staburags NBU12		Barium Complex	Mineral Oil	250	270	0 ~ +130	+32 ~ +266
Alvania 2	Shell	Lithium	Mineral Oil	182	277	–10 ~ +110	+14 ~ +230
Alvania 3		Lithium	Mineral Oil	183	240	–10 ~ +110	+14 ~ +230
Aeroshell 7		Micro Gel	Diester Oil	OVER 260	288	–55 ~ +100	–67 ~ +212
Molykote 33M	Dow Corning	Lithium	Silicone Oil	210	260	–70 ~ +180	–94 ~ +356
Molykote 44M		Lithium	Silicone Oil	204	260	–40 ~ +200	–40 ~ +392
Molykote FS3451		Fluorine Complex	Fluorosilicone Oil	OVER 260	285	0 ~ +180	+32 ~ +356
Multemp PS 2	Kyodo Yushi	Lithium	Diester Oil + Mineral Oil	189	280	–55 ~ +110	–58 ~ +230
Multemp SRL		Lithium	Ester Oil	190	255	–40 ~ +130	–40 ~ +266
Chevron SRI-2	Caltex	Polyurea	Mineral Oil	243	280	–30 ~ +175	–22 ~ +347
Krytox 240AC	Dupont	Fluorine Complex	Perfluoropolyether Oil (Fluorine Oil)	-	282	0 ~ +200	+32 ~ +392
Mobil grease 28	Mobil Oil	Bentnite	Synthetic Hydrocarbon Oil	OVER 260	280	–40 ~ +140	–40 ~ +284