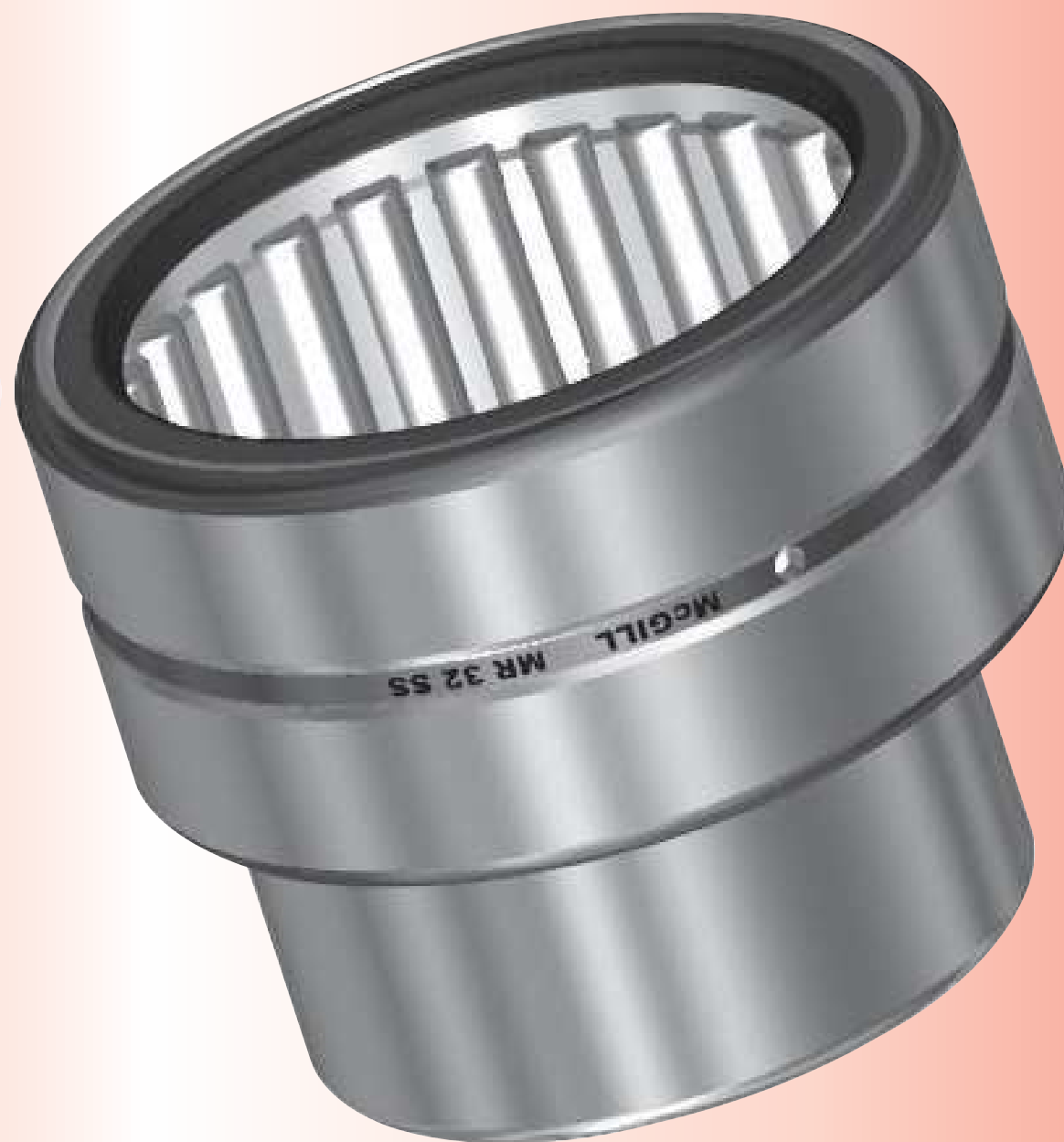






Needle

Unmounted bearing assembly consisting of through hardened precision machined inner and outer raceways with either full complement or separated (cage) needle rolling elements. Depending on the bearing configuration the retainer can be land or roller riding and available with several seal options. Machined race needle bearings provide an antifriction solution when supporting rotating shafts with radial loads.

