TIMKEN

Where You Turn

Super Precision Ball Screw Support Bearings

(MMN/MMF Series)

Timken® sealed ball screw support bearings improve machine tool accuracy, productivity and service life.

- *Reduced scrap through better precision*
- *Assembly width tolerance control stops endcap grinding*
- *Higher machine productivity*
- *Reduced maintenance*

MMN/MMF double-row series ball screw support bearings combine advanced features to meet machine tool demands for smooth and accurate positioning. Integral, low-torque contact seals effectively exclude contaminants for reliable operation and extended service life.

The super precision double-row configuration supports axial loads in both directions, as well as combination radial loads and over-turning moments. Innovative cage design permits additional balls for higher load capacity. ABEC 9/ISO P2 axial running tolerances reduce runout to deliver maximum accuracy for precise tool positioning and repeatability. This helps machine tools obtain truer and smoother cuts, while maximizing productivity.

Available in flanged (MMF) and non-flanged (MMN) series, these sealed unit designs simplify installation for both standard and rotating nut mountings. The MMF flanged version eliminates the need for external clamping of the outer ring. The standard version is the sealed duplex configuration, but both series may be ordered with seals or shields and either a duplex or quad set arrangement.

MMN/MMF Benefits

Increased service life – The pair of low-torque integral contact seals protects against contamination to extend bearing service life in harsh operating environments. Bearings are pre-packed with grease and allow for in-service relubrication.

High load capacity – Double-row design supports axial and combined loads. Greater ball complement increases load capacity.

Preload consistency for repeatable performance – The two-piece inner ring is matched with outer ring and cages for a precision preload that can be easily established against the shaft shoulder by a precision locknut.

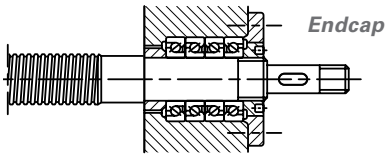
Super precision accuracy – ABEC 9/ISO P2 axial running tolerances reduce runout and enhance positioning accuracy. Tightly controlled width tolerances and smooth running torque help improve system consistency and performance.

Higher stiffness – Bearings incorporate a 60 degree contact angle and a maxi-mum complement of steel balls for superior axial rigidity and accuracy.

Higher speeds – Heavy-duty NLGI #2 grease provides outstanding speed performance. Ceramic balls and special greases are available to boost speed and acceleration levels, as well as stiffness.

Easy and flexible installation – One-piece bearing units with internal seals simplify mounting for both fixed and rotating nut designs. Flanged units eliminate external clamping.

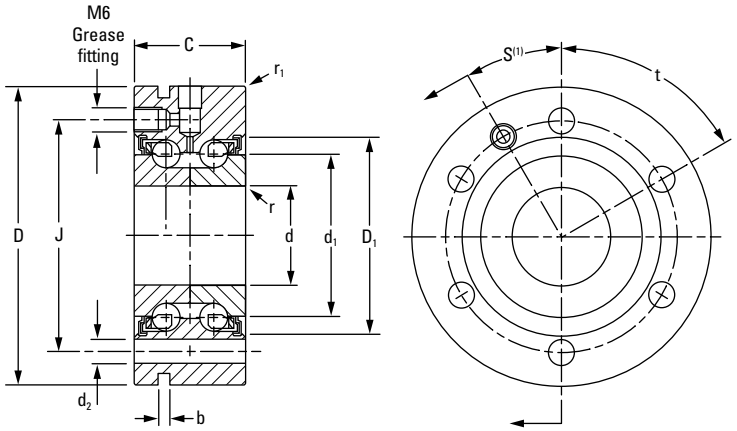
Stop endcap grinding (MMN) – Precision-ground width tolerance (five times tighter than ABEC 9/ISO P2 standards) and marking of individual set width virtually eliminate need to regrind endcaps for the proper fit. This improves productivity and helps reduce assembly costs.



Ball Screw Support Bearings Sealed, Double-Row Flanged Style

MMF Series

- Specifically designed for ball screw applications.
- Integral double-row design supports axial and combined loads.
- Nominal contact angle 60 degrees for superior axial rigidity and accuracy.
- Low torque, integral contact seals.
- Easy and flexible installation without external clamping.
- Sealed duplex configuration standard with optional seals, shields, ceramic balls and quadruplex sets available.



