Intercontinental Bearing Supply Company, Inc.

Catalog of Precision Miniature and Thin Section Ball Bearings

IBSCO

Intercontinental Bearing Supply Co., Inc.

Founded in 1981, Intercontinental Bearing Supply Co. has acquired a leadership position as a supplier of high quality bearing products to the OEM and Distributor marketplace.

Our position of leadership is maintained through:

A total commitment to our customers complete satisfaction
We acknowledge our customer as our reason for being

Significant investments in high quality inventories
Proven, reliable brand named products

Staying at the leading edge of new bearing technologies
Technology keeps our customers ahead of the competition

The application of advanced clean room design & practice
Certified annually to Federal Standard 209, and factory authorized by both NMB & NHBB

Advanced computer application and integration
Real time response and integration in everything we do

Acquisition and continuous training of dedicated personnel
Knowledge and proficiency our customers rely on

ISO 9001 Certification
Accountability of operations & quality control

A commitment to continuous improvement
Embraced and accepted as a never ending goal

Strong vendor alliances and relationships
Representing only the very best in quality bearing products

The employees and management of IBSCO are proud of our past and present accomplishments, and we look forward to the continued growth of strong customer relationships based on mutually beneficial business strategies.

Randall Burton, President

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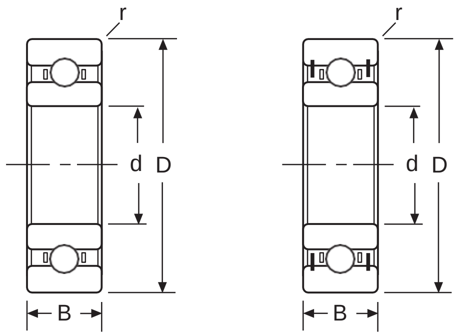
Products

Engineering

INCH SERIES

Miniature - Unflanged

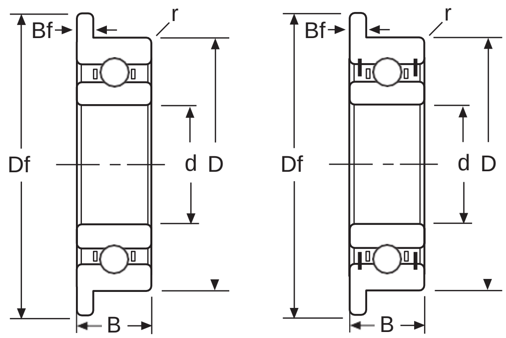


Notes:
1. Basic numbers shown include code "S" for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the "S" prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.

BORE d	O.D. D	IBSCO NUMBER OPEN	WIDTH B	IBSCO NUMBER 1 SHIELD	WIDTH B1	IBSCO NUMBER 2 SHIELDS	WIDTH B2	FILLET RADIUS r
.0400	.1250	**SR09**	.0469	**-**	-	**-**	-	.003
.0400	.1250	**-**	-	**-**	-	**-**	-	.003
.0469	.1562	**SR0**	.0625	**SR0Z**	.0937	**SR0ZZ**	.0937	.003
.0469	.1875	**-**	-	**-**	-	**SR0ZZA11**	.0937	.003
.0550	.1875	**SR1**	.0781	**SR1Z**	.0937	**SR1ZZ**	.1094	.003
.0781	.1875	**-**	-	**-**	-	**-**	-	.003
.0781	.2500	**SR1-4**	.0937	**SR1-4Z**	.1094	**SR1-4ZZ**	.1406	.003
.0781	.2500	**-**	-	**-**	-	**-**	-	.003
.0781	.2500	**-**	-	**-**	-	**-**	-	.003
.0781	.2500	**-**	-	**-**	-	**SR1-4ZZY05**	.1094	.003
.0800	.2500	**-**	-	**SR1-4ZN6**	.1094	**-**	-	.003
0902	.3125	**-**	-	**SR1-5ZN**	.1094	**-**	-	.003
.0937	.1875	**SR133**	.0625	**SR133Z**	.0937	**SR133ZZ**	.0937	.003
.0937	.2500	**-**	-	**SR144ZN**	.0937	**SR144ZZN**	.1094	.003
.0937	.2500	**-**	-	**-**	-	**SR144ZZY4N**	.0937	.003
.0937	.2750	**-**	-	**SR133ZSD501**	.0625	**-**	-	.003
.0937	.2883		-	**SR133ZA1202**	.0625	**-**	-	.003
.0937	.3125	**SR133A02**	.0625	**-**	-	**-**	-	.003
.0937	.3125	**SR1-5**	.1094	**SR1-5Z**	.1094	**SR1-5ZZ**	.1406	.003
.0937	.4100	**-**	-	**SR1-5ZA91**	.1094		-	.003
.0937	.4250	**SR144A62N**	.0937	**-**	-	**-**	-	.003
.0937	.4500	**SR1-5A62**	.1094	**-**	-	**-**	-	.003
.0947	.2500	**SR144N1**	.0937	**-**	-	**-**	-	.003
.1250	.2188	**SR1 1/2-18**	.0937	**-**	-	**-**	-	.005
.1250	.2500	**SR144Y02**	.0625	**-**	-	**-**	-	.003
.1250	.2500	**-**	-	**SR144ZW05**	.1094	**SR144ZZY04**	.0937	.003
.1250	.2500	**SR144**	.0937	**SR144Z**	.0937	**SR144ZZ**	.1094	.003
.1250	.3125	**-**	-	**-**	-	**SR2-5ZZY05**	.1094	.003
.1250	.3125	**SR2-5**	.1094	**SR2-5Z**	.1094	**SR2-5ZZ**	.1406	.003
.1250	.3750	**SR144A0223**	.0650	**-**	-	**-**	-	.003
.1250	.3750	**-**	-	**SR144ZA02**	.0937	**SR144ZZA0204**	.0937	.003
.1250	.3750	**-**	-	**-**	-	**SR2-6ZZY05**	.1094	.005

INCH SERIES

Miniature - *Flanged*



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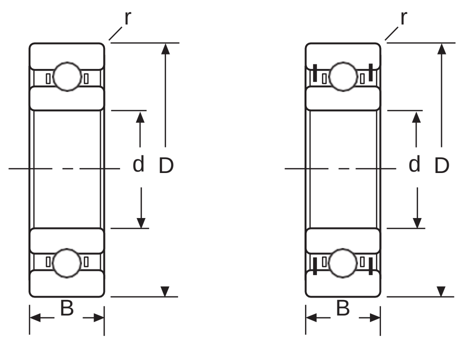
SFR09	.0469	.171	.013	- -	-	-	-	9	3	192
SFR09X2	.0469	.171	.013	- -	-	-	-	11	3	183
SFR0	.0625	.203	.013	SFR0Z (ZZ)	.0937	.203	.031	16	5	149
-	-	-	-	- -	-	-	-	16	5	149
SFR1	.0781	.234	.023	SFR1Z (ZZ)	.1094	.234	.031	28	10	121
SFR133SD503	.0625	.226	.018	- -	-	-	-	35	14	109
SFR1-4	.0937	.296	.023	SFR1-4Z (ZZ)	.1406	.296	.031	35	12	97
SFR144SD513	.0625	.296	.018	- -	-	-	-	53	22	79
-	-	-	-	SFR144ZZSD516	.0937	.296	.018	53	22	79
-	-	-	-	- -	-	-	-	29	10	98
-	-	-	-	- -	-	-	-	35	12	97
-	-	-	-	- -	-	-	-	44	17	68
SFR133	.0625	.234	.018	SR133Z (ZZ)	.0937	.234	.031	19	6	109
-	-	-	-	- -	-	-	-	30	11	79
-	-	-	-	- -	-	-	-	33	12	79
-	-	-	-	- -	-	-	-	21	7	109
-	-	-	-	- -	-	-	-	21	8	109
-	-	-	-	- -	-	-	-	19	6	109
SFR1-5	.1094	.359	.023	SFR1-5Z (ZZ)	.1406	.359	.031	60	22	68
-	-	-	-	- -	-	-	-	60	22	68
-	-	-	-	- -	-	-	-	30	11	79
-	-	-	-	- -	-	-	-	60	22	68
-	-	-	-	- -	-	-	-	30	11	79
-	-	-	-	- -	-	-	-	21	7	89
-	-	-	-	- -	-	-	-	23	9	79
-	-	-	-	- -	-	-	-	33	12	79
SFR144	.0937	.296	.023	SFR144Z (ZZ)	.1094	.296	.031	30	11	79
-	-	-	-	- -	-	-	-	44	17	68
SFR2-5	.1094	.359	.023	SFR2-5Z (ZZ)	.1406	.359	.031	60	22	68
-	-	-	-	- -	-	-	-	23	9	79
-	-	-	-	- -	-	-	-	33	12	79
-	-	-	-	- -	-	-	-	44	17	68

INCH SERIES

Miniature - *Unflanged*



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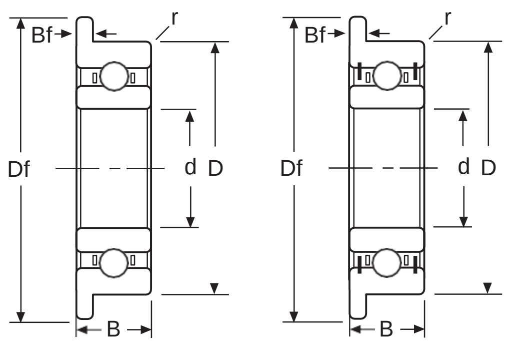
.1250	.3750	-	-	-	-	-	-	.005
.1250	.3750	**SR2-6**	.1094	**SR2-6Z**	.1094	**SR2-6ZZ**	.1406	.005
.1250	.3750	**SR2**	.1562	**SR2Z**	.1562	**SR2ZZ**	.1562	.012
.1250	.4100	-	-	**SR144ZA72**	.0937	-	-	.003
.1250	.4100	-	-	**SR2-5ZA91**	.1094	-	-	.003
.1250	.4250	-	-	**SR144ZA62**	.0937	**SR144ZZA62**	.1094	.003
.1250	.4250	-	-	**SR2-5ZA71**	.1094	-	-	.003
.1250	.4375	-	-	**SR144ZA03**	.0937	**SR144ZZA0304**	.0937	.003
.1250	.4500	**SR2-5A62**	.1094	-	-	-	-	.003
.1250	.5000	**SR2-5A03**	.1094	-	-	-	-	.003
.1250	.5000	-	-	-	-	**SR2-5ZZA0305**	.1094	.003
.1250	.5000	-	-	-	-	**SR2ZZA01**	.1562	.012
.1250	.5000	-	-	**SR188ZSD524**	.1250	-	-	.005
.1250	.5000	**SR2A**	.1719	**SR2AZ**	.1719	**SR2AZZ**	.1719	.012
.1250	.5769	-	-	-	-	**SR166ZZSD510**	.1250	.003
.1250	.7500	-	-	-	-	**SR166ZZSD509**	.1250	.003
.1250	.7500	**SSRI-1218**	.1250	**SSRI-1218Z**	.1250	**SSRI-1218ZZ**	.1250	.010
.1562	.3125	**SR155**	.1094	**SR155Z**	.1094	**SR155ZZ**	.1250	.003
.1562	.3750	-	-	-	-	**SR2ZZ513**	.1562	.012
.1562	.4100	-	-	-	-	-	-	.003
.1567	.3750	-	-	-	-	**SR166ZZSD508**	.1250	.003
.1567	.3750	-	-	-	-	**SR2ZZSD502**	.1562	.012
.1875	.3125	-	-	**SR156XZ**	.1094	**SR156XZZ**	.1094	.003
.1875	.3125	**SR156**	.1094	**SR156Z**	.1094	**SR156ZZ**	.1250	.003
.1875	.3750	-	-	-	-	**SR156XZZA0105**	.1094	.003
.1875	.3750	-	-	**SR166XZY05**	.1094	-	-	.003
.1875	.3750	**SR166**	.1250	**SR166Z**	.1250	**SR166ZZ**	.1250	.003
.1875	.4100	-	-	**SR156ZA91**	.1094	-	-	.003
.1875	.4250	-	-	**SR156ZA71**	.1094	**SR156ZZA71**	.1250	.003
.1875	.4375	-	-	-	-	**SR156XZZA0205**	.1094	.003
.1875	.4600	-	-	**SR166ZA6105**	.1094	-	-	.003
.1875	.5000	-		**SR166ZA0205**	.1094	-	-	.003
.1875	.5000	-	-	-	.1094	**SR166ZZA0208**	.1562	.012
.1875	.5000	-	-	-	-	**SR156ZZA03**	.1250	.003
.1875	.5000	-	-	-	-	**SR3ZZY08**	.1562	.012
.1875	.5000	-	-	-	-	-	-	.005
.1875	.5000	**SR3**	.1562	**SR3Z**	.1960	**SR3ZZ**	.1960	.012

Miniature - *Flanged*



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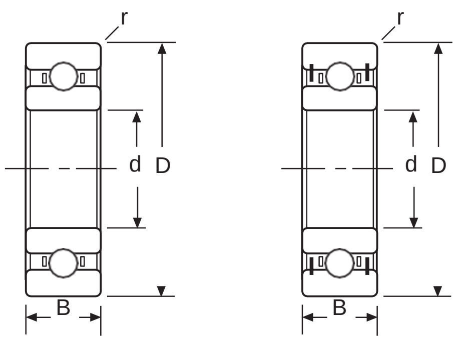
					1 or 2 Shields			DYN.	STATIC	
SFR2-6SD504	.1094	.412	.023	**SFR2-6ZSD09**	.1406	.500	.040	60	22	68
SFR2-6	.1094	.422	.023	**SFR2-6Z (ZZ)**	.1406	.422	.031	60	22	68
SFR2	.1562	.440	.030	**SFR2Z (ZZ)**	.1562	.440	.030	66	26	61
-	-	-	-	- -	-	-	-	30	11	79
SFR2-5A91	.1094	.438	.023	- -	-	-	-	60	22	68
-	-	-	-	- -	-	-	-	30	11	79
-	-	-	-	- -	-	-	-	60	22	68
-	-	-	-	-	-	-	-	33	12	79
-	-	-	-	- -	-	-	-	60	22	68
-	-	-	-	- -	-	-	-	60	22	68
-	-	-	-	- -	-	-	-	44	17	68
-	-	-	-	- -	-	-	-	66	26	61
-	-	-	-	**SFR188ZSD504**	.1875	.547	.023	88	40	40
-	-	-	-	- -	-	-	-	66	26	61
-	-	-	-	- -	-	-	-	76	31	54
-	-	-	-	- -	-	-	-	76	31	54
-	-	-	-	- -	-	-	-	76	30	56
SFR155	.1094	.359	.023	**SFR155Z (ZZ)**	.1250	.359	.036	41	15	61
-	-	-	-	- -	-	-	-	66	26	61
SFR155A91	.1094	.438	.023	- -	-	-	-	41	15	61
-	-	-	-	- -	-	-	-	76	31	54
-	-	-	-	- -	-	-	-	66	26	61
-	-	-	-	- -	-	-	-	40	17	61
SFR156	.1094	.359	.023	**SFR156Z (ZZ)**	.1250	.359	.036	41	15	61
-	-	-	-	- -	-	-	-	39	17	61
-	-	-	-	- -	-	-	-	41	15	61
SFR166	.1250	.422	.023	**SFR166Z (ZZ)**	.1250	.422	.031	76	31	54
-	-	-	-	- -	-	-	-	41	15	61
-	-	-	-	- -	-	-	-	45	17	61
-	-	-	-	- -	-	-	-	40	17	61
-	-	-	-	- -	-	-	-	76	31	54
-	-	-	-	- -	-	-	-	76	31	54
-	-	-	-	- -	-	-	-	76	31	54
-	-	-	-	- -	-	-	-	41	15	61
-	-	-	-	- -	-	-	-	112	49	43
-	-	-	-	**SFR188ZSD503**	.1875	.547	.023	88	40	40
SFR3	.1562	.565	.042	**SFR3Z (ZZ)**	.1960	.565	.042	140	59	44

INCH SERIES

Miniature - *Unflanged*



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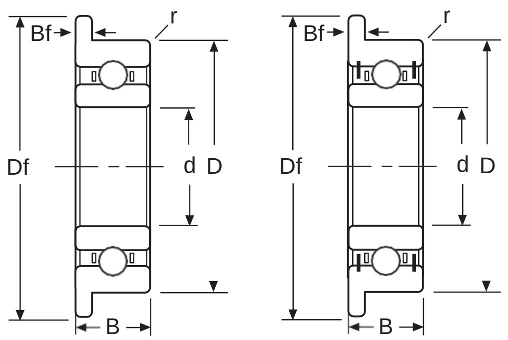
.1875	.5000	-	-	-	-	SR3ZZW20	.3125	.012
.1875	.6250	SR3A	.1960	SR3AZ	.1960	SR3AZZ	.1960	.012
.1875	.7435	-	-	SR3ZA42	.1960	SR3ZZ42	.1960	.012
.1875	.7500	-	-	SR3ZA02	.1960	SR3ZZ02	.1960	.012
.1875	.7717	-	-	SR3ZA62	.1960	SR3ZZ62	.1960	.012
.1875	.8750	-	-	SR3ZA03	.1960	SR3ZZA03	.1960	.012
.2500	.3750	SR168Y05	.1094	-	-	-	-	.003
.2500	.3750	SR168	.1250	SR168Z	.1250	SR168ZZ	.1250	.003
.2500	.4375	-	-	-	-	SR168ZZA01	.1250	.003
.2500	.5000	-	-	SR168ZA0205	.1094	-	-	.003
.2500	.5000	-	-	-	-	SR1810ZZ502	.1562	.005
.2500	.5000	SR188	.1250	SR188Z	.1250	SR188ZZ	.1875	.005
.2500	.6250	SR4	.1960	SR4Z	.1960	SR4ZZ	.1960	.012
.2500	.6250	-	-	SR4ZSD548	.3120	SR4ZZSD548	.3120	.012
.2500	.7050	-	-	SR4ZSD561	.1960	SR4ZZSD561	.1960	.012
.2500	.7500	-	-	SR4ZA01	.1960	SR4ZZA01	.1960	.012
.2500	.7500	SR4A	.2188	SR4AZ	.2812	SR4AZZ	.2812	.016
.2500	.8685	-	-	-	-	SR4ZZA12	.1960	.012
.2500	1.0415	-	-	-	-	SR4ZZA63	.1960	.012
.3125	.5000	SR1810	.1562	SR1810Z	.1562	SR1810ZZ	.1562	.005
.3125	.6250	-	-	-		SR1810ZZA02	.1562	.005
.3750	.6250	SR620Y06	.1250	-	-	-	-	.010
.3750	.6250	SR620	.1562	SR620Z	.1562	SR620ZZ	.1562	.010
.3750	.8750	SR6	.2188	SR6Z	.2812	SR6ZZ	.2812	.016
.3750	.8750	-	-	-	-	-	-	.016
.3750	1.0000	-	-	-	-	SR6ZZA02	.2812	.016
.5000	.7500	SR824	.1562	SR824Z	.1562	SR824ZZ	.1562	.010
.5000	.8750	SR6-5	.2188	SR6-5Z	.2812	SR6-5ZZ	.2812	.016
.5000	1.1250	SR8	.2500	SR8Z	.3125	SR8ZZ	.3125	.016
.6250	.8750	SR1028	.1562	SR1028Z	.1562	SR1028ZZ	.1562	.010
.7500	1.0000	SR1232	.1562	SR1232Z	.1562	SR1232ZZ	.1562	.010
.8750	1.1250	SR1436	.1562	SR1436Z	.1562	SR1436ZZ	.1562	.010

INCH SERIES

Miniature - Flanged



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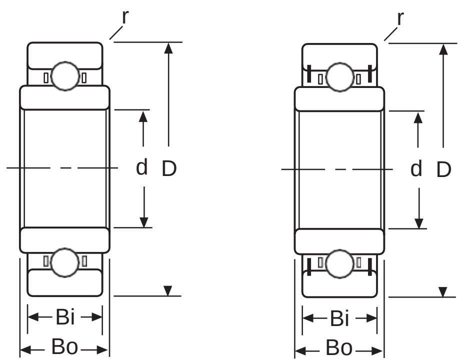
-	-	-	-	- -	-	-	-	140	59	44
-	-	-	-	- -	-	-	-	140	59	44
-	-	-	-	- -	-	-	-	140	59	44
-	-	-	-	- -	-	-	-	140	59	44
-	-	-	-	- -	-	-	-	140	59	44
-	-	-	-	- -	-	-	-	140	59	44
-	-	-	-	- -	-	-	-	43	21	48
SFR168	.1250	.422	.023	SFR168Z (ZZ)	.1250	.422	.036	43	21	48
-	-	-	-	- -	-	-	-	43	21	48
-	-	-	-	- -	-	-	-	43	21	48
-	-	-	-	SFR1810ZZ502	.1562	.547	.042	93	43	37
SFR188	.1250	.547	.023	SFR188Z (ZZ)	.1875	.547	.045	88	40	40
SFR4	.1960	.690	.042	SFR4Z (ZZ)	.1960	.690	.042	159	70	35
-	-	-	-	- -	-	-	-	159	70	35
-	-	-	-	- -	-	-	-	159	70	35
-	-	-	-	- -	-	-	-	159	70	35
-	-	-	-	- -	-	-	-	412	193	31
-	-	-	-	- -	-	-	-	159	70	35
-	-	-	-	- -	-	-	-	159	70	35
SFR1810	.1562	.547	.031	SFR1810Z (ZZ)	.1562	.547	.031	93	43	37
-	-	-	-	- -	-	-	-	93	43	37
-	-	-	-	- -	-	-	-	95	49	30
-	-	-	-	- -	-	-	-	96	53	30
SFR6	.2812	.969	.062	SFR6Z (ZZ)	.2812	.969	.062	569	273	24
SFR6SD503	.2188	.969	.062	- -	-	-	-	569	273	24
-	-	-	-	- -	-	-	-	569	273	24
-	-	-	-	- -	-	-	-	111	71	24
-	-	-	-	- -	-	-	-	198	110	22
SFR8	.2500	1.225	.062	SFR8Z (ZZ)	.3125	1.225	.062	684	344	19
-	-	-	-	- -	-	-	-	116	81	20
-	-	-	-	- -	-	-	-	127	99	17
-	-	-	-	- -	-	-	-	189	161	15

Miniature - *Unflanged - Extended Inner Ring*

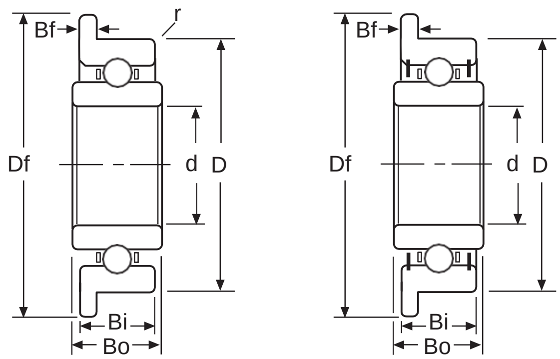


Notes:
1. Basic numbers shown include code "S" for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the "S" prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.