Bearing Configurations

Separable Or Non-Separable Inner/Outer Raceway

Shaft Diameter Range

1/2" To 9 1/4" And 15 mm To 235 mm

Materials

Bearing Quality Steel

Needle Selection Guide



				SIZE RANGE	
		Product Series	Material / Roller Complement	Inch	Metric Equiv.
CAGEROL		MR	Bearing Steel Caged Needle Roller	5/8" - 9 1/4"	16 - 235
		MR Sealed		5/8" - 4 1/4"	16 - 108
		MR Narrow		5/8" - 6 1/2"	16 - 165
GUIDEROL		GR	Bearing Steel Full Complement Center Guided Needle Roller	1/2" - 9 1/4"	13 - 235
		GR Sealed		5/8" - 4 1/4"	16 - 108
		GR Narrow		5/8" - 6 1/2"	16 - 165
MULTI-ROL		RS	Bearing Steel Full Complement Needle Roller	3/4" - 3"	19 - 76
		RD		1 1/4" - 4"	32 - 102
Journal		200 Series	Bearing Steel Caged Roller	1 3/16" - 8 5/8"	30 - 220
		300 Series		1" - 5 3/16"	25 - 130

Metric dimensions are for reference only.
Listed needle roller bearings are manufactured to inch dimensions.

* For estimating purpose only, individually sizes may vary and are subject to change without notification



Needle Bearings **ROLLWAY® MCGILL®**

Needle/Journal Bearings



Design Characteristics						Features								
Limited Radial Space	Dynamic Load Rating	Static Load Rating	Oscillating Capability	High Speed	Relative Base Cost *	Separable Inner Race	Double Row	Oil Holes	Rubber Lip Seal	Metallic Shield	DS Matching	Separable Outer	Page No.	
●	●	◐	◐	●	\$	O	-	S	-	-	O	-	C-9	
●	●	◐	◐	◐	\$	O	-	S	S	-	O	-	C-9	
●	●	◐	◐	●	\$	O	-	S	-	-	O	-	C-9	
●	●	●	●	◐	\$\$\$	O	-	S	-	-	O	-	C-21	
●	◐	◐	●	○	\$\$\$	O	-	S	S	-	O	-	C-21	
●	◐	◐	●	◐	\$\$\$	O	-	S	-	-	O	-	C-21	
●	●	●	●	◐	\$\$	-	-	S	-	S	O	-	C-33	
●	●	●	●	◐	\$\$	-	S	S	-	S	O	-	C-34	
◐	●	●	◐	◐	\$\$\$	O	-	S	-	-	-	S	C-37	
◐	●	●	◐	◐	\$\$\$	O	-	S	-	-	-	S	C-37	

Utilize Mi Inner Rings For Installations On Unhardened Shafts

Higher Radial Loads

Relubrication To Help Promote Long Operating Life

Contamination Barrier Lubrication Retention

Elevated Temperature Applications (When Applied With Suitable Lubricant)

Recommended For Load Sharing When Mounting Bearing Pairs

Available As Complete Assembly Or Individual Components

O = Optional

S = Standard

○ = Not Recommended

◐ ◑ ◒ ◓ ◔

Poor ← → **Best**

Note: Cost ranges are approximate in the secondary dimension

McGill Machined Inner Ring

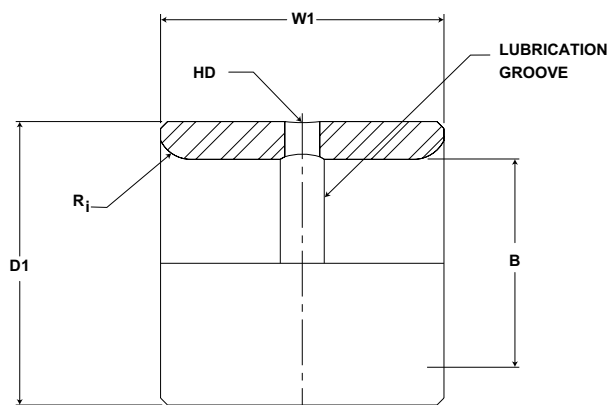
Precision ground inner ring provides a hardened raceway for the rollers when used with an unhardened shaft. The ring contains an oil hole and annular groove for relubrication of the bearing and can be used with both CAGEROL and GUIDEROL bearings or can be utilized as a bushing in plain bearing applications.