MMF Series Flanged

Bearing Number	d Bore	D O.D.	C Width	Wt.	Capacity C Dynamic	Capacity C_{0a} Static	Speed Rating	Radius r_1 Outer	Radius r Inner	D_1 Min.	d_1 Max.
METRIC	mm +0/ -(µm)			kg	mm		mm	mm	mm	mm	mm
MMF512BS55PP DM	12 (3.8)	55 (7.6)	25 (254)	0.40	15300	18000	4700	0.6	0.3	33.1	25.0
MMF515BS60PP DM	15 (3.8)	60 (7.6)	25 (254)	0.47	16100	20200	4290	0.6	0.3	37.0	27.6
MMF517BS62PP DM	17 (3.8)	62 (7.6)	25 (254)	0.49	16800	22200	4000	0.6	0.3	37.8	28.4
MMF520BS68PP DM	20 (5.1)	68 (7.6)	28 (254)	0.64	21800	30600	3400	0.6	0.3	43.2	34.5
MMF525BS75PP DM	25 (5.1)	75 (7.6)	28 (254)	0.76	23200	36200	2900	0.6	0.3	49.5	40.6
MMF530BS80PP DM	30 (5.1)	80 (7.6)	28 (254)	0.84	24500	41500	2600	0.6	0.3	54.3	45.6
MMF540BS100PP DM	40 (6.4)	100 (7.6)	34 (254)	1.50	36300	65800	2070	0.6	0.3	68.7	57.5
MMF550BS115PP DM	50 (6.4)	115 (7.6)	34 (254)	1.37	40500	85900	1670	0.6	0.3	82.6	71.5
MMF550BS140PP DM	50 (6.4)	140 (8.9)	54 (254)	4.89	95400	164300	1460	0.6	0.6	99.6	81.1
MMF560BS145PP DM	60 (7.6)	145 (8.9)	45 (254)	4.28	71200	139700	1400	0.6	0.6	100.0	89.0
INCH	in. +0/-(x)			lbs.	in.		in.	in.	in.	in.	in.
MMF512BS55PP DM	0.4724 (0.00015)	2.1654 (0.0003)	0.9843 (0.0100)	0.88	3450	4050	4700	0.024	0.012	1.304	0.905
MMF515BS60PP DM	0.5906 (0.00015)	2.3622 (0.0003)	0.9843 (0.0100)	1.04	3600	4550	4290	0.024	0.012	1.456	1.088
MMF517BS62PP DM	0.6693 (0.00015)	2.4409 (0.0003)	0.9843 (0.0100)	1.08	3775	5000	4000	0.024	0.012	1.49	1.117
MMF520BS68PP DM	0.7874 (0.0002)	2.6772 (0.0003)	1.1024 (0.0100)	1.42	4900	6875	3400	0.024	0.012	1.700	1.357
MMF525BS75PP DM	0.9843 (0.0002)	2.9528 (0.0003)	1.1024 (0.0100)	1.68	5200	8150	2900	0.024	0.012	1.943	1.599
MMF530BS80PP DM	1.1811 (0.0002)	3.1496 (0.0003)	1.1024 (0.0100)	1.86	5500	9350	2600	0.024	0.012	2.138	1.795
MMF540BS100PP DM	1.5748 (0.00025)	3.937 (0.0003)	1.3386 (0.0100)	3.41	8150	14800	2070	0.024	0.012	2.704	2.264
MMF550BS115PP DM	1.9685 (0.00025)	4.5276 (0.0003)	1.3386 (0.0100)	4.37	9100	19300	1670	0.024	0.012	3.25	2.815
MMF550BS140PP DM	1.9685 (0.00025)	5.5118 (0.00035)	2.126 (0.0100)	10.78	21500	36900	1460	0.024	0.024	3.919	3.192
MMF560BS145PP DM	2.3622 (0.0003)	5.7087 (0.00035)	1.7717 (0.0100)	9.43	16000	31400	1400	0.024	0.024	3.938	3.308

(1) Grease fitting spacing (S) is conditional to the quantity of bolt holes: 3 holes, S = 60°; 4 holes, S = 45°; 6 holes, S = 30°; 8 holes, S = 22.5°; 12 holes, S = 15°.

Suggested Shoulder Dia.		d_2 Bolt Dia.	Holes	b Groove Width	J Bolt Circle Diameter	t Hole Spacing	Stiffness		Inertia Moment	Preload
Housing	Shaft						Axial	Radial		
mm	**mm**	**mm**	Qty.	**mm**	**mm**	Degrees	**N/µm**	**N/µm**	**kg cm²**	**N**
32.0	**19.0**	**6.5**	3	**3**	**42**	120	**380**	**60**	**0.062**	**645**
34.5	**21.5**	**6.5**	3	**3**	**46**	120	**400**	**65**	**0.076**	**670**
36.5	**23.5**	**6.5**	3	**3**	**48**	120	**450**	**72**	**0.097**	**780**
42.5	**27.5**	**6.5**	4	**3**	**53**	90	**650**	**103**	**0.212**	**1780**
48.0	**33.5**	**6.5**	4	**3**	**58**	90	**750**	**118**	**0.415**	**2000**
53.5	**38.5**	**6.5**	6	**3**	**63**	60	**860**	**135**	**0.6**	**2335**
67.0	**49.0**	**8.5**	4	**3**	**80**	90	**1000**	**160**	**1.728**	**2780**
81.0	**63.0**	**8.5**	6	**3**	**94**	60	**1250**	**200**	**4.288**	**3335**
98.5	**66.0**	**10.5**	12	**3**	**113**	30	**1400**	**220**	**20.94**	**6784**
98.0	**72.0**	**8.5**	8	**3**	**120**	45	**1300**	**210**	**10.184**	**4225**