BORE d	O.D. D	IBSCO NUMBER OPEN	WIDTH INNER Bi	WIDTH OUTER Bo	IBSCO NUMBER 2 SHIELDS	WIDTH INNER Bi	WIDTH OUTER Bo	LOAD RATINGS Lbs. DYN.	LOAD RATINGS Lbs. STATIC	FILLET RADIUS r
.0400	.1250	**SR09EE**	.0781	.0469	-	-	-	9	3	.003
.0469	.1562	**SR0EE**	.0937	.0625	**SR0ZZEE**	.1250	.0937	16	5	.003
.0550	.1875	**SR1EE**	.1094	.0781	**SR1ZZEE**	.1406	.1094	28	10	.003
.0781	.2500	**SR1-4EE**	.1250	.0937	**SR1-4ZZEE**	.1719	.1406	35	12	.003
.0937	.1875	**SR133EE**	.0937	.0625	**SR133ZZEE**	.1250	.0937	19	6	.003
.0937	.3125	**SR1-5**	.1406	.1094	**SR1-5ZZEE**	.1719	.1406	60	22	.003
.1250	.2500	**SR144EE**	.1250	.0937	**SR144ZZEE**	.1406	.1094	30	11	.003
.1250	.3125	**SR2-5EE**	.1406	.1094	**SR2-5ZZEE**	.1719	.1406	60	22	.003
.1250	.3750	**SR2-6EE**	.1406	.1094	**SR2-6ZZEE**	.1719	.1406	60	22	.005
.1250	.3750	**SR2EE**	.1875	.1562	**SR2ZZEE**	.1875	.1562	66	26	.012
.1562	.3125	**SR155EE**	.1406	.1094	**SR155ZZEE**	.1562	.1250	41	15	.003
.1875	.3125	**SR156EE**	.1406	.1094	**SR156ZZEE**	.1562	.1250	41	15	.003
.1875	.3750	**SR166EE**	.1562	.1250	**SR166ZZEE**	.1562	.1250	76	31	.003
.1875	.5000	**SR3EE**	-	-	**SR3ZZEE**	.2272	.1960	140	59	.012
.2500	.3750	**SR168EE**	.1562	.1250	**SR168ZZEE**	.1562	.1250	43	21	.003
.2500	.5000	**SR188EE**	.1562	.1250	**SR188ZZEE**	.2188	.1875	88	40	.005
.2500	.6250	**SR4EE**	.2260	.1960	**SR4ZZEE**	.2260	.1960	159	70	.012
.3125	.5000	**SR1810EE**	.1875	.1562	**SR1810ZZEE**	.1875	.1562	93	43	.005

INCH SERIES

Miniature - Flanged - Extended Inner Ring



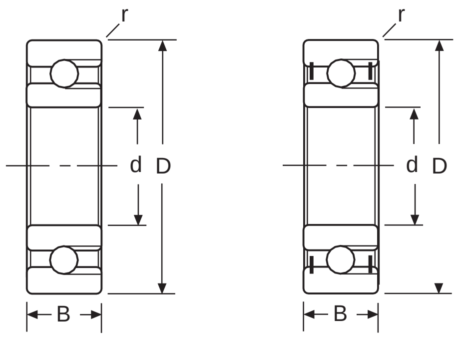
Notes:

1. Basic numbers shown include code “S” for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the “S” prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.

IBSCO NUMBER OPEN	WIDTH INNER Bi	WIDTH OUTER Bo	FLANGE DIA. Df	FLANGE WIDTH Bf	IBSCO NUMBER SHIELDED	WIDTH INNER Bi	WIDTH OUTER Bo	FLANGE DIA. Df	FLANGE WIDTH Bf	$N_{max} \mid f_n$ rpm/1000
SFR09EE	.0781	.0469	.171	.013	-	-	-	-	-	192
SFR0EE	.0937	.0625	.203	.013	**SFR0ZZEE**	.1250	.0937	.203	.031	149
SFR1EE	.1094	.0781	.234	.023	**SFR1ZZEE**	.1406	.1094	.234	.031	121
SFR1-4EE	.1250	.0937	.296	.023	**SFR1-4ZZEE**	.1719	.1406	.296	.031	97
SFR133EE	.0937	.0625	.234	.018	**SFR133ZZEE**	.1250	.0937	.234	.031	109
SFR1-5EE	.1406	.1094	.359	.023	**SFR1-5ZZEE**	.1719	.1406	.359	.031	68
SFR144EE	.1250	.0937	.296	.023	**SFR144ZZEE**	.1406	.1094	.296	.031	79
SFR2-5EE	.1406	.1094	.359	.023	**SFR2-5ZZEE**	.1719	.1406	.359	.031	68
SFR2-6EE	.1406	.1094	.422	.023	**SFR2-6ZZEE**	.1719	.1406	.422	.031	68
SFR2EE	.1875	.1562	.440	.030	**SFR2ZZEE**	.1875	.1562	.440	.030	61
SFR155EE	.1406	.1094	.359	.023	**SFR155ZZEE**	.1562	.1250	.359	.036	61
SFR156EE	.1406	.1094	.359	.023	**SFR156ZZEE**	.1562	.1250	.359	.036	61
SFR166EE	.1562	.1250	.422	.023	**SFR166ZZEE**	.1562	.1250	.422	.031	54
SFR3EE	.2272	.1960	.565	.042	**SFR3ZZEE**	.2272	.1960	.565	.042	44
SFR168EE	.1562	.1250	.422	.023	**SFR168ZZEE**	.1562	.1250	.422	.036	48
SFR188EE	.1562	.1250	.547	.023	**SFR188ZZEE**	.2188	.1875	.547	.045	40
SFR4EE	.2260	.1960	.690	.042	**SFR4ZZEE**	.2260	.1960	.690	.042	35
SFR1810EE	.1875	.1562	.547	.031	**SFR1810ZZEE**	.1875	.1562	.547	.031	37

INCH SERIES

Miniature - Unflanged - Full Compliment

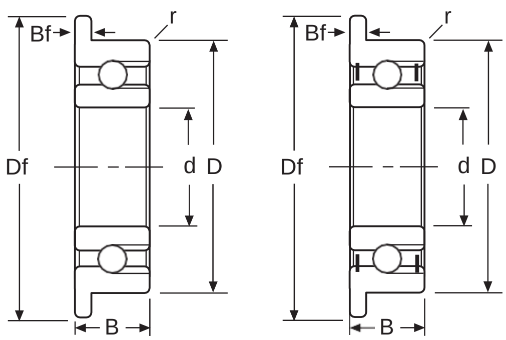


Notes:

1. Basic numbers shown include code “S” for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the “S” prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.

BORE b	O.D. D	IBSCO NUMBER OPEN	WIDTH B	IBSCO NUMBER 1 SHIELD	WIDTH B1	IBSCO NUMBER 2 SHIELDS	WIDTH B2	FILLET RADIUS r
.0469	.1562	**SR0F**	.0625	**SR0ZF**	.0937	**SR0ZZF**	.0937	.003
.0550	.1875	**SR1F**	.0781	**SR1ZF**	.1094	**SR1ZZF**	.1094	.003
.0781	.2362	**SR1-4SD508F**	.0937	-	-	-	-	.003
.0781	.2500	**SR1-4F**	.0937	**SR1-4ZF**	.1406	**SR1-4ZZF**	.1406	.003
.0937	.1875	**SR133F**	.0625	**SR133ZF**	.0937	**SR133ZZF**	.0937	.003
.0937	.3125	**SR1-5SD507F**	.1094	**SR1-5ZF**	.1094	**SR1-5ZZF**	.1094	.003
.1250	.2500	**SR144F**	.0937	**SR144ZF**	.1094	**SR144ZZF**	.1094	.003
.1250	.3125	**SR2-5F**	.1094	**SR2-5ZF**	.1406	**SR2-5ZZF**	.1406	.003
.1250	.3750	**SR2-6F**	.1094	**SR2-6ZF**	.1406	**SR2-6ZZF**	.1406	.005
.1250	.3750	**SR2F**	.1562	**SR2ZF**	.1562	**SR2ZZF**	.1562	.012
.1562	.3125	**SR155F**	.1094	**SR155ZF**	.1250	**SR155ZZF**	.1250	.003
.1875	.3125	**SR156F**	.1094	**SR156ZF**	.1250	**SR156ZZF**	.1250	.003
.1875	.3750	**SR166F**	.1250	**SR166ZF**	.1250	**SR166ZZF**	.1250	.003
.1875	.5000	**SR3F**	.1562	**SR3ZF**	.1960	**SR3ZZF**	.1960	.012
.2500	.3750	**SR168F**	.1250	**SR168ZF**	.1250	**SR168ZZF**	.1250	.003
.2500	.5000	**SR188F**	.1250	**SR188ZF**	.1250	**SR188ZZF**	.1875	.005
.2500	.6250	**SR4F**	.1960	**SR4ZF**	.1960	**SR4ZZF**	.1960	.012
.2500	.7500	**SR4AF**	.2188	**SR4AZF**	.2812	**SR4AZZF**	.2812	.016
.3125	.5000	**SR1810F**	.1562	**SR1810ZF**	.1562	**SR1810ZZF**	.1562	.005
.3750	.8750	**SR6F**	.2188	**SR6ZF**	.2812	**SR6ZZF**	.2812	.016
.5000	.8750	**SR6-5F**	.2188	**SR6-5ZF**	.2812	**SR6-5ZZF**	.2812	.016

Miniature - Flanged - Full Compliment

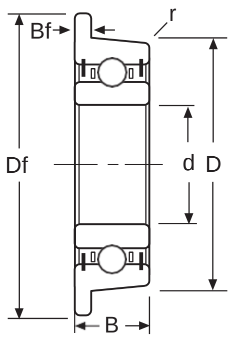


Notes:

1. Basic numbers shown include code “S” for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the “S” prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.

IBSCO NUMBER OPEN	WIDTH B	FLANGE DIA. (Df)	FLANGE WIDTH (Bf)	IBSCO NUMBER SHIELDED	WIDTH B 1 or 2 Shields	FLANGE DIA. (Df)	FLANGE WIDTH (Bf)	LOAD RATINGS Lbs DYN.	LOAD RATINGS Lbs STATIC	Nmax fn rpm/1000
SFR0F	.0625	.203	.031	**SFR0ZZF**	.0937	.203	.031	22	9	60
SFR1F	.0781	.234	.031	**SFR1ZZF**	.1094	.234	.031	38	15	48
-	-	-	-	**-**	-	-	-	49	20	39
SFR1-4F	.0937	.296	.023	**SFR1-4ZZF**	.1406	.296	.031	49	20	39
-	-	-	-	**SFR133ZZF**	.0937	.234	.031	33	14	44
SFR1-5F	.1094	.359	.023	**SFR1-5ZZF**	.1406	.359	.031	102	47	27
SFR144F	.0937	.296	.023	**SFR144ZZF**	.1094	.296	.031	50	23	31
SFR2-5F	.1094	.359	.023	**SFR2-5ZZF**	.1406	.359	.031	102	47	27
SFR2-6F	.1094	.422	.023	**SFR2-6ZZF**	.1406	.422	.031	102	47	27
SFR2F	.1562	.440	.030	**SFR2ZZF**	.1562	.440	.030	95	45	24
SFR155F	.1094	.359	.023	**SFR155ZZF**	.1250	.359	.036	72	34	24
SFR156F	.1094	.359	.023	**SFR156ZZF**	.1250	.359	.036	72	34	22
SFR166F	.1250	.422	.023	**SFR166ZZF**	.1250	.422	.031	105	50	22
SFR3F	.1562	.565	.042	**SFR3ZZF**	.1960	.565	.042	190	93	18
SFR168F	.1250	.422	.023	**SFR168ZZF**	.1250	.422	.036	65	39	19
SFR188F	.1250	.547	.023	**SFR188ZZF**	.1875	.547	.045	126	71	16
SFR4F	.1960	.690	.042	**SFR4ZZF**	.1960	.690	.042	231	123	14
-	-	-	-	**-**	-	-	-	576	322	12
SFR1810F	.1562	.547	.031	**SFR1810ZZF**	.1562	.547	.031	139	78	15
-	-	-	-	**SFR6ZZF**	.2812	.969	.062	778	470	10
-	-	-	-	**-**	-	-	-	297	201	9

Miniature - *Flanged - Tapered O.D.*



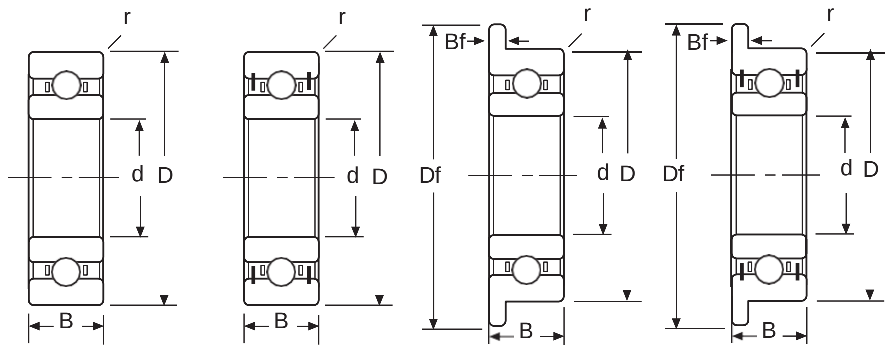
Notes:

1. Basic numbers shown include code “S” for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the “S” prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.
4. Bore dimensions +.0002, -.0000
5. O.D. taper = .068 in/ft

BORE d	O.D. D	WIDTH INNER Bi	WIDTH OUTER Bo	IBSCO NUMBER 2 SHIELDS	FLANGE INNER Df	FLANGE OUTER Bf	FILLET RADIUS r	LOAD RATINGS Lbs.		N_{max}|f_n rpm/1000
								DYN.	STATIC	
.1250	.3757	.1880	.1630	**SF2ZZ**	.438	.037	.012	66	26	61
.1875	.5632	.2500	.2260	**SF3ZZ**	.625	.042	.012	140	59	44
.2500	.6257	.2500	.2260	**SF4ZZ**	.687	.042	.012	159	70	35
.3125	.6882	.2500	.2260	**SF5ZZ**	.750	.042	.012	381	174	30

INCH SERIES

“R” Series



Notes:

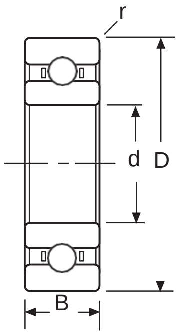
1. Basic numbers shown include code “S” for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the “S” prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.
4. Load ratings shown are for chrome steel.

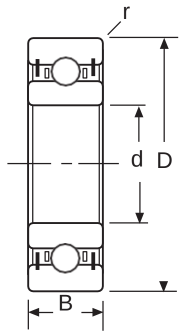
* Width for open flanged bearing = .2812

BORE d	O.D. D	WIDTH OPEN B	WIDTH SHIELDED B	IBSCO NUMBER OPEN	IBSCO NUMBER SHIELDED	FLANGE O.D. Df	FLANGE WIDTH Bf	FILLET RADIUS r	LOAD RATINGS Lbs. DYN.	STATIC
.1250	.3750	.1562	.1562	**SR2**	**SR2ZZ**	.440	.030	.012	66	26
.1250	.5000	.1719	.1719	**SR2A**	**SR2AZZ**	-	-	.012	66	26
.1875	.5000	.1562	.1960	**SR3**	**SR3ZZ**	.565	.042	.012	140	59
.1875	.6250	.1960	.1960	**SR3A**	**SR3AZZ**	-	-	.012	140	59
.2500	.6250	.1960	.1960	**SR4**	**SR4ZZ**	.690	.042	.012	159	70
.2500	.7500	.2188	.2812	**SR4A**	**SR4AZZ**	-	-	.016	412	193
.3750	.8750	*.2188	.2812	**SR6**	**SR6ZZ**	.969	.062	.016	569	273
.5000	.8750	.2188	.2812	**SR6-5**	**SR6-5ZZ**	-	-	.016	198	110
.5000	1.1250	.2500	.3125	**SR8**	**SR8ZZ**	1.225	.062	.016	684	344
.6250	1.3750	.2812	.3438	**SR10**	**SR10ZZ**	-	-	.031	1374	734
.7500	1.6250	.3125	.4375	**SR12**	**SR12ZZ**	-	-	.031	2110	1151
.8750	1.8750	.3750	.5000	**SR14**	**SR14ZZ**	-	-	.031	2262	1318
1.0000	2.0000	.3750	.5000	**SR16**	**SR16ZZ**	-	-	.031	2262	1318
1.1250	2.1250	.3750	.5000	**SR18**	**SR18ZZ**	-	-	.031	2974	1858
1.2500	2.2500	.3750	.5000	**SR20**	**SR20ZZ**	-	-	.31	2974	1858
1.3750	2.5000	.4375	.5625	**R22**	**R22ZZ**	-	-	.031	3589	2315
1.5000	2.6250	.4375	.5625	**R24**	**R24ZZ**	-	-	.031	3770	2595

METRIC SERIES

Miniature - *Unflanged*





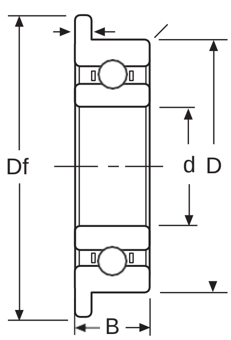
Notes:

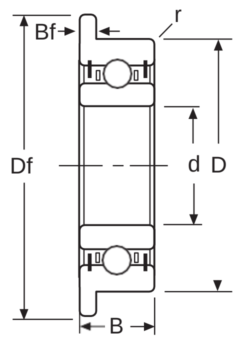
1. Basic numbers shown include code “S” for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the “S” prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.
4. Inch dimensions for reference only.