Needle/Journal Bearings



Basic Construction Type: Thru Hardened Precision Ground Rings

Ring Material: Bearing Quality Steel



MI Series

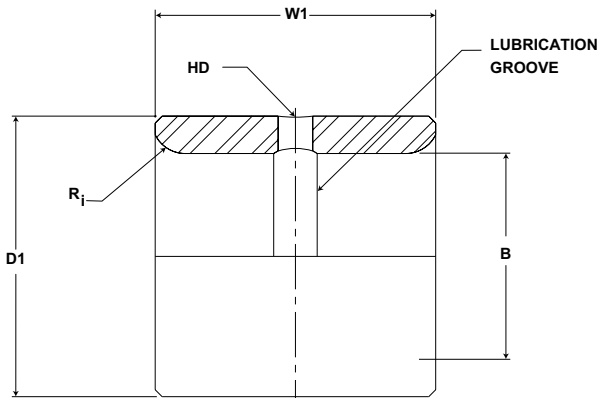
Part No.	Military No.	B		D1		W1	Ri	Recommended Shaft Diameter with Inner Ring			Inner Weight
		Bore Diameter		Outside Diameter		Width	Inner Ring Corner				
		inch	mm	inch	mm	inch	mm	inch			lb
Inner Ring		Nom	Tol.	Nom	Tol.	Tol +0/-.005 (+0/.13)	(Ref)	Rotating	Stationary	Tol.	kg
MI 6 N	MS 51962-1	.3750	+0/-.0004	.6245	+0/-.0004	.760	.25	.3755	.3747	+0/-.0005	.05
		9.5	+0/-.010	15.9	+0/-.010	19.3	6	9.5	9.5	+0/-.013	.02
MI 6						1.010	.25	.3755	.3747	+0/-.0005	.05
						25.7	6	9.5	9.5	+0/-.013	.02
MI 7 N		.4375	+0/-.0004	.6245	+0/-.0004	.760	.25	.4380	.4372	+0/-.0005	.04
		11.1	+0/-.010	15.9	+0/-.010	19.3	6	11.1	11.1	+0/-.013	.02
MI 8 N	MS 51962-2	.5000	+0/-.0004	.7493	+0/-.0005	.760	.40	.5005	.4997	+0/-.0005	.04
		12.7	+0/-.010	19.0	+0/-.013	19.3	10	12.7	12.7	+0/-.013	.02
MI 8	MS 51962-3					1.010	.40	.5005	.4997	+0/-.0005	.06
						25.7	10	12.7	12.7	+0/-.013	.03
MI 9 N		.5625	+0/-.0004	.7493	+0/-.0005	.760	.40	.5630	.5622	+0/-.0005	.04
		14.3	+0/-.010	19.0	+0/-.013	19.3	10	14.3	14.3	+0/-.013	.02
MI 10		.6250	+0/-.0004	.8743	+0/-.0005	1.010	.40	.6255	.6247	+0/-.0005	.08
		15.9	+0/-.010	22.2	+0/-.013	25.7	10	15.9	15.9	+0/-.013	.04
MI 10 N	MS 51962-4					.760	.40	.6255	.6247	+0/-.0005	.06
						19.3	10	15.9	15.9	+0/-.013	.03
MI 11 N		.6875	+0/-.0004	.8743	+0/-.0005	.760	.40	.6880	.6872	+0/-.0005	.05
		17.5	+0/-.010	22.2	+0/-.013	19.3	10	17.5	17.5	+0/-.013	.02
MI 12 N	MS 51962-5	.7500	+0/-.0004	.9993	+0/-.0005	.760	.40	.7505	.7497	+0/-.0005	.07
		19.1	+0/-.010	25.4	+0/-.013	19.3	10	19.1	19.0	+0/-.013	.03
MI 12						1.010	.40	.7505	.7497	+0/-.0005	.10
						25.7	10	19.1	19.0	+0/-.013	.05
MI 13 N	MS 51962-6	.8125	+0/-.0005	.9993	+0/-.0005	.760	.40	.8129	.8121	+0/-.0005	.07
		20.6	+0/-.013	25.4	+0/-.013	19.3	10	20.7	20.6	+0/-.013	.03
MI 13	MS 51962-7					1.010	.40	.8130	.8122	+0/-.0005	.11
						25.7	10	20.7	20.6	+0/-.013	.05
MI 14 N	MS 51962-8	.8750	+0/-.0005	1.124	+0/-.0005	1.010	.40	.8754	.8746	+0/-.0005	.11
		22.2	+0/-.013	28.6	+0/-.013	25.7	10	22.2	22.2	+0/-.013	.05
MI 14						1.260	.40	.8755	.8747	+0/-.0005	.13
						32.0	10	22.2	22.2	+0/-.013	.06
MI 14 N	MS 51962-8	.8750	+0/-.0005	1.124	+0/-.0005	1.010	.40	.9379	.9371	+0/-.0005	.11
		22.2	+0/-.013	28.6	+0/-.013	25.7	10	23.8	23.8	+0/-.013	.05
MI 15						1.260	.40	.9380	.9372	+0/-.0005	.12
						32.0	10	23.8	23.8	+0/-.013	.05

Metric dimensions for reference only.

Not all parts are available from stock. Please contact customer service for availability (800) 626-2120.

For more information on bearing capabilities outside of our standard offering, please contact Application Engineering (800) 626-2093.

Machined Inner Rings **McGILL®**



MI Series

Part No.	Military No.	B		D1		W1	Ri	Recommended Shaft Diameter with Inner Ring			Inner Weight
		Bore Diameter		Outside Diameter		Width	Inner Ring Corner				lb kg
		inch mm		inch mm		inch mm		inch mm			
Inner Ring		Nom	Tol.	Nom	Tol.	Tol +0/-0.005 (+0/-0.13)	(Ref)	Rotating	Stationary	Tol.	
MI 16 N	MS 51962-10	1.000	+0/-0.0005	1.249	+0/-0.0006	1.010	.40	1.0004	.9996	+0/-0.0005	.13
MI 16	MS 51962-11	25.4	+0/-0.013	31.7	+0/-0.015	25.7	10	25.4	25.4	+0/-0.013	.06
MI 17		1.063	+0/-0.0005	1.374	+0/-0.0006	1.260	.40	1.001	1.000	+0/-0.0005	.16
MI 17		27.0	+0/-0.013	34.9	+0/-0.015	32.0	10	25.4	25.4	+0/-0.013	.07
MI 18 N	MS 51962-12	1.125	+0/-0.0005	1.374	+0/-0.0006	1.260	.40	1.063	1.0621	+0/-0.0005	.16
MI 18	MS 51962-13	28.6	+0/-0.013	34.9	+0/-0.015	32.0	10	27.0	27.0	+0/-0.013	.07
MI 19	MS 51962-14	1.188	+0/-0.0005	1.499	+0/-0.0006	1.260	.06	1.1255	1.1246	+0/-0.0005	.14
MI 19	MS 51962-14	30.2	+0/-0.013	38.1	+0/-0.015	32.0	2	28.6	28.6	+0/-0.013	.06
MI 20 N	MS 51962-15	1.250	+0/-0.0005	1.499	+0/-0.0006	1.260	.06	1.126	1.125	+0/-0.0005	.17
MI 20	MS 51962-16	31.8	+0/-0.013	38.1	+0/-0.015	32.0	2	28.6	28.6	+0/-0.013	.08
MI 21 N	MS 51962-17	1.313	+0/-0.0005	1.624	+0/-0.0006	1.260	.06	1.188	1.1871	+0/-0.0005	.24
MI 21		33.4	+0/-0.013	41.3	+0/-0.015	32.0	2	30.2	30.2	+0/-0.013	.11
MI 22 4S	MS 51962-18	1.375	+0/-0.0005	1.624	+0/-0.0006	1.260	.06	1.2505	1.2496	+0/-0.0005	.19
MI 22	MS 51962-19	34.9	+0/-0.013	41.3	+0/-0.015	32.0	2	31.8	31.8	+0/-0.013	.09
MI 23	MS 51962-20	1.438	+0/-0.0005	1.749	+0/-0.0006	1.260	.06	1.251	1.250	+0/-0.0005	.22
MI 23	MS 51962-20	36.5	+0/-0.013	44.4	+0/-0.015	32.0	2	31.8	31.8	+0/-0.013	.09
MI 24 N	MS 51962-21	1.500	+0/-0.0005	1.749	+0/-0.0006	1.260	.06	1.313	1.3121	+0/-0.0005	.20