BORE d		O.D. D		WIDTH B		IBSCO NUMBER	IBSCO NUMBER	WIDTH B		FILLET RADIUS		Standard Reference
MM	INCH	MM	INCH	MM	INCH	OPEN	SHIELDED	MM	INCH	MM	INCH	
1.0	.0394	**3.0**	.1181	**1.0**	.0394	**SL310**	**-**	**-**	-	0.05	.002	**681**
1.0	.0394	**3.0**	.1181	**1.5**	.0591	**SL310W51**	**-**	**-**	-	0.05	.002	**MR31**
1.0	.0394	**4.0**	.1575	**1.6**	.0630	**SL410**	**-**	**-**	-	0.10	.004	**691**
1.2	.0472	**4.0**	.1575	**1.8**	.0709	**SR412**	**SR412ZZ**	**2.5**	.0984	0.05	.002	**MR41X**
1.5	.0591	**4.0**	.1575	**1.2**	.0472	**SL415**	**SL415ZZ**	**2.0**	.0787	0.05	.002	**681X**
1.5	.0591	**5.0**	.1969	**2.0**	.0787	**SR515**	**SR515ZZ**	**2.6**	.1024	0.15	.006	**691X**
1.5	.0591	**6.0**	.2362	**2.5**	.0984	**SR615**	**SR615ZZ**	**3.0**	.1181	0.15	.006	**601X**
2.0	.0787	**5.0**	.1969	**1.5**	.0591	**SL520**	**SL520ZZ**	**2.3**	.0906	0.08	.003	**682**
2.0	.0787	**5.0**	.1969	**2.0**	.0787	**SL520W02**	**SL520ZZW52**	**2.5**	.0984	0.10	.004	**MR52**
2.0	.0787	**6.0**	.2362	**2.3**	.0906	**SR620M**	**SR620MZZ**	**3.0**	.1181	0.15	.006	**692**
2.0	.0787	**6.0**	.2362	**2.5**	.0984	**SR620W52**	**SR620ZZY52**	**2.5**	.0984	0.15	.006	**MR62**
2.0	.0787	**7.0**	.2756	**2.5**	.0984	**SR720Y52**	**SR720ZZY03**	**3.0**	.1181	0.15	.006	**MR72**
2.0	.0787	**7.0**	.2756	**2.8**	.1102	**SR720**	**SR720ZZ**	**3.5**	.1378	0.08	.003	**602**
2.5	.0984	**6.0**	.2362	**1.8**	.0709	**SL625**	**SL625ZZ**	**2.6**	.1024	0.08	.003	**682X**
2.5	.0984	**7.0**	.2756	**2.5**	.0984	**SR725**	**SR725ZZ**	**3.5**	.1378	0.15	.006	**692X**
2.5	.0984	**8.0**	.3150	**2.5**	.0984	**SR825Y52**	**-**	**-**	-	0.20	.008	**MR82X**
2.5	.0984	**8.0**	.3150	**2.8**	.1102	**SR825**	**SR825ZZ**	**4.0**	.1575	0.15	.006	**602X**
3.0	.1181	**6.0**	.2362	**2.0**	.0787	**SL630**	**SL630ZZ**	**2.5**	.0984	0.08	.003	**MR63**
3.0	.1181	**7.0**	.2756	**2.0**	.0787	**SL730**	**SL730ZZ**	**3.0**	.1181	0.10	.004	**683**
3.0	.1181	**8.0**	.3150	**2.5**	.0984	**SR830Y52**	**SR830ZZY03**	**3.0**	.1181	0.15	.006	**MR83**
3.0	.1181	**8.0**	.3150	**3.0**	.1181	**SR830**	**SR830ZZ**	**4.0**	.1575	0.15	.006	**693**
3.0	.1181	**9.0**	.3543	**2.5**	.0984	**SR930Y52**	**SR930ZZY04**	**4.0**	.1575	0.20	.008	**MR93**
3.0	.1181	**9.0**	.3543	**3.0**	.1181	**SR930**	**SR930ZZ**	**5.0**	.1969	0.15	.006	**603**
3.0	.1181	**10.0**	.3937	**4.0**	.1575	**SR1030**	**SR1030ZZ**	**4.0**	.1575	0.15	.006	**623**
3.0	.1181	**13.0**	.5118	**5.0**	.1969	**SR1330**	**SR1330ZZ**	**5.0**	.1181	0.08	.003	**633**
4.0	.1575	**7.0**	.2756	**2.0**	.0787	**SL740**	**SL740ZZ**	**2.5**	.0984	0.08	.003	**674**
4.0	.1575	**8.0**	.3150	**2.0**	.0787	**SL840**	**SL840ZZ**	**3.0**	.1181	0.10	.004	**MR84**
4.0	.1575	**9.0**	.3543	**2.5**	.0984	**SL940**	**SL940ZZ**	**4.0**	.1575	0.10	.004	**684**
4.0	.1575	**10.0**	.3937	**3.0**	.1181	**SL1040**	**SL1040ZZ**	**4.0**	.1575	0.15	.006	**MR104**
4.0	.1575	**11.0**	.4331	**4.0**	.1575	**SR1140**	**SR1140ZZ**	**4.0**	.1575	0.15	.006	**694**
4.0	.1575	**12.0**	.4724	**4.0**	.1575	**SR1240**	**SR1240ZZ**	**4.0**	.1575	0.20	.008	**604**
4.0	.1575	**13.0**	.5118	**5.0**	.1969	**SR1340**	**SR1340ZZ**	**5.0**	.1969	0.20	.008	**624**
4.0	.1575	**16.0**	.6299	**5.0**	.1969	**SR1640**	**SR1640ZZ**	**5.0**	.1969	.030	.012	**634**

METRIC SERIES

Miniature - Flanged





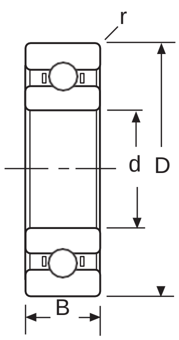
Notes:

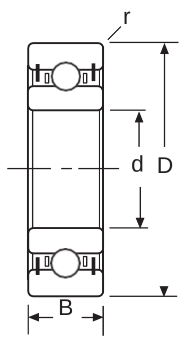
1. Basic numbers shown include code “S” for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the “S” prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.
4. Inch dimensions for reference only.

IBSCO NUMBER OPEN	FLANGE DIA. (D_f)		FLANGE WIDTH (B_f)		IBSCO NUMBER SHIELDED	FLANGE DIA. (D_f)		FLANGE WIDTH (B_f)		LOAD RATING (Kgs.)		N_{max} f_n rpm/1000
	MM	INCH	MM	INCH		MM	INCH	MM	INCH	DYN	STATIC	
SLF310	3.8	.1496	0.3	.012	-	-	-	-	-	9	3	193
SLF310W51	3.8	.1496	0.3	.012	-	-	-	-	-	9	3	193
SLF410	5.0	.1969	0.5	.020	-	-	-	-	-	14	4	120
SRF412	4.8	.1890	0.4	.016	-	-	-	-	-	8.5	3	149
SLF415	5.0	.1969	0.4	.016	SLF415ZZ	5.0	.1969	0.6	.024	13	4	140
SRF515	6.5	.2559	0.6	.024	SRF515ZZ	6.5	.2559	0.8	.032	19	6	123
SRF615	7.5	.2953	0.6	.024	SRF615ZZ	7.5	.2953	0.8	.032	34	10	102
SLF520	6.1	.2401	0.5	.020	SLF520ZZ	6.1	.2401	0.6	.024	19	6	112
SLF520W02	6.2	.2440	0.6	.024	SLF520ZZW52	6.2	.2440	0.6	.024	13	4.5	112
SRF620M	7.5	.2953	0.6	.024	SRF620MZZ	7.5	.2953	0.8	.032	29	9	98
SRF620W52	7.2	.2835	0.6	.024	-	-	-	-	-	33	10	97
SRF720Y52	8.2	.3228	0.6	.024	SRF720ZZY03	8.2	.3228	0.6	.024	39	13	83
SRF720	8.5	.3346	0.7	.028	SRF720ZZ	8.5	.3346	0.9	.035	39	13	83
SLF625	7.1	.2795	0.5	.020	SLF625ZZ	7.1	.2795	0.8	.032	21	8	89
SRF725	8.5	.3346	0.7	.028	SRF725ZZ	8.5	.3346	0.9	.035	39	13	83
SRF825Y52	9.2	.3622	0.6	.024	-	-	-	-	-	43	19	73
SRF825	9.5	.3740	0.7	.028	SRF825ZZ	9.5	.3740	0.9	.035	57	18	73
SLF630	7.2	.2835	0.6	.024	SLF630ZZ	7.2	.2835	0.6	.024	21	8	89
SLF730	8.1	.3189	0.5	.020	SLF730ZZ	8.1	.3189	0.8	.032	40	14	78
SRF830Y52	9.2	.3622	0.6	.024	-	-	-	-	-	43	19	73
SRF830	9.5	.3740	0.7	.028	SRF830ZZ	9.5	.3740	0.9	.035	57	18	73
SRF930Y52	10.2	.4016	0.6	.024	SRF930ZZY04	10.2	.4016	0.8	.032	44	19	64
SRF930	10.5	.4134	0.7	.028	SRF930ZZ	10.5	.4134	1.0	.039	65	23	64
SRF1030	11.5	.4528	1.0	.039	SRF1030ZZ	11.5	.4528	1.0	.039	66	23	61
-	-	-	-	-	-	-	-	-	-	132	49	48
SLF740	8.2	.3228	0.6	.024	SLF740ZZ	8.2	.3228	0.6	.024	26	11	72
SLF840	9.2	.3622	0.6	.024	SLF840ZZ	9.2	.3622	0.6	.024	40	15	64
SLF940	10.3	.4055	0.6	.024	SLF940ZZ	10.3	.4055	1.0	.039	66	23	61
SLF1040	11.2	.4409	0.6	.024	SLF1040ZZ	11.6	.4567	0.8	.032	73	27	54
SRF1140	12.5	.4921	1.0	.039	SRF1140ZZ	12.5	.4921	1.0	.039	73	29	52
SRF1240	13.5	.5315	1.0	.039	SRF1240ZZ	13.5	.5315	1.0	.039	98	37	48
SRF1340	15.0	.5906	1.0	.039	SRF1340ZZ	15.0	.5906	1.0	.039	134	50	44
SRF1640	18.0	.7087	1.0	.039	SRF1640ZZ	18.0	.7087	1.0	.039	177	69	37

METRIC SERIES

Miniature - *Unflanged*





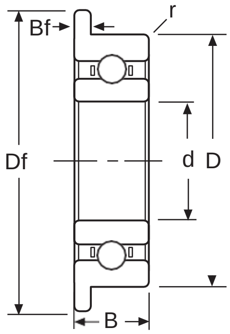
Notes:

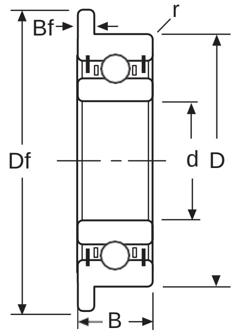
1. Basic numbers shown include code “S” for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the “S” prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.
4. Inch dimensions for reference only.

BORE d		O.D. D		WIDTH B		IBSCO NUMBER	IBSCO NUMBER	WIDTH B		FILLET RADIUS		Standard Reference
MM	INCH	MM	INCH	MM	INCH	OPEN	SHIELDED	MM	INCH	MM	INCH	
5.0	.1969	**8.0**	.3150	**2.0**	.0787	**SL850**	**SL850ZZ**	**2.5**	.0984	0.08	.003	**675**
5.0	.1969	**9.0**	.3543	**2.5**	.0984	**SL950**	**SL950ZZ**	**3.0**	.1181	0.10	.004	**MR95**
5.0	.1969	**10.0**	.3937	**3.0**	.1181	**SL1050**	**SL1050ZZ**	**4.0**	.1575	0.10	.004	**MR105**
5.0	.1969	**11.0**	.4331	**-**	-	**-**	**SL1150ZZY04**	**4.0**	.1575	0.15	.006	**MR115**
5.0	.1969	**11.0**	.4331	**3.0**	.1181	**SL1150**	**SL1150ZZ**	**5.0**	.1969	0.15	.006	**685**
5.0	.1969	**13.0**	.5118	**4.0**	.1575	**SR1350**	**SR1350ZZ**	**4.0**	.1575	0.20	.008	**695**
5.0	.1969	**14.0**	.5512	**5.0**	.1969	**SR1450**	**SR1450ZZ**	**5.0**	.1969	0.20	.008	**605**
5.0	.1969	**16.0**	.6299	**5.0**	.1969	**SR1650**	**SR1650ZZ**	**5.0**	.1969	0.30	.012	**625**
5.0	.1969	**19.0**	.7480	**6.0**	.2362	**SR1950**	**SR1950ZZ**	**6.0**	.2362	.030	.012	**635**
6.0	.2362	**10.0**	.3937	**2.5**	.0984	**SL1060**	**SL1060ZZ**	**3.0**	.1181	0.10	.004	**676**
6.0	.2362	**12.0**	.4724	**3.0**	.1181	**SL1260**	**SL1260ZZ**	**4.0**	.1575	0.15	.006	**MR126**
6.0	.2362	**13.0**	.5118	**3.5**	.1378	**SL1360**	**SL1360ZZ**	**5.0**	.1969	0.15	.006	**686**
6.0	.2362	**15.0**	.5906	**5.0**	.1969	**SR1560**	**SR1560ZZ**	**5.0**	.1969	0.15	.006	**696**
6.0	.2362	**17.0**	.6693	**6.0**	.2362	**SR1760**	**SR1760ZZ**	**6.0**	.2362	0.20	.008	**606**
6.0	.2362	**19.0**	.7480	**6.0**	.2362	**SR1960**	**SR1960ZZ**	**6.0**	.2362	0.30	.012	**626**
6.0	.2362	**22.0**	.8661	**7.0**	.2756	**SR2260**	**SR2260ZZ**	**7.0**	.2756	0.30	.012	**636**
7.0	.2756	**11.0**	.4331	**2.5**	.0984	**SL1170**	**SL1170ZZ**	**3.0**	.1181	0.10	.004	**677**
7.0	.2756	**13.0**	.5118	**3.0**	.1181	**SL1370**	**SL1370ZZ**	**4.0**	.1575	0.15	.006	**MR137**
7.0	.2756	**14.0**	.5512	**3.5**	.1378	**SL1470**	**SL1470ZZ**	**5.0**	.1969	0.15	.006	**687**
7.0	.2756	**17.0**	.6693	**5.0**	.1969	**SR1770**	**SR1770ZZ**	**5.0**	.1969	0.30	.012	**697**
7.0	.2756	**19.0**	.7480	**6.0**	.2362	**SR1970**	**SR1970ZZ**	**6.0**	.2362	0.30	.012	**607**
7.0	.2756	**22.0**	.8661	**7.0**	.2756	**SR2270**	**SR2270ZZ**	**7.0**	.2756	0.30	.012	**627**
7.0	.2756	**22.0**	.8661	**-**	-	**-**	**SR2270ZZ301**	**10.3**	.4060	0.40	.016	**37SSTX2**
8.0	.3150	**12.0**	.4724	**2.5**	.0984	**SL1280**	**SL1280ZZ**	**3.5**	.1378	0.10	.004	**678**
8.0	.3150	**14.0**	.5512	**3.5**	.1378	**SL1480**	**SL1480ZZ**	**4.0**	.1575	0.15	.006	**MR148**
8.0	.3150	**16.0**	.6299	**4.0**	.1575	**SL1680**	**SL1680ZZ**	**5.0**	.1969	0.20	.008	**688**
8.0	.3150	**16.0**	.6299	**-**	-	**-**	**SL1680ZZW06**	**6.0**	.2362	0.20	.008	
8.0	.3150	**19.0**	.7480	**6.0**	.2362	**SR1980**	**SR1980ZZ**	**6.0**	.2362	0.30	.012	**698**
8.0	.3150	**22.0**	.8661	**7.0**	.2756	**SR2280**	**SR2280ZZ**	**7.0**	.2756	0.30	.012	**608**
8.0	.3150	**22.0**	.8661	**-**	-	**-**	**SR2280ZZ301**	**10.3**	.4060	0.40	.016	**38SSTX2**
8.0	.3150	**24.0**	.9449	**8.0**	.3150	**SR2480**	**SR2480ZZ**	**8.0**	.3150	0.30	.012	**628**
8.0	.3150	**28.0**	1.1024	**9.0**	.3543	**SR2880**	**SR2880ZZ**	**9.0**	.3543	0.30	.012	**638**
9.0	.3543	**14.0**	.5512	**3.0**	.1181	**SL1490**	**SL1490ZZ**	**4.5**	.1772	0.10	.004	**679**
9.0	.3543	**17.0**	.6693	**4.0**	.1575	**SL1790**	**SL1790ZZ**	**5.0**	.1969	0.20	.008	**689**
9.0	.3543	**20.0**	.7874	**5.0**	.1960	**SL2090**	**SL2090ZZ**	**6.0**	.2362	0.30	.012	**699**
9.0	.3543	**20.0**	.7874	**6.0**	.2362	**SL2090W06**	**-**	**-**	-	0.30	.012	
9.0	.3543	**24.0**	.9449	**7.0**	.2756	**SR2490**	**SR2490ZZ**	**7.0**	.2756	0.30	.012	**609**
9.0	.3543	**26.0**	1.0236	**8.0**	.3150	**SR2690**	**SR2690ZZ**	**8.0**	.3150	0.30	.012	**629**
9.0	.3543	**30.0**	1.1811	**10.0**	.3937	**SR3090**	**SR3090ZZ**	**10.0**	.3937	0.60	.024	**639**

METRIC SERIES

Miniature - Flanged





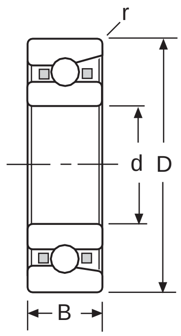
Notes:

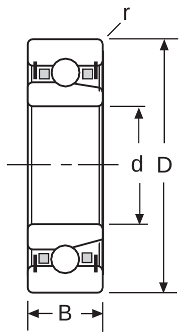
1. Basic numbers shown include code "S" for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the "S" prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.
4. Inch dimensions for reference only.

IBSCO NUMBER OPEN	FLANGE DIA. (D_f)		FLANGE WIDTH (B_f)		IBSCO NUMBER SHIELDED	FLANGE DIA. (D_f)		FLANGE WIDTH (B_f)		LOAD RATING (Kgs.)		N_{max} f_n rpm/1000
	MM	INCH	MM	INCH		MM	INCH	MM	INCH	DYN	STATIC	
SLF850	9.2	.3622	0.6	.023	**SLF850ZZ**	9.2	.3622	0.6	.023	28	14	59
SLF950	10.2	.4016	0.6	.023	**SLF950ZZ**	10.2	.4016	0.6	.023	51	21	56
SLF1050	11.2	.4409	0.6	.023	**SLF1050ZZ**	11.6	.4566	0.8	.031	73	25	52
-	-	-	-	-	**SLF1150ZZY4**	12.6	.4961	0.8	.031	73	29	48
SLF1150	12.5	.4921	0.8	.031	**SLF1150ZZ**	12.5	.4921	1.0	.039	73	29	48
SRF1350	15.0	.5906	1.0	.039	**SRF1350ZZ**	15.0	.5906	1.0	.039	110	43	44
SRF1450	16.0	.6299	1.0	.039	**SRF1450ZZ**	16.0	.6299	1.0	.039	136	52	40
SRF1650	18.0	.7087	1.0	.039	**SRF1650ZZ**	18.0	.7087	1.0	.039	177	69	36
SRF1950	22.0	.8661	1.5	.059	**SRF1950ZZ**	22.0	.8661	1.5	.059	287	109	31
SLF1060	11.2	.4409	0.6	.023	**SLF1060ZZ**	11.2	.4409	0.6	.023	47	20	49
SLF1260	13.2	.5197	0.6	.023	**SLF1260ZZ**	13.6	.5354	0.8	.031	85	37	43
SLF1360	15.0	.5906	1.0	.039	**SLF1360ZZ**	15.0	.5906	1.1	.043	111	45	41
SRF1560	17.0	.6693	1.2	.047	**SRF1560ZZ**	17.0	.6693	1.2	.047	177	69	37
SRF1760	19.0	.7480	1.2	.047	**SRF1760ZZ**	19.0	.7480	1.2	.047	231	86	34
SRF1960	22.0	.8661	1.5	.059	**SRF1960ZZ**	22.0	.8661	1.5	.059	287	109	31
-	-	-	-	-	**-**	-	-	-	-	256	138	36
SLF1170	12.2	.4803	0.6	.023	**SLF1170ZZ**	12.2	.4803	0.6	.023	46	21	43
SLF1370	14.2	.5591	0.6	.023	**SLF1370ZZ**	14.6	.5747	0.8	.031	90	43	39
SLF1470	16.0	.6299	1.0	.039	**SLF1470ZZ**	16.0	.6299	1.1	.043	120	53	37
SRF1770	19.0	.7480	1.2	.047	**SRF1770ZZ**	19.0	.7480	1.2	.047	124	64	43
SRF1970	22.0	.8661	1.5	.059	**SRF1970ZZ**	22.0	.8661	1.5	.059	229	93	30
SRF2270	25.0	.9843	1.5	.059	**SRF2270ZZ**	25.0	.9843	1.5	.059	337	140	26
-	-	-	-	-	**-**	-	-	-	-	258	124	26
SLF1280	13.2	.5197	0.6	.023	**SLF1280ZZ**	13.6	.5354	0.8	.031	52	26	39
SLF1480	15.6	.6142	0.8	.031	**SLF1480ZZ**	15.6	.6142	0.8	.031	84	40	35
SLF1680	18.0	.7087	1.0	.039	**SLF1680ZZ**	18.0	.7087	1.1	.043	164	73	32
-	-	-	-	-	**-**	-	-	-	-	164	73	32
SRF1980	22.0	.8661	1.5	.059	**SRF1980ZZ**	22.0	.8661	1.5	.059	173	88	43
SRF2280	25.0	.9843	1.5	.059	**SRF2280ZZ**	25.0	.9843	1.5	.059	337	140	26
-	-	-	-	-	**-**	-	-	-	-	258	124	24
-	-	-	-	-	**-**	-	-	-	-	258	138	34
-	-	-	-	-	**-**	-	-	-	-	354	199	34
SLF1490	15.5	.6102	0.8	.031	**SLF1490ZZ**	15.5	.6102	0.8	.031	93	48	42
SLF1790	19.0	.7480	1.0	.039	**SLF1790ZZ**	19.0	.7480	1.1	.043	176	83	30
SLF2090	23.0	.9055	1.5	.059	**SLF2090ZZ**	23.0	.9055	1.5	.059	192	101	27
SLF2090W06	23.0	.9055	1.5	.059	**-**	-	-	-	-	252	110	40
-	-	-	-	-	**-**	-	-	-	-	260	138	38
-	-	-	-	-	**-**	-	-	-	-	354	199	21
-	-	-	-	-	**-**	-	-	-	-	475	212	30

HIGH SPEED SPECIALTY

Miniature - *Angular Contact*





Notes:

1. Basic numbers shown include code "S" for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the "S" prefix code.
2. See page 40 for ABEC tolerances.
3. See page 35 for f/n vs. cage, lubricant and ring rotation.
4. r=Maximum shaft or housing fillet radius that bearing corners will clear.