MI 24	MS 51962-22	38.1	+0/-0.013	44.4	+0/-0.015	32.0	2	33.4	33.3	+0/-0.013	.09
MI 25 4S		1.563	+0/-0.0005	1.874	+0/-0.0006	1.260	.06	1.313	1.312	+0/-0.0005	.26
MI 25		39.7	+0/-0.013	47.6	+0/-0.015	32.0	2	33.4	33.3	+0/-0.013	.12
MI 26 N	MS 51962-23	1.625	+0/-0.0005	1.999	+0/-0.0007	1.260	.06	1.3755	1.3746	+0/-0.0005	.20
MI 26						34.9	34.9	+0/-0.013	.09		
MI 26 2S						1.749	.06	1.376	1.375	+0/-0.0005	.26
MI 27 N						44.4	2	35.0	34.9	+0/-0.013	.12
MI 27		1.438	+0/-0.0005	1.749	+0/-0.0006	1.260	.06	1.438	1.4371	+0/-0.0005	.27
MI 27		36.5	+0/-0.013	44.4	+0/-0.015	32.0	2	36.5	36.5	+0/-0.013	.12
MI 28 N	MS 51962-24	1.688	+0/-0.0005	1.999	+0/-0.0007	1.010	.06	1.5005	1.4996	+0/-0.0005	.22
MI 28	MS 51962-25	42.9	+0/-0.013	50.8	+0/-0.018	25.7	2	38.1	38.1	+0/-0.013	.09
MI 29 4S		1.688	+0/-0.0005	1.874	+0/-0.0006	1.260	.06	1.501	1.500	+0/-0.0005	.22
MI 29		42.9	+0/-0.013	47.6	+0/-0.015	32.0	2	38.1	38.1	+0/-0.013	.09
MI 30 N	MS 51962-26	1.688	+0/-0.0005	1.999	+0/-0.0007	1.260	.06	1.563	1.5621	+0/-0.0005	.27
MI 30						32.0	2	39.7	39.7	+0/-0.013	.12
MI 30 2S						1.563	.06	1.563	1.562	+0/-0.0005	.30
MI 31 N						39.7	2	39.7	39.7	+0/-0.013	.14
MI 32 N	MS 51962-27	1.625	+0/-0.0005	1.999	+0/-0.0007	1.010	.06	1.6255	1.6246	+0/-0.0005	.30
MI 32						25.7	2	41.3	41.3	+0/-0.013	.14
MI 32 2S						1.260	.06	1.6255	1.6246	+0/-0.0005	.38
MI 33 N						32.0	2	41.3	41.3	+0/-0.013	.17
MI 34 N	MS 51962-28	1.936	0/-0.0007	1.260	+0/-0.018	1.260	.06	1.6255	1.625	+0/-0.0005	.30
MI 34						32.0	2	41.3	41.3	+0/-0.013	.14
MI 35 N						1.010	.06	1.688	1.6871	+0/-0.0005	.30
MI 35						25.7	2	42.9	42.9	+0/-0.013	.14
MI 36 N	MS 51962-29	1.688	+0/-0.0005	1.999	+0/-0.0007	1.260	.06	1.688	1.687	+0/-0.0005	.32
MI 36						32.0	2	42.9	42.9	+0/-0.013	.15
MI 36 2S						1.688	.06	1.688	1.687	+0/-0.0005	.32
MI 37 N						42.9	2	42.9	42.9	+0/-0.013	.15

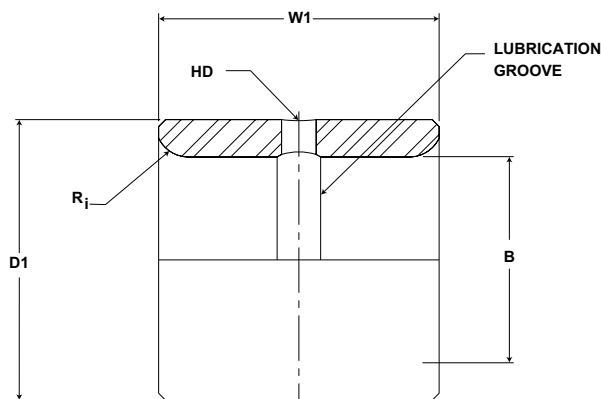
McGILL® Machined Inner Rings

Needle/Journal Bearings



Basic Construction Type: Thru Hardened Precision Ground Rings

Bearing Material: Bearing Quality Steel



MI Series (continued)