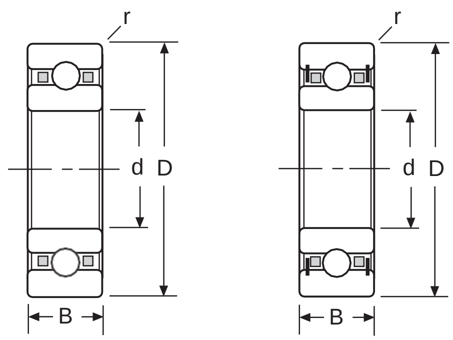
Please consult IBSCO for machined cage options.

■ Also available in flanged version.

BORE d		O.D. D		WIDTH B		IBSCO NUMBER	FILLET RADIUS		LOAD RATINGS Lbs.		N_{max} | f_n rpm/1000
MM	INCH	MM	INCH	MM	INCH		MM	INCH	DYN.	STATIC	
2.000	.0787	6.000	.2362	2.301	.0906	SAR620M	0.08	.003	29	10	98
2.380	.0937	7.938	.3125	2.779	.1094	SAR1-5SD502	0.13	.005	60	22	75
2.380	.0937	7.938	.3125	2.779	.1094	SAR1-5SD507	0.13	.005	60	22	75
3.000	.1181	16.000	.6299	5.000	.1969	SAR1630	0.41	.016	200	85	39
3.175	.1250	6.350	.2500	2.380	.0937	SAR144■	0.08	.003	33	12	79
3.175	.1250	6.350	.2500	2.779	.1094	SAR144ZW05■	0.08	.003	33	12	79
3.175	.1250	7.938	.3125	2.779	.1094	SAR2-5	0.08	.003	60	22	68
3.175	.1250	9.525	.3750	3.967	.1562	SAR2	0.30	.012	66	26	61
3.175	.1250	9.525	.3750	3.967	.1562	SAR2SD512	0.30	.012	66	26	61
4.000	.1575	7.000	.2756	2.000	.0787	SAL740	0.08	.003	19	7	72
4.000	.1575	16.000	.6299	5.000	.1969	SAR1640SD509	0.41	.016	200	85	39
4.763	.1875	12.700	.5000	3.967	.1562	SAR3SD503	0.30	.012	159	70	44
4.763	.1875	12.700	.5000	3.967	.1562	SAR3SD509	0.30	.012	152	67	44
4.763	.1875	12.700	.5000	3.967	.1562	SAR3SD509	0.30	.012	152	67	44
5.000	.1969	16.000	.6299	5.000	.1969	SAR1650SD506	0.41	.016	200	85	39
6.000	.2362	19.000	.7480	6.000	.2362	SAR1960	0.41	.016	300	135	31
6.000	.2362	19.000	.7480	6.000	.2362	SAR1960	0.41	.016	338	154	31
6.350	.2500	12.700	.5000	4.763	.1875	SAR188XZZF	0.13	.005	200	100	16
6.350	.2500	15.875	.6250	4.978	.1960	SAR4	0.30	.012	159	70	35
6.350	.2500	15.875	.6250	4.978	.1960	SAR4ZZ501F	0.30	.012	442	244	14
6.350	.2500	15.875	.6250	4.978	.1960	SAR4SD504	0.30	.012	172	79	35
8.000	.3150	22.000	.8661	7.000	.2756	SABR2280SD503	0.41	.016	344	162	26
8.000	.3150	22.000	.8661	7.000	.2756	SAR2280SD503	0.41	.016	640	375	26
8.000	.3150	22.000	.8661	7.000	.2756	SAR2280SD502	0.41	.016	640	375	26
9.000	.3543	24.000	.9449	7.000	.2756	SAR2490	0.41	.016	663	376	24
9.000	.3543	26.000	1.0236	8.000	.3150	SAR2690	0.41	.016	903	505	24
9.525	.3750	22.225	.8750	5.558	.2188	SAR6	0.41	.016	569	273	24
9.525	.3750	22.225	.8750	5.558	.2188	SAR6	0.41	.016	671	351	24

HIGH SPEED SPECIALTY

Miniature - Radial



Notes:

1. Basic numbers shown include code “S” for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the “S” prefix code.
2. See page 40 for ABEC tolerances.
3. See page 35 for f/n vs. cage, lubricant and ring rotation.
4. r=Maximum shaft or housing fillet radius that bearing corners will clear.

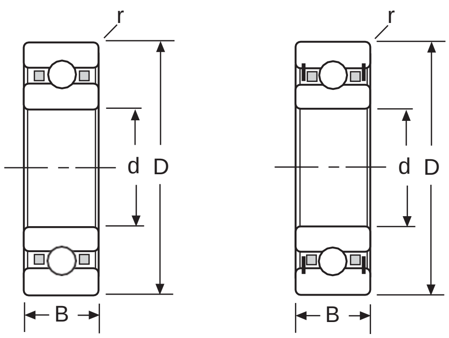
Please consult IBSCO for machined cage options.

■ Also available in flanged version.

BORE d		O.D. D		WIDTH B		IBSCO NUMBER	FILLET RADIUS		LOAD RATINGS Lbs.		N_{max} |fn rpm/1000
MM	INCH	MM	INCH	MM	INCH		MM	INCH	DYN.	STATIC	
2.380	**.0937**	4.763	**.1875**	1.588	**.0625**	**SR133MC■**	0.08	**.003**	19	6.5	109
2.380	**.0937**	4.763	**.1875**	2.380	**.0937**	**SR133ZZMC■**	0.08	**.003**	19	6.5	109
2.500	.0984	**5.000**	.1969	**1.500**	.0591	**SL525MC**	**0.08**	.003	20	7	102
3.000	.1181	**7.000**	.2756	**2.000**	.0787	**SL730MC**	**0.08**	.003	40	15	78
3.175	**.1250**	6.350	**.2500**	2.380	**.0937**	**SR144MC■**	0.08	**.003**	33	12	79
3.175	**.1250**	6.350	**.2500**	2.779	**.1094**	**SR144ZZMC■**	0.08	**.003**	33	12	79
3.175	**.1250**	7.938	**.3125**	2.779	**.1094**	**SR2-5MC■**	0.08	**.003**	60	22	68
3.175	**.1250**	7.938	**.3125**	3.571	**.1406**	**SR2-5ZZMC■**	0.08	**.003**	60	22	68
3.175	**.1250**	9.525	**.3750**	3.571	**.1406**	**SR2-6ZZMC**	0.13	**.005**	60	22	68
3.175	**.1250**	9.525	**.3750**	3.967	**.1562**	**SR2ZZMC■**	0.30	**.012**	66	26	61
3.175	**.1250**	12.700	**.5000**	4.366	**.1719**	**SR2AZZMC**	0.30	**.012**	66	26	61
3.967	**.1562**	7.938	**.3125**	2.779	**.1094**	**SR155MC■**	0.08	**.003**	41	15	61
3.967	**.1562**	7.938	**.3125**	3.175	**.1250**	**SR155ZZMC■**	0.08	**.003**	41	15	61
4.000	.1575	**7.000**	.2756	**2.000**	.0787	**SL740MC**	**0.08**	.003	20	7	72
4.000	.1575	**9.000**	.3543	**2.500**	.0984	**SL940MC**	**0.30**	.012	66	26	61
4.763	**.1875**	7.938	**.3125**	2.779	**.1094**	**SR156MC■**	0.08	**.003**	41	15	61
4.763	**.1875**	7.938	**.3125**	3.175	**.1250**	**SR156ZZMC■**	0.08	**.003**	41	15	61
4.763	**.1875**	9.525	**.3750**	3.175	**.1250**	**SR166MC■**	0.08	**.003**	76	31	54
4.763	**.1875**	9.525	**.3750**	3.175	**.1250**	**SR166ZZMC■**	0.08	**.003**	76	31	54
4.763	**.1875**	12.700	**.5000**	3.967	**.1562**	**SR3MC■**	0.30	**.012**	140	59	44
4.763	**.1875**	12.700	**.5000**	4.978	**.1960**	**SR3ZZMC■**	0.30	**.012**	140	59	44
5.000	.1969	**11.000**	.4331	**5.000**	.1969	**SL1150ZZMC**	**0.15**	.006	66	26	48
6.000	.2362	**13.000**	.5118	**5.000**	.1969	**SL1360ZZMC**	**0.36**	.014	115	49	41
6.350	**.2500**	12.700	**.5000**	3.175	**.1250**	**SR188MC**	0.13	**.005**	88	40	40
6.350	**.2500**	12.700	**.5000**	3.967	**.1562**	**SR1810Z502MC■**	0.13	**.005**	93	43	37
6.350	**.2500**	12.700	**.5000**	4.763	**.1875**	**SR188ZZMC**	0.13	**.005**	88	40	40
6.350	**.2500**	15.875	**.6250**	4.978	**.1960**	**SR4ZZMC■**	0.30	**.012**	159	70	35
6.350	**.2500**	15.875	**.6250**	4.978	**.1960**	**SR4X3ZZMC■**	0.30	**.012**	159	70	35
6.350	**.2500**	19.050	**.7500**	5.558	**.2188**	**SR4AMT**	0.41	**.016**	412	193	31
6.350	**.2500**	19.050	**.7500**	7.142	**.2812**	**SR4AZZMT**	0.41	**.016**	412	193	31

HIGH SPEED SPECIALTY

Miniature - *Radial*



Notes:

1. Basic numbers shown include code "S" for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the "S" prefix code.
2. See page 40 for ABEC tolerances.
3. See page 35 for f/n vs. cage, lubricant and ring rotation.
4. r=Maximum shaft or housing fillet radius that bearing corners will clear.

Please consult IBSCO for machined cage options.

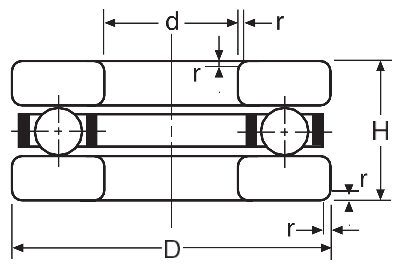
■ Also available in flanged version.

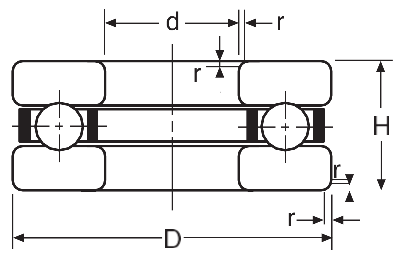
BORE d		O.D. D		WIDTH B		IBSCO NUMBER	FILLET RADIUS		LOAD RATINGS Lbs.		N_{max} | f_n rpm/1000
MM	INCH	MM	INCH	MM	INCH		MM	INCH	DYN.	STATIC	
7.000	.2756	22.000	.8661	10.312	.4060	SR2270ZZ301MT	0.41	.016	569	273	26
7.938	.3125	12.700	.5000	3.967	.1562	SR1810MC■	0.13	.005	93	43	37
7.938	.3125	12.700	.5000	3.967	.1562	SR1810ZZ505MC	0.13	.005	93	43	37
8.000	.3150	16.000	.6299	6.000	.2362	SL1680ZZW06MC	0.30	.012	170	79	32
8.000	.3150	22.000	.8661	7.000	.2756	SR2280MT	0.41	.016	569	273	26
8.000	.3150	22.000	.8661	10.312	.4060	SR2280ZZ301MT	0.41	.016	569	273	26
9.525	.3750	15.875	.6250	3.967	.1562	SR620MC	0.25	.010	96	53	30
9.525	.3750	15.875	.6250	4.978	.1960	SR620ZZW11MC	0.25	.010	96	53	30
9.525	.3750	22.225	.8750	5.558	.2188	SR6MC■	0.41	.016	569	273	24
9.525	.3750	22.225	.8750	7.412	.2812	SR6ZZMC■	0.41	.016	569	273	24
12.700	.5000	19.050	.7500	3.967	.1562	SR824ZMC	0.25	.010	111	71	24
12.700	.5000	19.050	.7500	4.978	.1960	SR824ZZW11MT	0.25	.010	111	71	24
15.875	.6250	22.225	.8750	3.967	.1562	SR1028MT	0.25	.010	116	81	20
15.875	.6250	22.225	.8750	4.978	.1960	SR1028ZZW11MT	0.25	.010	116	81	20
19.050	.7500	25.400	1.000	3.967	.1562	SR1232ZMT	0.25	.010	127	89	17

High Speed Specialty Bearings (HSSB) have been developed for applications that require precise running accuracy and high speed capability, with the option of autoclavability. These bearings are widely used in critical Dental/Medical Applications, although they are ideally suited for any high speed (up to 500,000 RPM) application. The design of these bearings incorporates the advantages of super precision tolerancing, balanced design, raceway super finishing, and a variety of retainer options. While the sizes listed in this section represent current production sizes, almost any size in this catalog under 1.1250 O.D.can be produced to take advantage of the operating characteristics of the HSSB's.

METRIC SERIES

Ball Thrust





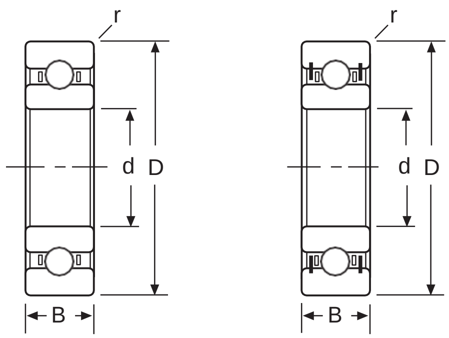
Notes:

1. r=Maximum shaft or housing fillet radius that bearing corners will clear.
2. Inch dimensions for reference only.

BORE d		O.D. D		HEIGHT H		IBSCO PART NUMBER	FILLET RADIUS		LOAD RATINGS Lbs.	
MM	INCH	MM	INCH	MM	INCH		MM	INCH	DYN.	STATIC
2.00	.0787	**6.00**	.2362	**3.00**	.1181	**F26**	0.15	.006	26	19
2.50	.0984	**7.00**	.2756	**3.50**	.1378	**F27**	0.15	.006	35	26
3.00	.1181	**8.00**	.3150	**3.50**	.1378	**F38**	0.20	.008	37	31
3.00	.1181	**8.00**	.3150	**3.50**	.1378	**F38M**	0.20	.008	223	133
4.00	.1575	**9.00**	.3543	**4.00**	.1575	**F49**	0.20	.008	37	35
4.00	.1575	**9.00**	.3543	**4.00**	.1575	**F49M**	0.20	.008	212	144
4.00	.1575	**10.00**	.3937	**4.00**	.1575	**F410**	0.20	.008	37	35
4.00	.1575	**10.00**	.3937	**4.00**	.1575	**F410M**	0.20	.008	208	149
5.00	.1969	**11.00**	.4331	**4.50**	.1773	**F511**	0.20	.008	64	64
5.00	.1969	**12.00**	.4724	**4.00**	.1575	**F512M**	0.20	.008	237	212
6.00	.2362	**12.00**	.4724	**4.50**	.1773	**F612**	0.20	.008	62	64
6.00	.2362	**12.00**	.4724	**4.50**	.1773	**F612M**	0.20	.008	409	357
6.00	.2362	**14.00**	.5512	**5.00**	.1969	**F614M**	0.25	.010	484	382
7.00	.2756	**13.00**	.5118	**4.50**	.1773	**F713M**	0.20	.008	399	355
7.00	.2756	**15.00**	.5906	**5.00**	.1969	**F715**	0.30	.012	125	123
7.00	.2756	**17.00**	.6693	**6.00**	.2362	**F717M**	0.20	.008	694	601
8.00	.3150	**16.00**	.6299	**5.00**	.1969	**F816**	0.30	.012	134	141
8.00	.3150	**16.00**	.6299	**5.00**	.1969	**F816M**	0.30	.012	884	799
8.00	.3150	**19.00**	.7480	**7.00**	.2756	**F819M**	0.40	.016	885	781
9.00	.3543	**17.00**	.6693	**5.00**	.1969	**F917**	0.30	.012	130	141
9.00	.3543	**20.00**	.7874	**7.00**	.2756	**F920M**	0.40	.016	867	803
10.00	.3937	**18.00**	.7087	**5.50**	.2167	**F1018**	0.30	.012	139	158
10.00	.3937	**18.00**	.7087	**5.50**	.2167	**F1018M**	0.30	.012	555	612

INCH SERIES

Thin Section - *Radial*



Notes:

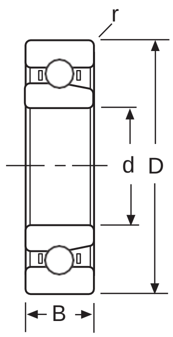
1. Basic numbers shown include code "S" for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the "S" prefix code.
2. See page 40 for ABEC tolerances.
3. See page 35 for f/n vs. cage, lubricant and ring rotation.
4. Fillet radius for all sizes = .010 inch.

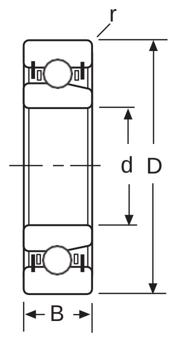
* 1 Shield may be added with no change in width dimension.

BORE d	O.D. D	WIDTH (B)				IBSCO NUMBER	LOAD RATINGS Lbs.		N_{max} f_n rpm/1000
		Ribbon Retainer		Phenolic Retainer					
INCH	INCH	Open	Shielded	Open *	Shielded		DYN.	STATIC	
.3750	.6250	.1562	.1562	-	-	**SR620 (ZZ)**	96	53	30.0
.3750	.6250	-	-	.1562	-	**SR620K (ZK)**	96	53	30.0
.3750	.6250	-	-	-	.1960	**SR620ZZW11K**	96	53	30.0
.5000	.7500	.1562	.1562	-	-	**SR824 (ZZ)**	111	71	24.0
.5000	.7500	-	-	.1562	-	**SR824K (ZK)**	111	71	24.0
.5000	.7500	-	-	-	.1960	**SR824ZZW11K**	111	71	24.0
.6250	.8750	.1562	.1562	-	-	**SR1028 (ZZ)**	116	99	20.0
.6250	.8750	-	-	.1562	-	**SR1028K (ZK)**	116	99	20.0
.6250	.8750	-	-	-	.1960	**SR1028ZZW11K**	116	99	20.0
.7500	1.000	.1562	.1562	-	-	**SR1232 (ZZ)**	127	99	17.0
.7500	1.000	-	-	.1562	-	**SR1232K (ZK)**	127	99	17.0
.7500	1.000	-	-	-	.1960	**SR1232ZZW11K**	127	99	17.0
.8750	1.1250	.1562	.1562	-	-	**SR1436 (ZZ)**	137	109	14.5
.8750	1.1250	-	-	.1562	-	**SR1436K (ZK)**	137	109	14.5
.8750	1.1250	-	-	-	.1960	**SR1436ZZW11K**	137	109	14.5
1.0625	1.3125	.1562	.1562	-	-	**SR1742 (ZZ)**	145	128	11.6
1.0625	1.3125	-	-	.1562	-	**SR1742K (ZK)**	145	128	11.6
1.0625	1.3125	-	-	-	.1960	**SR1742ZZW11K**	145	128	11.6
1.2500	1.5000	.1562	.1562	-	-	**SR2048 (ZZ)**	154	146	9.8
1.2500	1.5000	-	-	.1562	-	**SR2048K (ZK)**	154	146	9.8
1.2500	1.5000	-	-	-	.1960	**SR2048ZZW11K**	154	146	9.8
1.3750	1.6250	.1562	.1562	-	-	**SR2252 (ZZ)**	163	165	8.9
1.3750	1.6250	-	-	.1562	-	**SR2252K (ZK)**	163	165	8.9
1.3750	1.6250	-	-	-	.1960	**SR2252ZZW11K**	163	165	8.9
1.5000	1.7500	.1562	.1562	-	-	**SR2456 (ZZ)**	166	174	8.2
1.5000	1.7500	-	-	.1562	-	**SR2456K (ZK)**	166	174	8.2
1.5000	1.7500	-	-	-	.1960	**SR2456ZZW11K**	166	174	8.2
1.6250	1.8750	.1562	.1562	-	-	**SR2660 (ZZ)**	175	193	7.6
1.6250	1.8750	-	-	.1562	-	**SR2660K (ZK)**	175	193	7.6
1.6250	1.8750	-	-	-	.1960	**SR2660ZZW11K**	175	193	7.6

INCH SERIES

Thin Section - *Angular Contact with Phenolic Retainers*



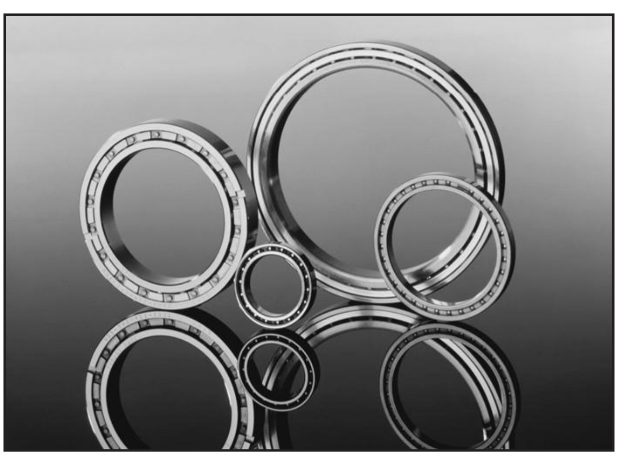


Notes:

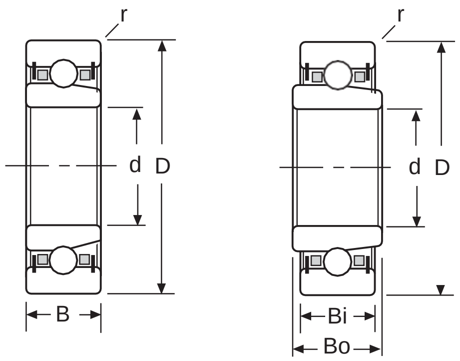
1. Basic numbers shown include code "S" for ASI 440C or DD stainless steel. If chrome alloy SAE 52100 is desired, delete the "S" prefix code.
2. See page 40 for ABEC tolerances.
3. See page 35 for f/n vs. cage, lubricant and ring rotation.
4. Fillet radius for all sizes = .010 inch.