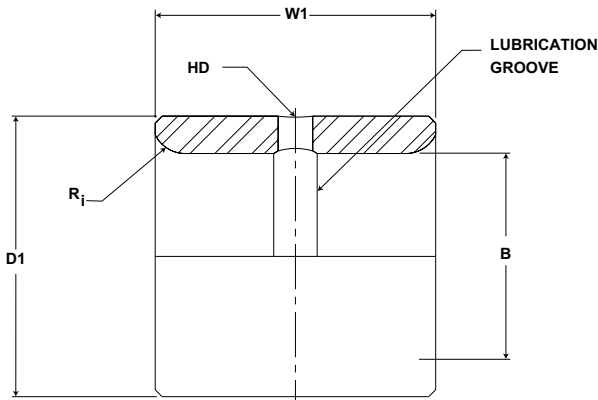
Part No.	Military No.	B		D1		W1	Ri	Recommended Shaft Diameter with Inner Ring			Inner Weight
		Bore Diameter		Outside Diameter		Width	Inner Ring Corner				
		inch mm		inch mm		inch mm		inch mm			lb kg
Inner Ring		Nom	Tol.	Nom	Tol.	Tol +0/-.005 (+0/.13)	(Ref)	Rotating	Stationary	Tol.	
MI 27 N		1.688 42.9	+0/-.0005 +0/-.013	1.999 50.8	+0/-.0007 +0/-.018	1.010 25.7	.06 2	1.688 42.9	1.6871 42.9	+0/-.0005 +0/-.013	.32 .15
MI 28	MS 51962-25					1.760 44.7	.06 2	1.751 44.5	1.750 44.5	+0/-.0005 +0/-.013	.63 .29
MI 30		1.875 47.6	+0/-.0005 +0/-.013	2.249 57.1	+0/-.0007 +0/-.018	1.760 44.7	.06 2	1.8755 47.7	1.8746 47.6	+0/-.0005 +0/-.013	.85 .39
MI 31	MS 51962-26	1.938 49.2	+0/-.0005 +0/-.013	2.249 57.1	+0/-.0007 +0/-.018	1.510 38.4	.08 2	1.938 49.2	1.9371 49.2	+0/-.0005 +0/-.013	.97 .43
MI 32 N	MS 51962-27	2.000 50.8	+0/-.0005 +0/-.013	2.249 57.1	+0/-.0007 +0/-.018	1.510 38.4	.08 2	2.0005 50.8	1.9996 50.8	+0/-.0005 +0/-.013	.74 .33
MI 32						1.760 44.7	.08 2	2.001 50.8	2.000 50.8	+0/-.0005 +0/-.013	.87 .39
MI 34		2.125 54.0	+0/-.0006 +0/-.015	2.249 57.1	+0/-.0007 +0/-.018	1.760 44.7	.08 2	2.1258 54.0	2.1247 54.0	+0/-.0008 +0/-.020	1.00 .45
MI 35	MS 51962-28	2.188 55.6	+0/-.0006 +0/-.015	2.749 69.8	+0/-.0007 +0/-.018	1.510 38.4	.08 2	2.1883 55.6	2.1872 55.6	+0/-.0008 +0/-.020	1.06 .48
MI 36 N	MS 51962-29	2.250 57.2	+0/-.0006 +0/-.015	2.749 69.8	+0/-.0007 +0/-.018	1.510 38.4	.08 2	2.2508 57.2	2.2497 57.2	+0/-.0008 +0/-.020	.83 .37
MI 36						1.760 44.7	.08 2	2.2508 57.2	2.2497 57.2	+0/-.0008 +0/-.020	.97 .44