* 1 Shield may be added with no change in width dimension.

BORE d		O.D. D		WIDTH B		IBSCO PART NUMBER	LOAD RATINGS Lbs.		Speed Rating (Oil)
INCH	MM	INCH	MM	INCH	MM		DYN.	STATIC	
.3750	9.5250	**.6250**	15.8750	**.1562**	3.9687	**SAR620K**	124	60	36,000
.5000	12.7000	**.7500**	19.0500	**.1562**	3.9687	**SAR824K**	141	81	28,800
.6250	15.8750	**.8750**	22.2250	**.1562**	3.9687	**SAR1028K**	147	95	24,000
.7500	19.0500	**1.000**	25.4000	**.1562**	3.9687	**SAR1232K**	164	121	20,400
.8750	22.2250	**1.1250**	28.5750	**.1562**	3.9687	**SAR1436K**	165	130	16,900
1.0625	26.9875	**1.3125**	33.3375	**.1562**	3.9687	**SAR1742K**	177	157	13,900
1.2500	31.7500	**1.5000**	38.1000	**.1562**	3.9687	**SAR2048K**	190	183	11,800
1.3750	34.9250	**1.6250**	41.2750	**.1562**	3.9687	**SAR2252K**	200	206	10,700
1.5000	38.1000	**1.7500**	44.4500	**.1562**	3.9687	**SAR2456K**	207	223	9,800
1.6250	41.2750	**1.8750**	47.6250	**.1562**	3.9687	**SAR2660K**	215	241	9,100



Torque Tube - *ABEC 5&7 - Angular Contact - Phenolic Retainer*

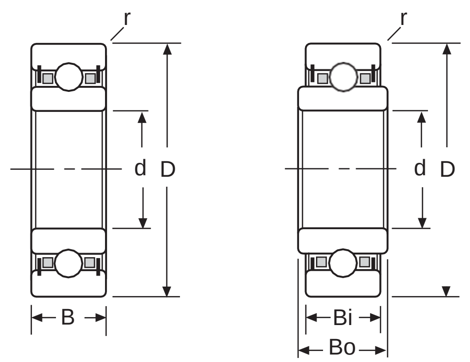


Notes:

1. Basic numbers shown include code "S" for ASI 440C stainless steel. If chrome alloy SAE 52100 is desired, delete the "S" prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.
4. Speed ratings shown for open bearing.

BORE d	O.D. D	WIDTH B	IBSCO PART NUMBER	WIDTH INNER Bi	WIDTH OUTER Bo	FILLET RADIUS r	LOAD RATINGS Lbs. DYN.	LOAD RATINGS Lbs. STATIC	Speed Rating (Oil)
.6250	1.0625	.2500	**SAR538K**	-	-	.015	547	344	23,600
.6250	1.0625	-	**SAR538EEK**	.2812	.2500	.015	547	344	23,600
.7500	1.1875	.2500	**SAR539K**	-	-	.015	536	347	19,685
.7500	1.1875	-	**SAR539EEK**	.2812	.2500	.015	536	347	19,685
.8750	1.3125	.2500	**SAR540K**	-	-	.015	581	408	16,900
.8750	1.3125	-	**SAR540EEK**	.2812	.2500	.015	581	408	16,900
1.0625	1.5000	.2500	**SAR541K**	-	-	.015	616	471	13,900
1.0625	1.5000	-	**SAR541EEK**	.2812	.2500	.015	616	471	13,900
1.3125	1.7500	.2500	**SAR542K**	-	-	.015	640	534	11,300
1.3125	1.7500	-	**SAR542EEK**	.2812	.2500	.015	640	534	11,300
1.5625	2.0000	.2500	**SADR543K**	-	-	.015	761	746	9,400
1.5625	2.0000	-	**SAR543EEK**	.2812	.2500	.015	761	746	9,400
1.8125	2.2500	.2500	**SAR544K**	-	-	.015	806	869	8,100
1.8125	2.2500	-	**SAR544EEK**	.2812	.2500	.015	806	869	8,100
2.0625	2.6250	.2500	**SAR545K**	-	-	.015	834	963	7,200
2.0625	2.6250	-	**SAR545EEK**	.2812	.2500	.015	834	963	7,200
2.3125	2.8750	.2500	**SAR546K**	-	-	.015	879	1024	6,400
2.3125	2.8750	-	**SAR546EEK**	.2812	.2500	.015	879	1024	6,400
2.5625	3.2500	.3120	**SAR547K**	-	-	.015	1462	1598	5,800
2.5625	3.2500	-	**SAR547EEK**	.3750	.3120	.015	1462	1598	5,800
2.8125	3.5000	.3120	**SAR548K**	-	-	.015	1505	1725	5,200
2.8125	3.5000	-	**SAR548EEK**	.3750	.3120	.015	1505	1725	5,200
3.0625	3.8750	.3120	**SAR549K**	-	-	.015	1606	1977	4,800
3.0625	3.8750	-	**SAR549EEK**	.3750	.3120	.015	1606	1977	4,800

Torque Tube - Abec 5&7 - Phenolic Retainer



Notes:

1. Basic numbers shown include code "S" for ASI 440C stainless steel. If chrome alloy SAE 52100 is desired, delete the "S" prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.
4. Metric dimensions for reference only.

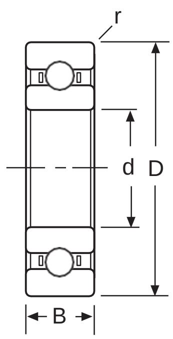
* Speed Rating 1 - No closures with oil
* Speed Rating 2 - Shielded with grease

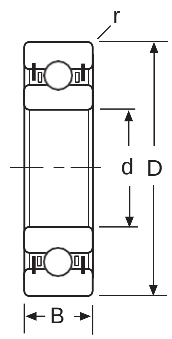
BORE d	O.D. D	WIDTH B	IBSCO PART NUMBER	WIDTH INNER Bi	WIDTH OUTER Bo	FILLET RADIUS r	LOAD RATINGS Lbs. DYN.	STATIC	Speed Rating 1* & 2*
.6250	1.0625	.2500	**SR538(ZZ)K**	-	-	.015	547	344	19,700
.6250	1.0625	-	**SR538(ZZ)EEK**	.2812	.2500	.015	547	344	7,900
.7500	1.1875	.2500	**SR539(ZZ)K**	-	-	.015	536	347	16,400
.7500	1.1875	-	**SR539(ZZ)EEK**	.2812	.2500	.015	536	347	6,600
.8750	1.3125	.2500	**SR540(ZZ)K**	-	-	.015	581	408	14,500
.8750	1.3125	-	**SR540(ZZ)EEK**	.2812	.2500	.015	581	408	5,600
1.0625	1.5000	.2500	**SR541(ZZ)K**	-	-	.015	616	471	11,600
1.0625	1.5000	-	**SR541(ZZ)EEK**	.2812	.2500	.015	616	471	4,600
1.3125	1.7500	.2500	**SR542(ZZ)K**	-	-	.015	640	534	9,400
1.3125	1.7500	-	**SR542(ZZ)EEK**	.2812	.2500	.015	640	534	3,800
1.5625	2.0000	.2500	**SR543(ZZ)K**	-	-	.015	761	746	7,900
1.5625	2.0000	-	**SR543(ZZ)EEK**	.2812	.2500	.015	761	746	3,200
1.8125	2.2500	.2500	**SR544(ZZ)K**	-	-	.015	806	869	6,800
1.8125	2.2500	-	**SR544(ZZ)EEK**	.2812	.2500	.015	806	869	2,700
2.0625	2.6250	.2500	**SR545(ZZ)K**	-	-	.015	834	963	6,000
2.0625	2.6250	-	**SR545(ZZ)EEK**	.2812	.2500	.015	834	963	2,400
2.3125	2.8750	.2500	**SR546(ZZ)K**	-	-	.015	879	1024	5,300
2.3125	2.8750	-	**SR546(ZZ)EEK**	.2812	.2500	.015	879	1024	2,100
2.5625	3.2500	.3120	**SR547(ZZ)K**	-	-	.015	1462	1598	4,800
2.5625	3.2500	-	**SR547(ZZ)EEK**	.3750	.3120	.015	1462	1598	1,900
2.8125	3.5000	.3120	**SR548(ZZ)K**	-	-	.015	1505	1725	4,400
2.8125	3.5000	-	**SR548(ZZ)EEK**	.3750	.3120	.015	1505	1725	1,800
3.0625	3.8750	.3120	**SR549(ZZ)K**	-	-	.015	1606	1977	4,000
3.0625	3.8750	-	**SR549(ZZ)EEK**	.3750	.3120	.015	1606	1977	1,600

Double Shielded bearing uses thin section phenolic retainer, reducing speed rating.
Single Shielded construction is available with full section phenolic retainer (w/oil) maintaining same speed rating as with no closures.

METRIC SERIES

Thin Section - Unflanged



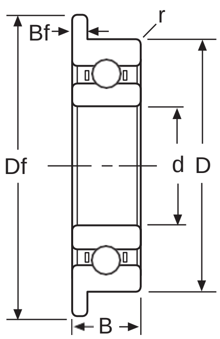


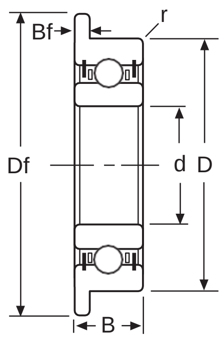
Notes:

1. Basic numbers shown include code “S” for ASI 440C stainless steel. If chrome alloy SAE 52100 is desired, delete the “S” prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.
4. Inch dimensions for reference only.
5. Available with seals; change code ZZ to DD for full contact or VV for non-contact.

BORE d		O.D. D		WIDTH B		IBSCO NUMBER	IBSCO NUMBER	FILLET RADIUS		MAX SPEED (rpm)/1000	
MM	INCH	MM	INCH	MM	INCH	OPEN	SHIELDED	MM	INCH	Grease	Oil
10	.3937	15	.5906	3.0	.1181	S6700	-	0.15	.006	15.0	17.0
10	.3937	15	.5906	4.0	.1575	-	S6700ZZ	0.15	.006	15.0	17.0
10	.3937	19	.7480	5.0	.1969	S6800	S6800ZZ	0.30	.012	37.0	43.0
10	.3937	19	.7480	7.0	.2756	S63800	S63800ZZ	0.30	.012	37.0	43.0
10	.3937	22	.8661	6.0	.2362	S6900	S6900ZZ	0.30	.012	34.0	41.0
12	.4724	18	.7087	4.0	.1575	S6701	S6701ZZ	0.20	.008	13.0	15.0
12	.4724	21	.8268	5.0	.1969	S6801	S6801ZZ	0.30	.012	33.0	39.0
12	.4724	21	.8268	7.0	.2756	S63801	S63801ZZ	0.30	.012	33.0	39.0
12	.4724	24	.9449	6.0	.2362	S6901	S6901ZZ	0.30	.012	31.0	36.0
15	.7087	21	.8268	4.0	.1575	S6702	S6702ZZ	0.20	.008	11.0	13.0
15	.7087	24	.9449	5.0	.1969	S6802	S6802ZZ	0.30	.012	28.0	33.0
15	.7087	24	.9449	7.0	.2756	S63802	S63802ZZ	0.30	.012	28.0	33.0
15	.7087	28	1.1024	7.0	.2756	S6902	S6902ZZ	0.30	.012	26.0	30.0
17	.6693	23	.9055	4.0	.1575	S6703	S6703ZZ	0.20	.008	9.5	11.0
17	.6693	26	1.0236	5.0	.1969	S6803	S6803ZZ	0.30	.012	26.0	30.0
17	.6693	26	1.0236	7.0	.2756	S63803	S63803ZZ	0.30	.012	26.0	30.0
17	.6693	30	1.1811	7.0	.2756	S6903	S6903ZZ	0.30	.012	23.0	28.0
20	.7874	27	1.0630	4.0	.1575	S6704	S6704ZZ	0.20	.008	8.5	10.0
20	.7874	32	1.2598	7.0	.2756	S6804	S6804ZZ	0.30	.012	21.0	25.0
20	.7874	37	1.4567	9.0	.3543	S6904	S6904ZZ	0.30	.012	19.0	23.0
25	.9843	32	1.2598	4.0	.1575	S6705	-	0.20	.008	7.0	8.0
25	.9843	37	1.4567	7.0	.2756	S6805	S6805ZZ	0.30	.012	18.0	21.0
25	.9843	42	1.6535	9.0	.3543	S6905	S6905ZZ	0.30	.012	16.0	19.0
30	1.1811	37	1.4567	4.0	.1575	S6706	-	0.20	.008	5.5	7.0
30	1.1811	42	1.6535	7.0	.2756	S6806	S6806ZZ	0.30	.012	15.0	18.0
30	1.1811	47	1.8504	9.0	.3543	S6906	S6906ZZ	0.30	.012	14.0	17.0
35	1.3780	44	1.7323	5.0	.1969	S6707	-	0.30	.012	4.9	6.0
35	1.3780	47	1.8504	7.0	.2756	S6807	S6807ZZ	0.30	.012	13.0	16.0
35	1.3780	55	2.1654	10.0	.3937	S6907	S6907ZZ	0.60	.024	12.0	14.0
40	1.5748	50	1.9685	6.0	.2362	S6708	-	0.30	.012	4.3	5.0
40	1.5748	52	2.0472	7.0	.2756	S6808	S6808ZZ	0.30	.012	12.0	14.0
40	1.5748	62	2.4409	12.0	.4724	S6908	S6908ZZ	0.60	.024	11.0	13.0
45	1.7717	55	2.1654	6.0	.2362	S6709	-	0.30	.012	3.9	4.6
45	1.7717	58	2.2835	7.0	.2756	S6809	S6809ZZ	0.30	.012	11.0	13.0
45	1.7717	68	2.6772	12.0	.4724	S6909	S6909ZZ	0.60	.024	9.7	11.0

METRIC SERIES





Notes:

1. Basic numbers shown include code "S" for ASI 440C stainless steel. If chrome alloy SAE 52100 is desired, delete the "S" prefix code.
2. See page 40 for ABEC tolerances.
3. r=Maximum shaft or housing fillet radius that bearing corners will clear.
4. Inch dimensions for reference only.
5. Available with seals; change code ZZ to DD for full contact or VV for non-contact.

Thin Section - Flanged

FLANGE DIA. (Df)		FLANGE WIDTH (Bf)		IBSCO NUMBER OPEN	IBSCO NUMBER SHIELDED	LAND DIAMETERS (Ref.) Li		LAND DIAMETERS (Ref.) Lo		LOAD RATING (Kgs.)	
MM	INCH	MM	INCH			MM	INCH	MM	INCH	DYN	STATIC
16.5	0.6496	**0.8**	.032	**SF6700**	**-**	**11.21**	.4413	**13.60**	.5354	87	44
16.5	0.6496	**0.8**	.032	**-**	**SF6700ZZ**	**11.21**	.4413	**13.60**	.5354	87	44
21.0	0.8268	**1.0**	.040	**SF6800**	**SF6800ZZ**	**12.74**	.5016	**16.26**	.6402	175	85
21.0	0.8268	**1.5**	.059	**SF63800**	**SF63800ZZ**	**12.74**	.5016	**16.26**	.6402	175	85
25.0	0.9843	**1.5**	.059	**SF6900**	**SF6900ZZ**	**13.90**	.5472	**18.20**	.7165	274	129
19.5	0.7677	**0.8**	.032	**SF6701**	**SF6701ZZ**	**13.86**	.5457	**16.10**	.6339	94	54
23.0	0.9055	**1.1**	.043	**SF6801**	**SF6801ZZ**	**14.80**	.5827	**18.30**	.7205	195	106
23.0	0.9055	**1.5**	.059	**SF63801**	**SF63801ZZ**	**14.80**	.5827	**18.30**	.7205	195	106
26.5	1.0433	**1.5**	.059	**SF6901**	**SF6901ZZ**	**16.00**	.6299	**20.30**	.7992	294	149
22.5	0.8858	**0.8**	.032	**SF6702**	**SF6702ZZ**	**16.86**	.6638	**19.10**	.7520	95	59
26.0	1.0236	**1.1**	.043	**SF6802**	**SF6802ZZ**	**17.80**	.7008	**21.30**	.8386	211	127
26.0	1.0236	**1.5**	.059	**SF63802**	**SF63802ZZ**	**17.80**	.7008	**21.30**	.8386	211	127
30.5	1.2008	**1.5**	.059	**SF6902**	**SF6902ZZ**	**18.70**	.7362	**24.20**	.9528	440	260
24.5	0.9646	**0.8**	.032	**SF6703**	**SF6703ZZ**	**18.86**	.7425	**21.10**	.8307	101	67
28.0	1.1024	**1.1**	.043	**SF6803**	**SF6803ZZ**	**19.80**	.7795	**23.30**	.9173	227	148
28.0	1.1024	**1.5**	.059	**SF63803**	**SF63803ZZ**	**19.80**	.7795	**23.30**	.9173	227	148
32.5	1.2795	**1.5**	.059	**SF6903**	**SF6903ZZ**	**20.90**	.8228	**26.80**	1.0551	467	261
28.5	1.1220	**0.8**	.032	**SF6704**	**SF6704ZZ**	**22.36**	.8803	**24.60**	.9685	142	80
35.0	1.3780	**1.5**	.043	**SF6804**	**SF6804ZZ**	**23.20**	.9134	**28.70**	1.1299	409	251
40.0	1.5748	**2.0**	.079	**SF6904**	**SF6904ZZ**	**25.20**	.9921	**32.00**	1.2598	650	375
34.0	1.3386	**1.0**	.040	**SF6705**	**-**	**27.35**	1.0768	**29.65**	1.1673	111	85
40.0	1.5748	**1.5**	.059	**SF6805**	**SF6805ZZ**	**28.20**	1.1107	**33.70**	1.3268	438	298
45.0	1.7717	**2.0**	.040	**SF6905**	**SF6905ZZ**	**30.90**	1.2165	**37.50**	1.4764	713	462
39.0	1.5354	**1.0**	.040	**SF6706**	**-**	**32.35**	1.2736	**34.65**	1.3642	116	95
45.0	1.7717	**1.5**	.059	**SF6806**	**SF6806ZZ**	**33.11**	1.3035	**38.20**	1.5039	462	346
50.0	1.9685	**2.0**	.079	**SF6906**	**SF6906ZZ**	**35.10**	1.3819	**41.95**	1.6516	738	510
-	-	-	-	-	-	-	-	-	-	190	166
-	-	-	-	-	-	-	-	-	-	482	389
-	-	-	-	-	-	-	-	-	-	1,111	797
-	-	-	-	-	-	-	-	-	-	256	227
-	-	-	-	-	-	-	-	-	-	501	426
-	-	-	-	-	-	-	-	-	-	1,394	1,016
-	-	-	-	-	-	-	-	-	-	263	244
-	-	-	-	-	-	-	-	-	-	630	548
-	-	-	-	-	-	-	-	-	-	1,437	1,104

ENGINEERING

Designing To Lower Total Cost

The majority of applications can be effectively handled using a “standard bearing”. A “standard bearing”, in this case, refers to bearing that is in such worldwide demand that large volumes are produced. This virtually guarantees continuity of supply while assuring pricing benefits for the O.E.M. Selection of a “standard bearing” at the design stage cannot be over emphasized. The considerations necessary to design for lower cost include:

- Dimensional size
- Material type
- Lubrication
- Enclosures
- Cage style (retainer)
- Manufacturability
- Assembly and fits
- Packaging
- Quality requirements

Although different designers may vary in their approach to bearing selection, the following is one method that works well.

- Establish operating, environmental and performance requirements such as load, speed, noise, etc.

- Select a bearing configuration to meet the above requirements.

  Some examples of configuration types are:

  1. Flanged or unflanged
  2. With or without a snap ring
  3. Ball complement/size

- Determine bearing envelope to accommodate shaft and housing requirements. This step is critical to cost. It is quite often more cost-effective to design the housing and shaft around a popular bearing size than vice versa.

- Specify enclosures as necessary. Be careful not to specify a more expensive enclosure than necessary to perform properly in the application.

- Specify required cage type. For the majority of cases, the standard cage for a particular chassis size will be adequate.

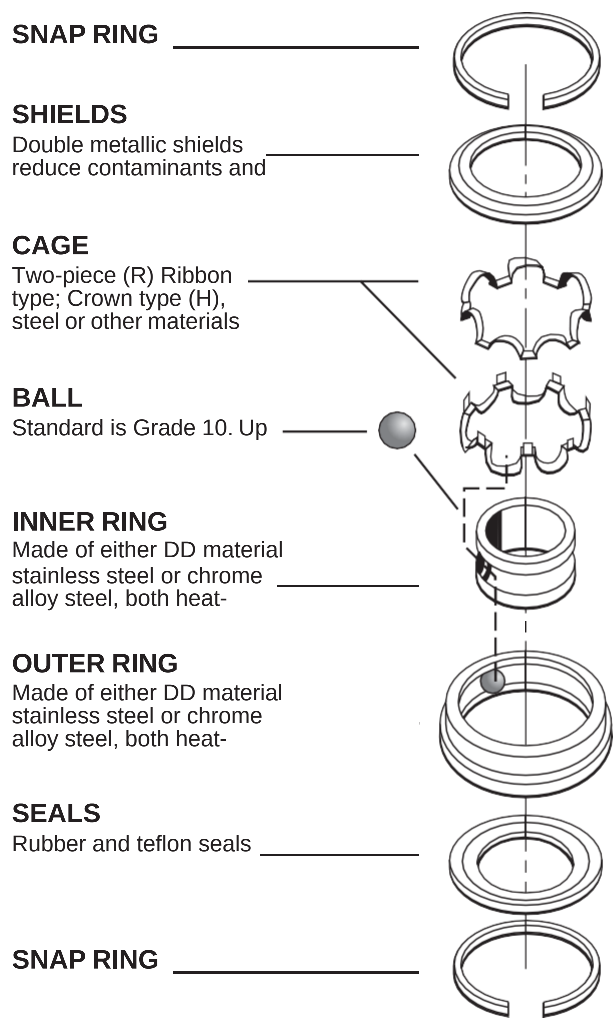
- Determine the bearing noise rating that is required for the application. For most cases, our standard “No Code” noise rating will provide quieter operation than most other components in the system. For extremely noise sensitive applications, a quieter noise rating can be specified.

- Determine degree of precision needed to achieve the performance requirements (ABEC Level).
  Do not over estimate what is truly necessary to achieve the desired performance.

- Determine the radial play specification. The standard radial play specification for a chassis size will be adequate to handle normal press fits, moderate temperature differentials and normal speeds.

- Determine lubrication requirements. This should include lubrication characteristics and the amount of lubricant needed. This is a critical step in the performance and reliability of the bearing in the application.

Care should be taken throughout this process with respect to both cost and performance. The key in designing for the lowest total cost is to involve the Sales and Application Engineering staff early in the selection process. Costs will be impacted greatly if the envelope dimensions are not given consideration at the time of bearing selection. IBSCO offers an experienced Sales and Engineering staff to help in the design and selection process insuring your success.



Definitions

Raceway, Track Diameter, and Track Radius

The raceway in a ball bearing is the circular groove formed in the outside surface of the inner ring and in the inside surface of the outer ring. When the rings are aligned, these grooves form a circular track that contains the ball set.

The track diameter and track radius are two dimensions that define the configuration of each raceway. Track diameter is the measurement of the diameter of the imaginary circle running around the deepest portion of the raceway, whether it be an inner or outer ring. This measurement is made along a line perpendicular to, and intersecting, the axis of rotation. Track radius describes the cross section of the arc formed by the raceway groove. It is measured when viewed in a direction perpendicular to the axis of the ring. In the context of ball bearing terminology, track radius has no mathematical relationship to track diameter. The distinction between the two is shown in Figure 1.

Radial and Axial Play

Most ball bearings are assembled in such a way that a slight amount of looseness exists between balls and raceways. This looseness is referred to as radial play and axial play. Specifically, radial play is the maximum distance that one bearing ring can be displaced with respect to the other, in a direction perpendicular to the bearing axis, when the bearing is in an unmounted state. Axial play, or end play, is the maximum relative displacement between the two rings of an unmounted ball bearing in the direction parallel to the bearing axis. Figure 2 illustrates these concepts.

Since radial play and axial play are both consequences of the same degree of looseness between the components in a ball bearing, they bear a mutual dependence. While this is true, both values are usually quite different in magnitude.

In most ball bearing applications, radial play is functionally more critical than axial play. If axial play is determined to be an essential requirement, control can be obtained through manipulation of the radial play specification. Please consult with Application Engineering if axial play ranges for a particular chassis size are required.

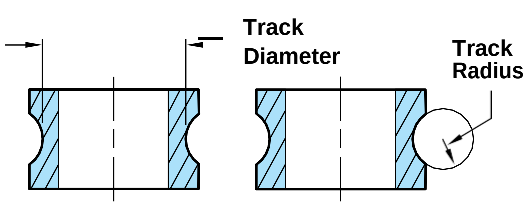


Figure 1. The distinction between track radius and track diameter (inner ring).

Some general statements about Radial Play:

1. The initial contact angle of the bearing is directly related to radial play- the higher the radial play, the higher the contact angle.

2. For support of pure radial loads, a low level of radial play is desirable; where thrust loading is predominant, higher radial play levels are recommended.

3. Radial play is affected by any interference fit between the shaft and bearing I.D. or between the housing and bearing O.D. See the Assembly and Fitting Procedure section on page 38 for more details.

Also, since the actual play remaining after assembly of the complete device is the important condition, the radial play specification for the bearing itself must be modified in accordance with the discussion on page 38. If the system spring rate is critical, or if extremes of temperature or thermal gradient will be encountered, consult with our Engineering Department prior to design finalization.

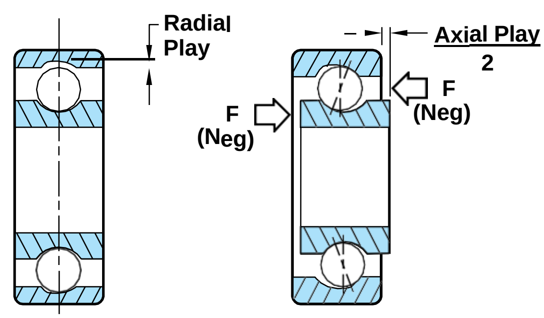


Figure 2. The distinction between radial play and axial play.

Definitions

Table Of Contact Angles

Ball Size D_W	RADIAL PLAY CODE P25	P58
.025	18°	24½°
1/32 & 0.8 mm	16½°	22°
1mm	14½°	20°
3/64	14°	18°
1/16	12°	16°
3/32	9½°	13°
1/8	12½°	17°
9/64	12°	16°
5/32	11°	15°
3/16	10°	14°

The contact angle is given for the mean radial play of the range shown i.e., for P25 (.0002" to .0005") - contact angle is given for .00035". Contact angle is affected by race curvature. For your specific application, contact IBSCO Engineering.

Typical radial play ranges are:		
Description	Radial Play Range	IBSCO Code
Tight	.0001" to .0003"	P13
Normal	.0002" to .0005"	P25
Loose	.0005" to .0008"	P58

Raceway Curvature

Raceway curvature is an expression that defines the relationship between the arc of the raceway's track radius and the arc formed by the slightly smaller ball that runs in the raceway. It is simply the track radius of the bearing raceway expressed as a percentage of the ball diameter. This number is a convenient index of "fit" between the raceway and ball. Figure 3 illustrates this relationship.

Track curvature values typically range from approximately 52 to 58 percent. The lower percentage, tight fitting curvatures are useful in applications where heavy loads are encountered. The higher percentage, loose curvatures are more suitable for torque sensitive applications. Curvatures less than 52 percent are generally avoided because of excessive rolling friction that is caused by the tight conformity between the ball and raceway. Values above 58 percent are also avoided because of the high stress levels that can result from the small ball-to-raceway conformity at the contact area.

Contact Angle

The contact angle is the angle between a plane perpendicular to the ball bearing axis and a line joining the two points where the ball makes contact with the inner and outer raceways. The contact angle of a ball bearing is determined by its free radial play value, as well as its inner and outer track curvatures.

The contact angle of thrust-loaded bearings provides an indication of ball position inside the raceways. When a thrust load is applied to a ball bearing, the balls will move away from the median planes of the raceways and assume positions somewhere between the deepest portions of the raceways and their edges. Figure 4 illustrates the concept of contact angle by showing a cross sectional view of a ball bearing that is loaded in pure thrust.

Free Angle and Angle of Misalignment

As a result of the previously described looseness, or play, which is purposely permitted to exist between the components of most ball bearings, the inner ring can be cocked or tilted a small amount with respect to the outer ring. This displacement is called the free angle of the bearing, and corresponds to the case of an unmounted bearing. The size of the free angle in a given ball bearing is determined by its radial play and track curvature values. Figure 5 illustrates this concept.

For the bearing mounted in an application, any misalignment present between the inner and outer rings (housing and shaft) is called the angle of misalignment. The misalignment capability of a bearing can have positive practical significance because it enables a ball bearing to accommodate small dimensional variations which may exist in associated shafts and housings. A maximum angle of misalignment of 1/4° is recommended before bearing life is reduced. Slightly larger angles can be accommodated, but bearing life will not be optimized.

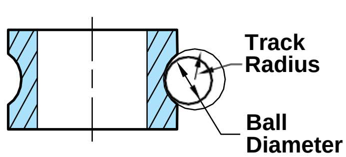


Figure 3. The relationship of track radius to ball diameter.

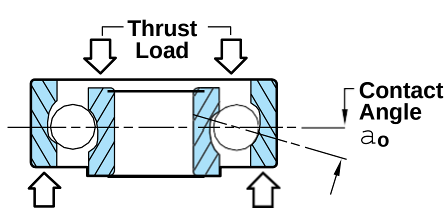


Figure 4. Contact angle for bearing loaded in pure thrust.

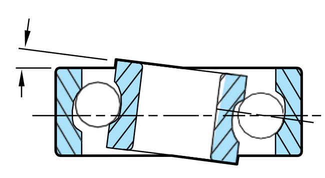


Figure 5. Free angle of the bearing.

Definitions

Bearing Materials

Chrome Steel

Bearing steel used for standard ball bearing applications in uses and in environments where corrosion resistance is not a critical factor.

52100 or Equivalent

The most commonly used ball bearing steel in such applications is SAE 52100 or its equivalent. Due to its structure, this is the material chosen for extreme noise sensitive applications.

Stainless Steel

DD400™

0.7% C; 13% Cr

A 400 series Martensitic stainless steel combined with a heat treating process that was exclusively developed by NMB's parent company. Miniature and instrument bearings manufactured from "DD" Martensitic stainless steel, or "DD Bearings", meet the performance specifications of such bearings using AISI 440C Martensitic stainless steel, and it is equal to or superior in hardness, superior in low noise characteristics, and is at least equivalent in corrosion resistance. These material characteristic advantages make for lower torque, smoother running, and longer life bearings.

AISI 440C

1% C, 17% Cr, .5% Mo

A hardened, stainless steel suitable for applications which require corrosion resistance at room to mid-hot temperature range; the standard choice for a wide range of military and commercial applications.

Alternate Ball Material

Cerbec® Bearing Components

Silicon Nitride

An extremely hard non-metallic material suitable for speeds up to 2 million dN with reduced skidding. This material is corrosion resistant, 40% lighter than steel and non-magnetic. Silicon nitride has a modulus of elasticity 50% greater than steel, therefore it resists corrosion and galling.

Material	Specification	Attributes	Room Temp. Hardness (Rc)
Silicon Nitride	CERBEC Silicon Nitride	Extended life, lower torque, light weight, higher stiffness	>78

Definitions

Shields and seals are necessary to provide optimum ball bearing life by retaining lubricants and preventing contaminants from reaching central work surfaces. IBSCO can supply ball bearings with several types of protective closures that have been designed to satisfy the requirements of most applications. Different types of closures can be supplied on the same bearing and nearly all are removable and replaceable. They are manufactured with the same care and precision that goes into our ball bearings. The following are descriptions of the most common types of shields and seals we can supply. Please consult a member of the company's Sales Engineering staff for information on the availability of special designs that may be suited to your specific applications.

Z & H Type Shields

"Z" and "H" type shields designate non-contact metal shields. "Z" type shields are the simplest form of closure and, for most bearings, are removable. "H" type shields are similar to "Z" types but are not removable.

It is advantageous to use shields rather than seals in some applications because there are no interacting surfaces to create drag. This results in no appreciable increase in torque or speed limitations and operation can be compared to that of open ball bearings.

Contact Seals

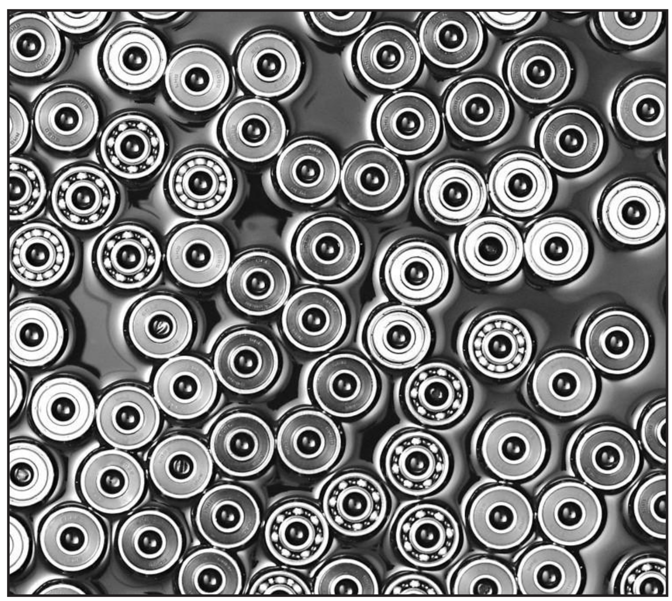
"D" type seals consist of a molded Buna-N lip seal with an integral steel insert. While this closure type provides excellent sealing characteristics, several factors must be considered for its application. The material normally used on this seal has a maximum continuous operating temperature limit of 250°F. Although it is impervious to many oils and greases, consideration must be given to lubrication selection. It is also capable of providing a better seal than most other types by increasing the seal lip pressure against the inner ring O.D. This can result in a higher bearing torque than with other type seals and may cause undesirable seal lip heat build-up in high speed applications.

Non-Contact Seals

"S" type seals are constructed in the same fashion as the "D" type seals. This closure type has the same temperature limitation of 250°F. It also is impervious to many oils and greases, but the same considerations should be noted on lubrication selection. The "S" type seal is uniquely designed to avoid contact on the inner ring land, significantly reducing torque over the "D" type configuration.

"L" type seals are fabricated from glass re-inforced teflon. When assembled, a very small gap exists between the seal lip and the inner ring O.D. It is common for some contact to occur between these components, resulting in an operating torque increase. The nature of the seal material serves to keep this torque increase to a minimum. In addition, the use of this material allows high operating temperatures with this configuration.

If you have any questions concerning the performance of IBSCO seals in special environments or high speed applications, please contact a member of our Sales Engineering staff.



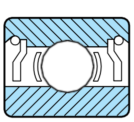


Figure 1. Two "Z" Shields (removable)

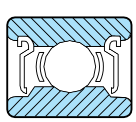


Figure 2. Two "H" Shields (non-removable)

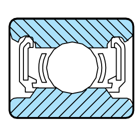


Figure 3. Two "D" Seals (contact rubber)

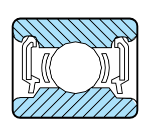


Figure 4. Two "S" Seals (non-contact rubber)

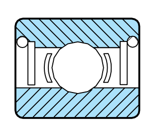


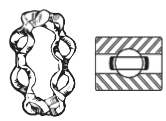
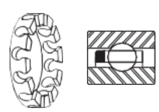
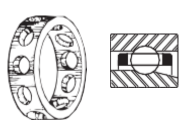
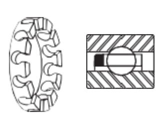
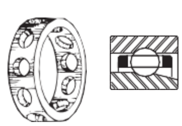
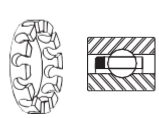
Figure 5. Two "L" Seals (non-flexed teflon)

Definitions

Cages

The retainer, also referred to as the cage or separator, is the component part of a ball bearing that separates and positions the balls at approximately equal intervals around the bearing's raceway. The most common cages are shown below. In some cases, such as high-load applications, a full compliment design may be the best choice.

For operating speed, please refer to the Nmax/fn values in the product tables and multiplier table on page 35. IBSCO can also supply specially designed cages to meet your specific requirements. If any doubt, IBSCO should be contacted for optimum cage selection.

Description	+	Design	Material	Max. Speed (ref.) dN**	Operating Temp Max.	Comments	Typical Applications
Ribbon Two-Piece Stamped, Crimped	R		A.I.S.I. 305 Steel	250,000	900°F	Superior Starting Torque Low Cost	General Purpose
Crown One-Piece Stamped	H		A.I.S.I. 410 Steel	250,000	900°F	Higher Speed Capability Than Ribbon Retainer Low Cost	General Purpose
Crown One-Piece Machined	KB KC		Phenolic-Paper Base Phenolic-Linen Base	1,200,000	250°F	High Speed Impregnated with Oil	Medical, Machine Tools, High Speed Motors
Full Type, One-Piece Machined	M4		Polyamide-imide	2,000,000	500°F	High Speed Capability Requires Lubrication Fully Autoclavable	Medical/Dental High Temperature
Crown, One-Piece Machined	M5		Polyamide-imide	1,200,000	500°F	High Speed Capability Requires Lubrication Fully Autoclavable	Medical/Dental High Temperature
Full Type, One-Piece Machined	KN KM		Phenolic-Paper Base Phenolic-Linen Base	2,000,000	250°F	High Speed, Quiet Running, Angular Contact Bearing Only, Porous Material Impregnated with Oil	Machine Tool Spindles High Speed Motors
Crown One-Piece Machined	T1*		PGM High Temp. PGM	Consult with Factory	575°F 375°F	Self-Lubricating	Low-Speed Light Load

+ Typical Part Number Designation
*Controlled by assigned special design number
**dN is bore (in millimeters) x RPM

Lubrication

Lubricant Types

Oil

Oil is the basic lubricant for ball bearings. Previously most lubricating oil was refined from petroleum. Today, however, synthetic oils such as diesters, silicone polymers, and fluorinated compounds have found acceptance because of improvements in properties. Compared to petroleum base oils, diesters in general have better low temperature properties, lower volatility, and better temperature/viscosity characteristics. Silicones and fluorinated compounds possess even lower volatility and wider temperature/viscosity properties.

Virtually all petroleum and diester oils contain additives that limit chemical changes, protect the metal from corrosion, and improve physical properties.

Grease

Grease is an oil to which a thickener has been added to prevent oil migration from the lubrication site. It is used in situations where frequent replenishment of the lubricant is undesirable or impossible. All of the oil types mentioned in the next section can be used as grease bases to which are added metallic soaps, synthetic fillers and thickeners. The operative properties of grease depend almost wholly on the base oil. Other factors being equal, the use of grease rather than oil results in higher starting and running torque and can limit the bearing to lower speeds.

Oils and Base Fluids

Petroleum Mineral Lubricants

Petroleum lubricants have excellent load carrying abilities and are naturally good against corrosion, but are useable only at moderate temperature ranges (-25° to 250°F). Greases that use petroleum oils for bases have a high dN (in mm X speed in rpm) capability. Greases of this type would be recommended for use at moderate temperatures, light to heavy loads and moderate to high speeds.

Super-Refined Petroleum Lubricants

While these lubricants are usable at higher temperatures than petroleum oils (-65° to 350°F), they still exhibit the same excellent load carrying capacity. This further refinement eliminates unwanted properties, leaving only the desired chemical chains. Additives are introduced to increase the oxidation resistance, etc.

Synthetic Lubricants

The esters, diesters and poly-a-olefins are probably the most common synthetic lubricants. They do not have the film strength capacity of a petroleum product, but do have a wide temperature range (-65° to 350°F) and are oxidation resistant.

Synthetic hydrocarbons are finding a greater use in the miniature and instrument ball bearing industry because they have proved to be a superior general purpose lubricant for a variety of speeds, temperatures and environments.

Silicone Lubricants

Silicone products are useful over a much wider temperature range (-100° to 400°F), but do not have the load carrying ability of petroleum types and other synthetics. It has become customary in the instrument and miniature bearing industry, in recent years, to derate the dynamic load rating (Cr) of a bearing to 1/3 of the value shown in this catalog if a silicone product is used.

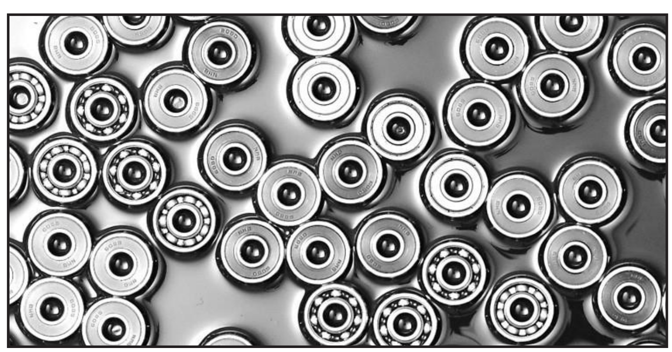
Perfluorinated Polyether (PFPE)

Oils and greases of this type have found wide use where stability at extremely high temperatures and/or chemical inertness are required. This specialty lubricant has excellent load carrying capabilities but its inertness makes it less compatible to additives, and less corrosion resistant.

Solid Film lubricants

Solid film lubricants are any non-fluids used to prevent wear and reduce friction. They can range from simple sacrificial cages to graphite powder and ion sputtering. Each type must be engineered for the specific application.

Solid film lubricants have definite advantages. They are very useful in areas of temperature extremes, vacuum, radiation, pressure or harsh environments where conventional lubricants would fail. In addition, these lubricants do not deteriorate in storage.