MI 38	MS 51962-30	2.375 60.3	+0/-.0006 +0/-.015	2.999 76.2	+0/-.0007 +0/-.018	1.760 44.7	.08 2	2.3758 60.4	2.3747 60.3	+0/-.0008 +0/-.020	1.28 .58
MI 39		2.438 61.9	+0/-.0006 +0/-.015	2.999 76.2	+0/-.0007 +0/-.018	1.510 38.4	.08 2	2.4383 62.0	2.4372 61.9	+0/-.0008 +0/-.020	1.05 .47
MI 40 N	MS 51962-31	2.500 63.5	+0/-.0006 +0/-.015	2.999 76.2	+0/-.0007 +0/-.018	1.510 38.4	.08 2	2.5008 63.5	2.4997 63.5	+0/-.0008 +0/-.020	.92 .43
MI 40						1.760 44.7	.08 2	2.501 63.5	2.500 63.5	+0/-.0008 +0/-.020	1.07 .48
MI 42		2.625 66.7	+0/-.0006 +0/-.015	3.249 82.5	+0/-.0009 +0/-.023	1.760 44.7	.08 2	2.6258 66.7	2.6247 66.7	+0/-.0008 +0/-.020	1.12 .51
MI 44	MS 51962-32	2.750 69.9	+0/-.0006 +0/-.015	3.249 82.5	+0/-.0009 +0/-.023	1.760 44.7	.08 2	2.7508 69.9	2.7497 69.9	+0/-.0008 +0/-.020	1.17 .53
MI 46		2.875 73.1	+0/-.0006 +0/-.015	3.499 88.9	+0/-.0009 +0/-.023	2.010 51.1	.08 2	2.8758 73.1	2.8747 73.0	+0/-.0008 +0/-.020	1.30 .59
MI 47	MS 51962-34	2.938 74.6	+0/-.0006 +0/-.015	3.499 88.9	+0/-.0009 +0/-.023	2.010 51.1	.08 2	2.9383 74.7	2.9372 74.6	+0/-.0008 +0/-.020	1.58 .72
MI 48 N		3.000 76.2	+0/-.0006 +0/-.015	3.499 88.9	+0/-.0009 +0/-.023	1.760 44.7	.08 2	3.0008 76.3	2.9997 76.2	+0/-.0008 +0/-.020	1.32 .59
MI 48						2.010 51.1	.08 2	3.001 76.3	3.000 76.2	+0/-.0008 +0/-.020	1.43 .65
MI 50	MS 51962-35	3.125 79.4	+0/-.0006 +0/-.015	3.749 95.3	+0/-.0009 +0/-.023	2.010 51.1	.10 3	3.126 79.4	3.1246 79.4	+0/-.0010 +0/-.025	1.88 .85
MI 52	MS 51962-36	3.250 82.6	+0/-.0006 +0/-.015	3.749 95.3	+0/-.0009 +0/-.023	2.010 51.1	.10 3	3.251 82.6	3.2496 82.6	+0/-.0010 +0/-.025	1.52 .69