Lubrication

Code	Brand Name	Basic Type	Operating temp. F	Uses
LO1	ANDERSON OIL CO. WINSOR L-245X	Synthetic Oil	-65 to +300	Light general purpose instrument oil (MIL-L-6085)
LO2	NUODEX ANDEROL 401D	Synthetic Oil	-65 to +300	Light general purpose instrument oil (MIL-L-6085)
LY115	DUPONT Krytox 143AC	Fluorinated Oil	-30 to +550	High temperature stability good lubricity properties
LG20	EXXON Beacon 325	Synthetic Grease	-65 to +250	General purpose grease
LG68	ROYAL Royco 27	Synthetic Grease	-100 to +275	Corrosion resistance, heavy loads, high speed. (MIL-G-23827)
LY17	NYE Rheotemp 500	Synthetic (Non-silicone) Grease	-65 to +350	Specialty lube. High speed/high temp. Inhibits oxidation.
LY48	MOBIL MOBIL 28	Synthetic Hydrocarbon Grease	-65 to +350	Wide temperature range, good low temperature torque. (MIL-G-81322)
LY75	CHEVRON SRI-2	Mineral Grease	-20 to +350	Longer life under high speed/high temp. Water/salt water resistance
LY101	DUPONT Krytox 240AC	Fluorinated Grease	-30 to +550	High temperature stability & good lubricity properties (MIL-G-27617)
LY121	KYODO SRL	Synthetic Grease	-40 to +300	Low noise and low torque applications
LY223	CASTROL Brayco 815Z	Perfluorinated Polyether Fluid	-100 to +400	Inert, Unaffected by radiation. Extreme low temperature and High Vacuum environments.
LY328	CASTROL Braycote Micronic 601EF	Perfluorinated Polyether Grease	-112 to +400	Hostile chemical environment Space applications
LY332	ROYAL Royco 13	Silicone Grease	-100 to +450	Light loads, high temperature Water resistance. (MIL-G-25013)
LY509	NYE Nyogel 753G	Polyol Ester Based Grease	-40 to +302	Wide temperature range, non-melting
LY556	SHELL Aeroshell Grease 33	Synthetic Grease	-100 to +250	Multipurpose Airframe Grease. Enhanced corrosion resistance and load-carrying capacity.
LF27	DICRONITE Dicronite DL-5	Modified Tungsten Disulfide Dry Film	-350 to +1000	Wear resistant, inert & insoluble non-toxic, anti-corrosive, unaffected by radiation
LT124	CHEVRON Poly FM Grease EP	White Mineral Oil	-40 to +320	Food Grade, Multipurpose Water & Corrosion resistant.

Note: The above table details only a handful of the many hundreds of lubricants available from IBSCO.

IBSCO's Clean Room Lubrication Center is constructed and maintained as Class 10,000 @ 0.5 microns, with Class 100 at the bench, certified annually to Federal Standard 209E.

Utilizing the most advanced techniques and equipment, ***IBSCO's Clean Room Lubrication Center*** is certified by both ***New Hampshire Ball Bearing*** (***NHBB***) and ***NMB*** as a **Factory Authorized Re-lubrication Center**.

Lubrication Methods

Centrifuged Oil

Centrifuging an oil-lubricated bearing removes excess oil and leaves only a very thin film on all surfaces. This method is used on low torque bearings and can be specified for low torque applications.

Vacuum Impregnation of Cages

Vacuum impregnation, used with ball bearings containing porous cages, forces lubricant into the pores, using the cage as an oil reservoir. hen this method is used with a greased bearing, its purpose is to prevent the cage material from leaching oil from the lubricant. Normally, the base oil of the grease is used in the cage to prevent incompatibility.

Grease Packing

Grease packing approximately 1/4 to 1/3 of a ball bearing's internal free volume is one of the most common methods of lubrication. Grease quantities are controlled by the use of special lubrication equipment. IBSCO is able to control the amount of lubricant to 0.5mg if specified.

Grease Plating

Grease plating consists of mixing a quantity of grease and solvent to the desired consistency, lubricating the bearing with this mixture, then evaporating the solvent at a moderate temperature, leaving a thin film of grease on the raceways, balls and cage. Grease plating is used to lower torque values of grease packed bearings bearings.

Oil Plating

Oil plating consists of mixing a quantity of oil and solvent to the desired consistency, lubricating the bearing with this mixture, then evaporating the solvent at a moderate temperature, leaving a thin film of oil on the raceways, balls and cage. Oil plating is used to greatly lower torque values of oil lubricated bearings bearings and can be specified for extremely low torque applications.

Speed Factor

The maximum usable operating speed of a grease lubricant is dependent on the type of base oil. The speed factor is a function of the bore of the bearing (d) in millimeters (mm) and the speed of the bearing (N) in revolutions per minute (RPM) where:

dN = d (bearing bore, mm) x N (RPM)

Table of fn vs Cage, Lubricant Types and Ring Rotating

	Metal Cage		Phenolic or Polyimide			
	2-Piece or Crown Type		Crown Type		Full Section Type	
Lubricant / Ring Rotating	Inner	Outer	Inner	Outer	Inner	Outer
Petroleum Oil	1.0	0.8	2.0	1.2	4.0	2.4
Synthetic Oil	1.0	0.8	2.0	1.2	4.0	2.4
Silicone Oil	0.8	0.7	0.8	0.7	0.8	0.7
Non-Channeling Grease	1.0	0.6	1.6	1.0	1.6	1.0
Channeling Grease	1.0	0.8	2.0	1.2	2.4	1.6
Silicone Grease	0.8	0.7	0.8	0.7	0.8	0.7

Operating Speed

To determine whether a particular bearing will operate satisfactorily at the required speed, multiply that bearing's value (Nmax/fn) by the proper factor taken from the fn vs Cage table shown. Note that the table takes into account lubricant and cage type. When petroleum or synthetic ester oils are used, the maximum speed Nmax is dictated by the ball cage material and design or centrifugal ball loads rather than the lubricant.

For full ball complement types, the listed Nmax values apply regardless of the lubricant type or whether the inner ring or outer ring rotates. For speed limit values Nmax, the Nmax/fn values shown in the product listings must be multiplied by the fn values tabulated above.

Type	dN	Temperature Range °F (°C)
Petroleum	600,000	-25 to +250 (-32 to +121)
Diester	400,000	-65 to +350 (-54 to +177)
Silicone	200,000	-100 to +400 (-73 to +204)
Perfluorinated Polyether	200,000	-112 to +400 (-80 to +204)

Preload and Duplex Ball Bearings

Ball Bearings are preloaded for a variety of reasons:

- To eliminate radial and axial looseness
- To reduce operating noise
- To improve positioning accuracy
- To reduce repetitive runout
- To reduce the possibility of damage from vibratory loading
- To increase life and axial capacity
- To increase stiffness

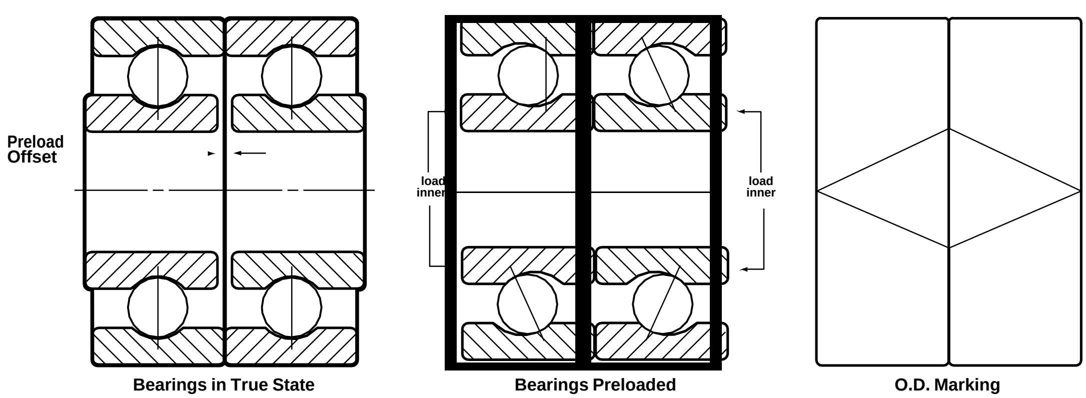
There are essentially two ways to preload a ball bearing, either by using a spring or through a solid stack of parts.

Spring preloading con consist of a coil spring or a wavy washer which applies a force against the inner or outer ring of the non-interference fitted bearing in the assembly.

Since in a spring the load is fairly consistent over a wide range of compressed length, the use of a spring for preloading eliminates the need for holding tight tolerances on machined parts. For example, retaining rings can be used in the spindle assembly, thus saving the cost of a locating shoulder, shims or threaded members. Normally a spring would not be used where the assembly must withstand reversing thrust loads.

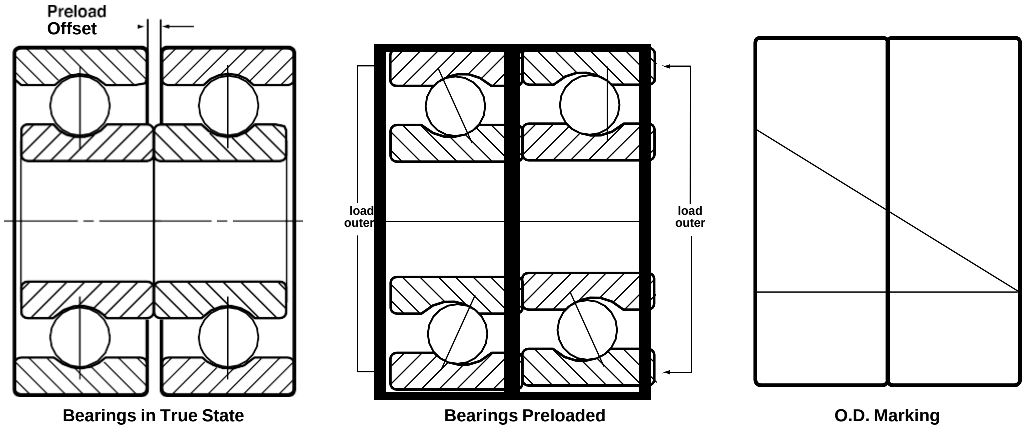
A solid stack method may be used when precise location control is required. For example, as in a precision motor, the use of built-in preload is suggested. Ball bearing with built-in preload are often referred to as duplex ball bearings. When the set of bearings is assembled, the thrust load needed to make the adjacent faces of the rings contact becomes the desired preload. Built-in preload helps satisfy the requirements of increased axial and radial stiffness and deflection control.

There are three methods of mounting preloaded duplex bearings: back-to-back, face-to-face and tandem.

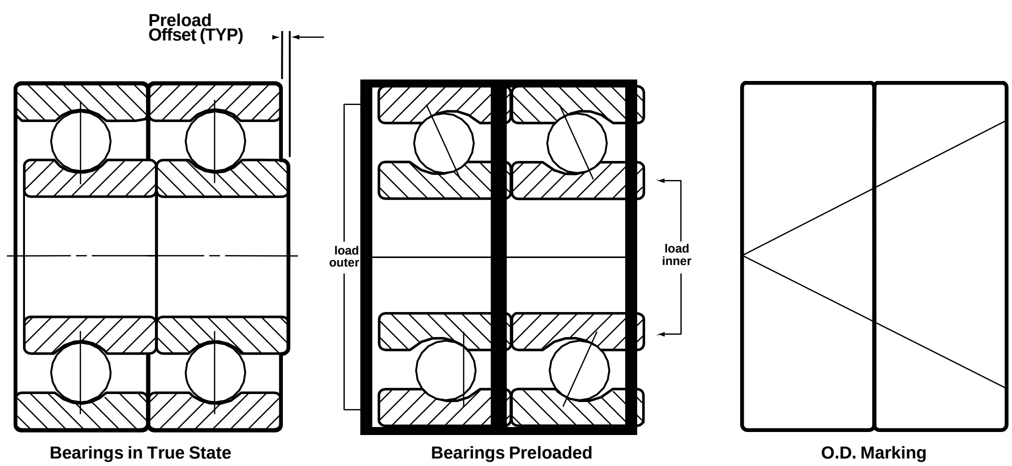


When a back-to-back (DB) duplex pair is mounted, the outer rings abut and the inner rings are drawn together, providing maximum stiffness.

Preload and Duplex Ball Bearings



When face-to-face (DF) duplex pairs are mounted, the inner rings abut and the outer rings are drawn together, providing a higher radial and axial stiffness and accommodation of misalignment.



With tandem (DT) pairs, both inner and outer rings abut and are capable of sharing a thrust load, providing increased thrust capacity.

IBSCO can provide assistance in selecting the appropriate preload specifications for your application.

Assembly & Fitting Procedure

The operating characteristics of a system can be drastically affected by the way in which the ball bearings are handled and mounted. A bearing which has been damaged due to excessive force or shock loading during assembly, or which is fitted too tight or too loose, may cause the device to perform in a substandard manner.

By following a few general guidelines during the design of mating parts and by observing some basic cautions in the assembly process, the possibility of producing malfunctioning devices will be considerably reduced.

The chart on the following page lists recommended fits for most normal situations. There are four cautions which must be observed:

1. When establishing shaft or housing sizes, the effect of differential thermal expansion must be accounted for. The Table of Recommended Fits assumes stable operating conditions, so if thermal gradients are known to be present or dissimilar materials are being used, the room temperature fits must be adjusted so that the proper fit is attained at operating temperature. Approximate thermal coefficients for common material are available from IBSCO Applications Engineering staff.

2. When miniature and instrument ball bearings are interference fitted (either intentionally or as a result of thermal gradients) the bearing radial play can be estimated to be reduced by an amount equal to 80% of the actual diametrical interference fit. This 80% figure is conservative, but is of good use for design purposes. Depending on the materials involved, this factor will typically range from 50% to 80%. The following is an example of calculating loss of radial play:

Radial Play of Bearing:	.0002"
Total Interference Fit:	.0003" Tight
80% of Interference Fit (.0003" x 80%)	.00024"
Theoretical Resultant Radial Play of Bearing	.00004" Tight

Theoretically, this bearing could be operating with negative radial play. A bearing operated in an excessive negative radial play condition will perform with reduced life. However, the above calculation is for design only, and does not take into account housing material, shaft material, or surface finish of the housing or shaft surfaces. As an example, if the finish of the shaft surface is rough, a part of the interference between the inner ring and shaft will be absorbed by the deformation of the shaft surface. This will serve to reduce the overall interference fit, and thus, the radial play of the bearing will not be reduced as much as is shown in the calculation above. If assistance on fits and their effect on bearing performance is required, please consult a member of IBSCO Applications Engineering staff.

The table of recommended fits is based on the use of bearings of ABEC 5 or better tolerance level.

3. If the outer or inner ring face is to be clamped or abutted against a shoulder, care must be taken to make sure that this shoulder configuration provides a good mounting surface:
   - The shoulder face must be perpendicular to the bearing mounting seat. The maximum permissible angle of misalignment is recommended to be 1/4°.
   - The corner between the mounting diameter and the face must have an undercut or a fillet radius no larger than that shown on the listing page under the column “Fillet Radius r”.
   - The shoulder diameter must meet the requirements shown on the table of recommended shoulder diameters.

4. Assembly technique is extremely critical. After the design is finalized and assembly procedures are being formulated, the bearing Static Capacity - C_{or} - becomes extremely important. It is easy, for instance, to exceed the 3 pound capacity of a SR09 during assembly. After assembly to the shaft, damage can be done either by direct pressure or by moment load while the bearing-and-shaft subassembly is being forced into a tight housing. A few simple calculations will underscore this point.

Adequate fixturing should always be provided for handling and assembling precision bearings. This fixturing must be designed so that, when assembling the bearing to the shaft, force is applied only to the inner ring, and, when assembling into the housing, force is applied only to the outer ring. Further, the fixturing must preclude the application of any moment or shock loads which would be transmitted through the bearing. Careful attention to this assembly phase of the total design effort can prevent many problems and provide savings when production starts. You will find our engineers eager to help in this, one of the most important phases of taking a product from design to the marketplace.

Tolerances

Table of Recommended Fits*

Typical Applications	Shaft Fit	Shaft Diameter	Housing Fit	Housing Diameter
Tape guide roller, pulley, cam follower, outer ring rotation	.0000 –.0004L	d –.0002 d –.0004	.0001L –.0003T	D –.0001 D –.0003
Drive motor (spring preload)	.0001T –.0003L	d –.0001 d –.0003	.0000 –.0004L	D +.0002 D –.0000
Precision synchro or servo	.0000 –.0002L**	d –.0001 d –.0003	.0000 –.0002L**	D +.0001 D –.0001
Potentiometer	.0001T –.0003L	d –.0001 d –.0003	.0000 –.0004L	D +.0002 D –.0000
Encoder spindle	.0000 –.0002L**	d –.0001 d –.0003	.0000 –.0002T**	D –.0001 D –.0003

** Measurement in inches.*

L = Loose Fit
T = Tight Fit
d = Bearing bore

D = Bearing OD as listed
*** Bearings must be purchased with bore & OD coding*

EXAMPLE: To use SR2 bearing in a potentiometer the shaft diameter should be .1250 -.0001 to .1250 -.0003 or .1249 to .1247. The Housing should be .3750 +.0002 to .3750 -.0000 or .3752 to .3750

Basic Size	Minimum Shaft Shoulder Diameter	Maximum Housing Shoulder Diameter
SR09	.060	.105
SR0	.071	.132
SR1	.079	.164
SR1-4	.102	.226
SR133	.114	.168
SR1-5	.122	.284
SR144	.148	.226
SR2-5	.153	.284
SR2-6	.153	.347
SR2	.179	.325
SR2A	.179	.446
SR155	.180	.288
S634	.210	.580
SR156	.210	.288
SR166	.216	.347
SR3	.244	.446
SR1650	.250	.580
SR1950	.250	.700
SR1960	.290	.700
SR168	.272	.352

Basic Size	Minimum Shaft Shoulder Diameter	Maximum Housing Shoulder Diameter
SR188	.284	.466
SR4	.310	.565
SR4A	.322	.678
SR2270	.325	.810
SR2280	.370	.810
SR2690	.420	.950
SR1810	.347	.466
SR620	.435	.565
SR6	.451	.799
SR2610	.470	.950
SR824	.560	.690
SR8	.625	1.025
SR1028	.665	.835
SR1232	.790	.960
SR1436	.160	.710

** Measurement in inches.*

Inner Ring*

Characteristic	ABEC 1	ABEC 3P	ABEC 5P	ABEC 7P	ABEC 9P
Bore Tolerance Limits	+.0000 –.0003	+.0000 –.0002	+.0000 –.0002	+.0000 –.0002	+.0000 –.0001
Bore 2 pt. out of Roundness	—	—	.0001	.0001	.00005
Bore Taper	—	—	.0001	.0001	.00005
Radial Runout	.0004	.0002 (1)	.00015	.0001	.00005
Width Variation	—	—	.0002	.0001	.00005
Bore Runout with Face	—	—	.0003	.0001	.00005
Race Runout with Face	—	—	.0003	.0001	.00005

Outer Ring*

Characteristic	Configuration	Size Range	ABEC 1	ABEC 3P	ABEC 5P	ABEC 7P	ABEC 9P
Mean OD Tolerance Limits	All	0-18mm (0-.7086in)	+.0000 –.0003	+.0000 –.0003	+.0000 –.0002	+.0000 –.0002	+.0000 –.0001
	All	over 18-30mm (.7086-1.1181in)	+.0000 –.0004	+.0000 –.0003	+.0000 –.0002	+.0000 –.0002	+.0000 –.00015
Maximum OD Tolerance Limits	Open	0-18mm (0-.7086in.)	+.0001 –.0004	+.0001 –.0004	+.0000 –.0002	+.0000 –.0002	+.0000 –.0001
		over 18-30mm (.7086-1.1811in)	+.0001 –.0005	+.0001 –.0004	+.0000 –.0002	+.0000 –.0002	+.0000 –.00015
	Shielded	0-18mm (0-.7086in)	+.0002 –.0005	+.0002 –.0005	+.00004 –.00024	+.00004 –.00024	— —
		over 18-30mm (.7086-1.1811in)	+.0002 –.0006	+.0002 –.0005	+.00004 –.00024	+.00004 –.00024	
OD 2 pt. out of Roundness	Open	0-18mm	—	—	.0001	.0001	.00005
	Open	over 18-30mm	—	—	.0001	.0001	.00008
	Shielded	0-30mm	—	—	.0002	.0002	—
OD Taper	All	0-18mm	—	—	.0001	.0001	.0005
	All	over 18-30mm	—	—	.0001	.0001	.0008
	Shielded	0-30mm	—	—	.0002	.0002	—
Radial Runout	All	0-18mm	.0006	.0004	.0002	.00015	.00005
	All	over 18-30mm	.0006	.0004	.0002	.00015	.0001
Width Variation	All	0-30mm	—	—	.0002	.0001	.00005
OD Runout with Face	All	0-30mm	—	—	.0003	.00015	.00005
Race Runout with Face	Plain	0-18mm	—	—	.0003	.0002	.00005
	Plain	over 18-30mm	—	—	.0003	.0002	.0001
	Flanged	0-30mm	—	—	.0003	.0003	—
Flange Width Tolerance Limits		— —	— —	+.0000 –.0020	+.0000 –.0020	+.0000 –.0020	— —
Flange Diameter Tolerance Limits		— —	— —	+.0050 –.0020	+.0000 –.0010	+.0000 –.0010	— —