Metric dimensions for reference only.

Not all parts are available from stock. Please contact customer service for availability (800) 626-2120.

For more information on bearing capabilities outside of our standard offering, please contact Application Engineering (800) 626-2093.

Machined Inner Rings **McGILL®**



MI Series (continued)

Part No.	Military No.	B		D1		W1	Ri	Recommended Shaft Diameter with Inner Ring			Inner Weight
		Bore Diameter		Outside Diameter		Width	Inner Ring Corner				
		inch mm		inch mm		inch mm		inch mm			lb kg
Inner Ring		Nom	Tol.	Nom	Tol.	Tol +0/-0.005 (+0/-0.13)	(Ref)	Rotating	Stationary	Tol.	
MI 54	MS 51962-38	3.375 85.8	+0/-0.0008 +0/-0.020	3.999 101.6	+0/-0.0009 +0/-0.023	2.010 51.1	.10 3	3.3758 85.8	3.3746 85.7	+0/-0.0010 +0/-0.025	2.04 .93
MI 56		3.500 88.9	+0/-0.0008 +0/-0.020	3.999 101.6	+0/-0.0009 +0/-0.023	2.010 51.1	.10 3	3.5008 89.0	3.4996 88.9	+0/-0.0010 +0/-0.025	1.63 .74
MI 56 8G				4.249 108.0	+0/-0.0009 +0/-0.023	2.010 51.1	.10 3	3.501 89.0	3.500 88.9	+0/-0.0010 +0/-0.025	1.67 .75
MI 58		3.625 92.1	+0/-0.0008 +0/-0.020	4.249 108.0	+0/-0.0009 +0/-0.023	2.010 51.1	.10 3	3.6258 92.1	3.6246 92.1	+0/-0.0010 +0/-0.025	1.70 .77
MI 60	MS 51962-40	3.750 95.3	+0/-0.0008 +0/-0.020	4.249 108.0	+0/-0.0009 +0/-0.023	2.010 51.1	.10 3	3.7508 95.3	3.7496 95.3	+0/-0.0010 +0/-0.025	1.75 .79
MI 62		3.875 98.5	+0/-0.0008 +0/-0.020	4.499 114.3	+0/-0.0009 +0/-0.023	2.260 57.4	.10 3	3.876 98.5	3.875 98.5	+0/-0.0010 +0/-0.025	3.25 1.47
MI 64		4.000 101.6	+0/-0.0008 +0/-0.020	4.999 127.0	+0/-0.0010 +0/-0.025	2.260 57.4	.10 3	4.001 101.7	4.000 101.6	+0/-0.0010 +0/-0.025	4.38 1.99
MI 68		4.250 108.0	+0/-0.0008 +0/-0.020	4.999 127.0	+0/-0.0010 +0/-0.025	2.260 57.4	.10 3	4.251 108.0	4.250 108.0	+0/-0.0010 +0/-0.025	5.24 2.37
MI 72 N	MS 51962-43	4.500 114.3	+0/-0.0008 +0/-0.020	5.499 139.7	+0/-0.0010 +0/-0.025	2.515 63.9	.10 3	4.501 114.4	4.500 114.3	+0/-0.0010 +0/-0.025	5.43 2.47
MI 72	MS 51962-44					3.015 76.6	.10 3	4.501 114.4	4.500 114.3	+0/-0.0010 +0/-0.025	5.97 2.71
MI 80 N	MS 51962-46	5.000 127.1	+0/-0.0010 +0/-0.025	5.998 152.4	+0/-0.0010 +0/-0.025	2.515 63.9	.12 3	5.001 127.1	5.000 127.0	+0/-0.0010 +0/-0.025	5.97 2.71
MI 80						2.010 51.1	.10 3	3.501 89.0	3.500 88.9	+0/-0.0010 +0/-0.025	7.12 3.23
MI 88 N	MS 51962-48	5.500 139.8	+0/-0.0010 +0/-0.025	6.498 165.1	+0/-0.0010 +0/-0.025	2.515 63.9	.12 3	5.501 139.8	5.500 139.7	+0/-0.0010 +0/-0.025	6.30 2.88
MI 88	MS 51962-49					3.015 76.6	.12 3	5.501 139.8	5.500 139.7	+0/-0.0010 +0/-0.025	7.56 3.54
MI 96	MS 51962-50	6.000 152.5	+0/-0.0010 +0/-0.025	7.248 184.2	+0/-0.0012 +0/-0.030	3.015 76.6	.12 3	6.001 152.5	6.000 152.4	+0/-0.0012 +0/-0.030	11.06 5.03
MI 104		6.500 165.2	+0/-0.0010 +0/-0.025	7.748 196.9	+0/-0.0012 +0/-0.030	3.015 76.6	.12 3	6.501 165.2	6.500 165.2	+0/-0.0012 +0/-0.030	11.90 5.39
MI 112		7.000 177.9	+0/-0.0010 +0/-0.025	8.248 209.6	+0/-0.0012 +0/-0.030	3.015 76.6	.12 3	7.001 177.9	7.000 177.9	+0/-0.0012 +0/-0.030	12.70 5.77
MI 120		7.500 190.6	+0/-0.0012 +0/-0.030	8.748 222.3	+0/-0.0012 +0/-0.030	3.015 76.6	.16 4	7.501 190.6	7.500 190.6	+0/-0.0012 +0/-0.030	13.60 6.17
MI 128		8.000 203.3	+0/-0.0012 +0/-0.030	9.248 235.0	+0/-0.0012 +0/-0.030	3.015 76.6	.16 4	8.001 203.3	8.000 203.3	+0/-0.0012 +0/-0.030	14.40 6.55