Ring Width*

Characteristic	Configuration	ABEC 1	ABEC 3P	ABEC 5P	ABEC 7P	ABEC 9P
Width	Single Bearing	+.000 –.005	+.000 –.005	+.000 –.001	+.000 –.001	+.000 –.001
	Duplex Pair	— —	— —	+.000 –.015	+.000 –.015	+.000 –.015

Measurement in inches

Interchange Table - Miniature

IBSCO	NHBB	MPB	Barden	RMB	NHBB (Old)
SR09	SSRI-2	S2C	SRO-9	UL1304X	SR09
SR0	SSRI-21/2	S21/2C	SRO	UL1505X	SRO
SR0ZZ	SSRI-21/2ZZ	S21/2CHH	SROSS	ULZ1505X	SROPP
SR1	SSRI-3	S3C	SR1	R1706X	SR1
SR1ZZ	SSRI-3ZZ	S3CHH	SR1SS	Rf1706X	SR1PP
SR1-4	SSRI-4	S4C	SR1-4	R2508X	SR1-4
SR1-4ZZ	SSRI-4ZZ	S4CHH	SR1-4SS	RF2508X	SR1-4PP
SR133	SSRI-3332	S3332C	SR133	UL3006X	SR133
SR133ZZ	SSRI-3332ZZ	S3332CHH	SR133SS	ULZ3006X	SR133PP
SR1-5	SSRI-5	S5C	SR1-5	R3010X	SR1-5
SR1-5ZZ	SSRI-5ZZ	S5CHH	SR1-5SS	RF3010X	SSR1-5PP
SR144	SSRI-418	S418C	SR144	UL4008X	SR144
SR144ZZ	SSRI-418ZZ	S418CHH	SR144SS	ULZ4008X	SR144PP
SR2-5	SSRI-518	S518C	SR2-5	R4010X	SR2-5
SR2-5ZZ	SSRI-518ZZ	S518CHH	SR2-5SS	RF4010X	SR2-5PP
SR2-6	SSRI-618	S618C	SR2-6		SR2-6
SR2-6ZZ	SSRI-618ZZ	S618CHH	SR2-6SS		SR2-6PP
SR2	SSR-2	SR2C	SR2	R4012X	SR2
SR2ZZ	SSR-2ZZ	SR2CHH	SR2SS	RF4012X	SR2PP
SR2A	SSR-2A	SR2AC	SR2A		SR2A
SR2AZZ	SSR-2ZZA	SR2ACHH		SR2ASS	SR2APP
SR155	SSRI-5532	S5532C	SR155	UL5010X	SR155
SR155ZZ	SSRI-5532ZZ	S5532CHH	SR155SS	UL5010Z	SR155PP
SR156	SSRI-5632	S5632C	SR156	UL6010X	SR156
SR156ZZ	SSRI-5632ZZ	S5632CHH	SR156SS	ULZ6010X	SR156PP
SR166	SSRI-6632	S6316C	SR166	UL6012X	SR166
SR166ZZ	SSRI-6632ZZ	S6316CHH	SR166SS	ULZ6012X	SR166PP
SR3	SSR-3	SR3R	SR3	R6016X	SR3
SR3ZZ	SSR-3ZZ	SR3RHH	SR3SS	RF6016X	SR3PP
SR168	SSRI-614	S614C	SR168	UL8012X	SR168
SR168ZZ	SSRI-614ZZ	S614CHH	SR168SS	ULZ8012X	SR168PP
SR188	SSRI-814	S814C	SR188	UL8016X	SR188
SR188ZZ	SSRI-814ZZ	S814CHH	SR188SS	ULZ8016X	SR188PP
SR4	SSR-4	SR4C	SR4	R8020X	SR4
SR4ZZ	SSR-4ZZ	SR4CHH	SR4SS	RF8020X	SR4PP
SR4A	SSRI-1214	SR4AR		SR4A	SR4AD
SR4AZZ	SSRI-1214ZZ	SR4ARHH	SR4ASS		SR4APPD
SR1810	SSRI-8516	S8516R	SR1810		SR1810
SR1810ZZ	SSRI-8516ZZ	S8516RHH	SR1810SS		SR1810PP
SR6	SSRI-1438	SR6R	SR6		SR6D
SR6ZZ	SSRI-1438ZZ	SR6RHH	SR6SS		SR6PPD
SR8	SSRI-1812	SR8R	SR8		SR8D
SR8ZZ	SSRI-1812ZZ	SR8RHH	SR8SS		SR8PPD

This chart is intended as a reference only. The users should consult with the listed manufacturers' catalogs to establish dimensional interchangeability. Ball complements and load ratings may differ although dimensionally equivalent. IBSCO cannot be held responsible for any errors contained herein.

Interchange Table - Miniature

IBSCO	NHBB	MPB	Barden	RMB	NHBB (Old)
SFR09	SSRIF-2	S2FC	SFR09	ULK1304X	SFR09
SFR0	SSRIF-21/2	S21/2FC	SFR0	ULK1505X	SFR0
SFR0ZZ	SSRIF-21/2ZZ	S21/2FCHH	SFR0SS	ULKZ1505X	SFR0PP
SFR1	SSRIF-3	S3FC	SFR1	RK1706X	SFR1
SFR1ZZ	SSRIF-3ZZ	S3FCHH	SFR1SS	RKF1706X	SFR1PP
SFR1-4	SSRIF-4	S4FC	SFR1-4	RK2508X	SFR1-4
SFR1-4ZZ	SSRIF-4ZZ	S4FCHH	SFR1-4SS	RKF2508X	SFR1-4PP
SFR133	SSRIF-3332	S3332FC	SFR133	ULK3006X	SFR133
SFR133ZZ	SSRIF-3332ZZ	S3332FCHH	SFR133SS	ULKZ3006X	SFR133PP
SFR1-5	SSRIF-5	S5FC	SFR1-5	RK3010X	SFR1-5
SFR1-5ZZ	SSRIF-5ZZ	S5FCHH	SFR1-5SS	RKF3010X	SFR1-5PP
SFR144	SSRIF-418	S418FC	SFR144	ULK4008X	SFR144
SFR144ZZ	SSRIF-418ZZ	S418FCHH	SFR144SS	ULKZ4008X	SFR144PP
SFR2-5	SSRIF-518	S518FC	SFR2-5	RK4010X	SFR2-5
SFR2-5ZZ	SSRIF-518ZZ	S518FCHH	SFR2-5SS	RKF4010X	SFR2-5PP
SFR2-6	SSRIF-618	S618FC	SFR2-6		SFR2-6
SFR2-6ZZ	SSRIF-618ZZ	S618FCHH	SFR2-6SS		SFR2-6PP
SFR2	SSRF-2	SR2FC	SFR2	RK4012X	SFR2
SFR2ZZ	SSRF-2ZZ	SR2FCHH	SFR2SS	RKF4012X	SFR2PP
SFR155	SSRIF-5532	S5532FC	SFR155	ULK5010X	SFR155
SFR155ZZ	SSRIF-5532ZZ	S5532FCHH	SFR155SS	ULKZ5010X	SFR155PP
SFR156	SSRIF-5632	S5632FC	SFR156	ULK6010X	SFR156
SFR156ZZ	SSRIF-5632ZZ	S5632CHH	SFR156SS	ULKZ6010X	SFR156PP
SFR166	SSRIF-6632	S6316FC	SFR166	ULK6012X	SFR166
SFR166ZZ	SSRIF-6632ZZ	S6316FCHH	SFR166SS	ULKZ6012X	SFR166PP
SFR3	SSRF-3	SR3FC	SFR3X3		SFR3C
SFR3ZZ	SSRF-3ZZ	SR3FCHH	SFR3SS	RKF6016X	SFR3PP
SFR168	SSRIF-614	S614FC	SFR168	ULK8012X	SFR168
SFR168ZZ	SSRIF-614ZZ	S614FCHH	SFR168SS	ULKZ8012X	SFR168PP
SFR188	SSRIF-814	S814FC	SFR188	ULK8016X	SFR188
SFR188ZZ	SSRIF-814ZZ	S814FCHH	SFR188SS	ULKZ8016X	SFR188PP
SFR4	SSRF-4	SR4FC	SFR4	RK8020X	SFR4
SFR4ZZ	SSRF-4ZZ	SR4FCHH	SFR4SS	RKF8020X	SFR4PP
SFR1810	SSRIF-8516	S8516FC	SFR1810		SFR1810
SFR1810ZZ	SSRIF-8516ZZ	S8516FCHH	SFR1810SS		SFR1810PP
SFR6	SSRIF-1438	SFR6X5		SFR6DC	
SFR6ZZ	SSRIF-1438ZZ	SR6FRHH	SFR6SS		SFR6PPD
SFR8	SSRIF-1812	SR8FR	SFR8		SFR8
SFR8ZZ	SSRIF-1812ZZ	SR8FRHH	SFR8SS		SFR8PPD

This chart is intended as a reference only. The users should consult with the listed manufacturers' catalogs to establish dimensional interchangeability. Ball complements and load ratings may differ although dimensionally equivalent. IBSCO cannot be held responsible for any errors contained herein.

Interchange Table - Thin Section

IBSCO	NHBB	MPB	IBSCO	NHBB	MPB
THIN SECTION - RADIAL			***THIN SECTION - ANGULAR CONTACT***		
SR620K (ZK)	SSRI-1038KC (ZKC)	S610MC (MCH)	**SAR620K**	SSMDRI-1038KC	S610M
SR620ZZ	SSRI-1038ZZ	S610MCKHH			
SR824K (ZK)	SSRI-1212KC (ZKC)	S812MC (MCH)	**SAR824K**	SSMDRI-1212KC	S812M
SR824ZZ	SSRI-1212ZZ	S812MCKHH			
SR1028K (ZK)	SSRI-1458KC (ZKC)	S1014MC (MCH)	**SAR1028K**	SSMDRI-1458KC	S1014M
SR1028ZZ	SSRI-1458ZZ	S1014MCKHH			
SR1232K (ZK)	SSRI-1634KC (ZKC)	S1216MC (MCH)	**SAR1232K**	SSMDRI-1634KC	S1216M
SR1232ZZ	SSRI-1634ZZ	S12116MCKHH			
SR1436K (ZK)	SSRI-1878KC (ZKC)	S1418MC (MCH)	**SAR1436K**	SSMDRI-1878KC	S1418M
SR1436ZZ	SSRI-1878ZZ	S1418MCKHH			
SR1742K (ZK)	SSRI-2117KC (ZKC)	S1721MC (MCH)	**SAR1742K**	SSMDRI-2117KC	S1721M
SR1742ZZ	SSRI-2117ZZ	S1721MCKHH			
SR2048K (ZK)	SSRI-2420KC (ZKC)	S2024MC (MCH)	**SAR2048K**	SSMDRI-2420KC	S2024M
SR2048ZZ	SSRI-2420ZZ	S2024MCKHH			
SR2252K (ZK)	SSRI-2622KC (ZKC)	S2226MC (MCH)	**SAR2252K**	SSMDRI-2622KC	S2226M
SR2252ZZ	SSRI-2622ZZ	S2226MCKHH			
SR2456K (ZK)	SSRI-2824KC (ZKC)	S2428MC (MCH)	**SAR2456K**	SSMDRI-2824KC	S2428M
SR2456ZZ	SSRI-2824ZZ	S2428MCKHH			
SR2660K (ZK)	SSRI-3026KC (ZKC)	S2630MC (MCH)	**SAR2660K**	SSMDRI-3026KC	S2630M
SR2660ZZ	SSRI-3026ZZ	S2630MCKHH			
TORQUE TUBE - RADIAL			***TORQUE TUBE - ANGULAR CONTACT***		
SR538K (ZZK)	SSRI-538KC (ZZKC)	S1017MC (MCHH)	**SAR538K**	SSMERI-538KC	S1017M
SR538EEK (ZZEEK)	SSRI-538EEKC (ZZEEKC)	S1017MCE (MCEHH)	**SAR538EEKC**	SSMERI-538EEKC	S1017ME
SR539K (ZZK)	SSRI-539KC (ZZKC)	S1219MC (MCHH)	**SAR539K**	SSMERI-539KC	S1219M
SR539EEK (ZZEEK)	SSRI-539EEKC (ZZEEKC)	S1219MCE (MCEHH)	**SAR539EEKC**	SSMERI-539EEKC	S1219ME
SR540K (ZZK)	SSRI-540KC (ZZKC)	S1421MC (MCHH)	**SAR540K**	SSMERI-540KC	S1421M
SR540EEK (ZZEEK)	SSRI-540EEKC (ZZEEKC)	S1421MCE (MCEHH)	**SAR540EEKC**	SSMERI-540EEKC	S1421ME
SR541K (ZZK)	SSRI-541KC (ZZKC)	S1724MC (MCHH)	**SAR541K**	SSMERI-541KC	S1724M
SR541EEK (ZZEEK)	SSRI-541EEKC (ZZEEKC)	S1724MCE (MCEHH)	**SAR541EEKC**	SSMERI-541EEKC	S1724ME
SR542K (ZZK)	SSRI-542KC (ZZKC)	S2128MC (MCHH)	**SAR542K**	SSMERI-542KC	S2128M
SR542EEK (ZZEEK)	SSRI-542EEKC (ZZEEKC)	S2128MCE (MCEHH)	**SAR542EEKC**	SSMERI-542EEKC	S2128ME
SR543K (ZZK)	SSRI-543KC (ZZKC)	S2532MC (MCHH)	**SAR543K**	SSMERI-543KC	S2532M
SR543EEK (ZZEEK)	SSRI-543EEKC (ZZEEKC)	S2532MCE (MCEHH)	**SAR543EEKC**	SSMERI-543EEKC	S2532ME
SR544K (ZZK)	SSRI-544KC (ZZKC)	S2936MC (MCHH)	**SAR544K**	SSMERI-544KC	S2936M
SR544EEK (ZZEEK)	SSRI-544EEKC (ZZEEKC)	S2936MCE (MCEHH)	**SAR544EEKC**	SSMERI-544EEKC	S2936ME
SR545K (ZZK)	SSRI-545KC (ZZKC)	S3342MC (MCHH)	**SAR545K**	SSMERI-545KC	S3342M
SR545EEK (ZZEEK)	SSRI-545EEKC (ZZEEKC)	S3342MCE (MCEHH)	**SAR545EEKC**	SSMERI-545EEKC	S3342ME
SR546K (ZZK)	SSRI-546KC (ZZKC)	S3746MC (MCHH)	**SAR546K**	SSMERI-546KC	S3746M
SR546EEK (ZZEEK)	SSRI-546EEKC (ZZEEKC)	S3746MCE (MCEHH)	**SAR546EEKC**	SSMERI-546EEKC	S3746ME
SR547K (ZZK)	SSRI-547KC (ZZKC)	S4152MC (MCHH)	**SAR547K**	SSMERI-547KC	S4152M
SR547EEK (ZZEEK)	SSRI-547EEKC (ZZEEKC)	S4152MCE (MCEHH)	**SAR547EEKC**	SSMERI-547EEKC	S4152ME
SR548K (ZZK)	SSRI-548KC (ZZKC)	S4556MC (MCHH)	**SAR548K**	SSMERI-548KC	S4556M
SR548EEK (ZZEEK)	SSRI-548EEKC (ZZEEKC)	S4556MCE (MCEHH)	**SAR548EEKC**	SSMERI-548EEKC	S4556ME
SR549K (ZZK)	SSRI-549KC (ZZKC)	S4962MC (MCHH)	**SAR549K**	SSMERI-549KC	S4962M
SR549EEK (ZZEEK)	SSRI-549EEKC (ZZEEKC)	S4962MCE (MCEHH)	**SAR549EEKC**	SSMERI-549EEKC	S4962ME

INTERCONTINENTAL BEARING

Terms & Conditions

Price - Contact IBSCO for current pricing. Pricing in effect at time of shipment. Prices do not include sales, use, excise, value-added or similar taxes.

Payment Terms -
1. Net 30 days: subject to credit approval
2. Credit Cards: AMEX, Mastercard, Visa
3. COD on approval (US$ 100.00 maximum)
4. International Sales: Letter of Credit - Wire Transfer - Prepayment through US Bank

Minimum Order - US$ 25.00 for shelf items.
US$ 50.00 for items requiring clean room services.

Quotations - Verbal quotations are subject to immediate acceptance, and are valid for 30 days. Where longer validity is required, a written quotation must be issued.

Prior Sale - All merchandise quoted is subject to prior sale.

Shipment Method - Method of shipment is per buyer’s specification.

Freight Expense - All merchandise is sold F.O.B. shipping point.

Shortage Claims - Claims for shortage not resulting from damage in transit must be made within 10 days of receipt of merchandise.

Cancellations - Orders are not subject to cancellation without Seller’s consent, and may be subject to cancellation charges.

Rescheduling - Orders are not subject to rescheduling without Seller’s consent, and may be subject to rescheduling charges.

Returns - No return will be accepted without Seller’s consent and issuance of a Return Goods Authorization (RGA) number. All unauthorized returns will be returned to the Buyer at the Buyer’s expense. Authorized returns may be subject to restocking charges. All claims must be made within 45 days of receipt, and goods must be returned within 30 days of issuance of RGA. Goods must be returned in marketable condition. Goods returned in an unsaleable condition will be returned to Buyer freight collect.

Limited Warranty - Seller warrants that merchandise sold by it will be free from defects in material and workmanship at time of shipment by Seller. Seller warranty does not apply to any product which has been subjected to misuse, mishandling, improper storage, misapplication, neglect (including but not limited to improper maintenance), accident, improper installation, improper mounting, improper lubrication, modification or adjustment or repair performed by anyone other than the Seller or Seller’s authorized agents.

Any claim by Buyer with reference to the goods sold shall be deemed waived by the Buyer unless submitted to the Seller within ten (10) days from the date Buyer discovered or by reasonable inspection should have been discovered, any claimed breach of the foregoing warranty. Any cause of action for breach of the foregoing warranty must be brought within twelve (12) months from date of shipment of such goods by Seller.

Disclaimer - In no event shall Seller be liable to the Buyer, any successors in interest or any beneficiary of an order for contingent or consequential damages of any kind, including without limitation, breach of any obligation imposed on Seller hereunder or in connection herewith. Contingent or consequential damages for purpose hereof shall include, without limitation, loss of use, loss of income or profit, losses sustained as a result of injury or death to any person, and loss of or damage to property including without limitation property affected by the use of the goods. Buyer shall indemnify Seller against all liability, cost or expense which may be sustained by Seller on account of any such loss, damage or injury.

The delivery of products or services from this catalog constitutes Buyer’s acceptance of the above Terms and Conditions.

Miniature & Instrument Bearings

Detailed in this catalog, **IBSCO** is the largest **Authorized Distributor** for both ***NMB*** and ***NHBB*** miniature & Instrument ball bearings. **IBSCO** inventories vast stocks at all times, in virtually every configuration.

Machine Tool Spindle Bearings

Radial or angular contact high-speed, super precision, phenolic retainer machine tool spindle bearings. Manufactured in ABEC's 5, 7 and 9, and available with optional ceramic balls.

Stainless Steel Bearings

IBSCO maintains one of the worlds most complete inventories of precision bearings in 400 series stainless steel, as well as ***NMB***'s proprietary "DD" stainless steel.

Bearing Re-lubrication

As an **Authorized Lubrication Center** for both ***NMB*** and ***NHBB***, with hundreds of specialty lubricants in stock, **IBSCO**'s clean room re-lubrication facility is certified annually to Federal Standard 209.

ISO9002:1994

ISO 9001 Quality

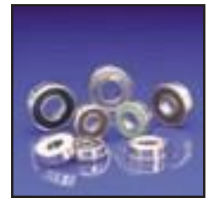
A forerunner in the quality arena, IBSCO is ISO9001 certified. Our commitment to quality is how IBSCO is able to maintain a customer satisfaction index of 99.7%.

NHBB *Bearings*

IBSCO is the largest **Authorized Distributor** for **New Hampshire Ball Bearing** miniature and instrument bearings, as well as being an ***NHBB* Authorized** Lubrication Center.

Thin Section & Torque Tube Bearings

Thin and Extra Thin section bearings are available in inch or metric sizes, in chrome or stainless steel. These ranges are also available with phenolic cages for high speed applications, and with extended inner rings.



Electric Motor Bearings

Electric motor quality bearings, in inch or metric sizes, lubricated to meet your specific needs. This series of bearings exhibit the low noise and vibration levels required in electric motor applications.

Needle and Linear Bearings & Slides

INA, ***IKO***, ***NB*** & ***THK*** brand needle and linear bearings and slides, including miniature sizes. **IBSCO** can custom lubricate this product range to meet the low vacuum environment present in chip manufacturing.

Medical and Dental Bearings

IBSCO is a major supplier of high speed bearings for medical and dental applications. ***NHBB*** high speed bearings can sustain speeds of 500,000 rpm! Even faster with optional ceramic balls.

Precision Mechanical Assemblies

Speed up and improve production with high quality custom designed rotating mechanical assemblies. These cost saving solutions eliminate tolerance stack up and control runouts, while reducing inventory items.

NMB Bearings

IBSCO is the largest **Authorized Distributor** for ***NMB*** brand miniature and instrument bearings. With factories in Japan, Thailand and Singapore, ***NMB*** bearings are unequaled for quality & value.

NMB CORPORATION

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