in.	in.	in.	Qty.	in.	in.	Degrees	10^6 lb/in.	10^6 lb/in.	lb in.²	lbs.
1.26	0.748	0.256	3	0.118	1.654	120	2.17132	0.34284	0.021186466	145
1.358	0.846	0.256	3	0.118	1.811	120	2.2856	0.37141	0.025970506	150
1.437	0.925	0.256	3	0.118	1.89	120	2.5713	0.411408	0.033146567	175
1.673	1.083	0.256	4	0.118	2.087	90	3.7141	0.588542	0.072444044	400
1.890	1.319	0.256	4	0.118	2.283	90	4.2855	0.674252	0.141812634	450
2.106	1.516	0.256	6	0.118	2.48	60	4.91404	0.77139	0.205030314	525
2.638	1.929	0.335	4	0.118	3.15	90	5.714	0.91424	0.590487304	625
3.189	2.408	0.335	6	0.118	3.701	60	7.1425	1.1428	1.465283311	750
3.878	2.598	0.413	12	0.118	4.449	30	7.9996	1.25708	7.155557959	1525
3.858	2.835	0.335	8	0.118	4.724	45	7.4282	1.19994	3.480047863	950

Ball Screw Support Bearings Sealed, Double-Row Cartridge Style

MMN Series

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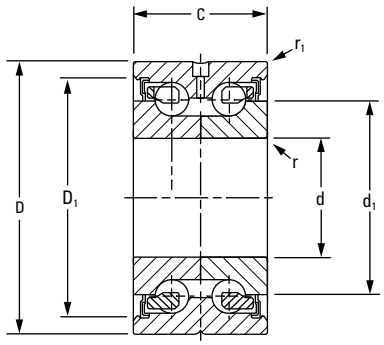
- Sealed duplex configuration standard with optional seals, shields, ceramic balls and quadruplex sets available.



MMN Series

Bearing Number	d Bore	D O.D.	C Width	Wt.	Capacity C Dynamic	Capacity C_{0a} Static	Speed Rating	Radius r_1 Outer	Radius r Inner	D_1 Max.	d_1 Min.	Suggested Shoulder Dia. Housing	Suggested Shoulder Dia. Shaft	Stiffness Axial	Stiffness Radial	Inertia Moment	Preload
METRIC	mm +0/ -(µm)			kg	N		RPM	mm		mm	mm	mm	mm	N/µm	N/µm	kg cm²	N
MMN512BS42PP DM	12 (3.8)	42 (6.4)	25 (254)	0.20	15300	18000	4700	0.6	0.3	25.0	33.1	32.0	19.0	380	60	0.062	645
MMN515BS45PP DM	15 (3.8)	45 (6.4)	25 (254)	0.23	16100	20200	4290	0.6	0.3	27.6	37.0	34.5	21.5	400	65	0.076	670
MMN517BS47PP DM	17 (3.8)	47 (6.4)	25 (254)	0.24	16800	22200	4000	0.6	0.3	28.4	37.8	36.5	23.5	450	72	0.097	780
MMN520BS52PP DM	20 (5.1)	52 (7.6)	28 (254)	0.32	21800	30600	3400	0.6	0.3	34.5	43.2	42.5	27.5	650	103	0.212	1780
MMN525BS57PP DM	25 (5.1)	57 (7.6)	28 (254)	0.35	23200	36200	2900	0.6	0.3	40.6	49.3	48.0	33.5	750	118	0.415	2000
MMN530BS62PP DM	30 (5.1)	62 (7.6)	28 (254)	0.40	24500	41500	2600	0.6	0.3	45.6	54.3	53.5	38.5	860	135	0.6	2335
MMN540BS75PPDM	40 (6.4)	75 (7.6)	34 (254)	0.64	36300	65800	2070	0.6	0.3	57.5	68.7	67.0	49.0	1000	160	1.728	2780
MMN550BS90PP DM	50 (6.4)	90 (7.6)	34 (254)	0.91	40500	85900	1670	0.6	0.3	71.5	82.6	81.0	63.0	1250	200	4.288	3335
MMN550BS110PP DM	50 (6.4)	110 (8.9)	54 (254)	2.42	95400	164300	1460	0.6	0.6	81.1	99.6	98.5	66.0	1400	220	20.94	6784
MMN560BS110PP DM	60 (7.6)	110 (8.9)	45 (254)	1.82	71200	139700	1400	0.6	0.6	84.0	100.0	98.0	72.0	1300	210	10.184	4225

INCH	in. +0/-(x)			lbs.	lbs.		RPM	in.	in.	in.	in.	in.	in.	10^6 lb/in.	10^6 lb/in.	lb in.²	lbs.
MMN512BS42PP DM	0.4724 (0.00015)	1.6535 (0.00025)	0.9843 (0.0100)	0.44	3450	4050	4700	0.024	0.012	1.304	0.985	1.259	0.748	2.17132	0.34284	0.021186466	145
MMN515BS45PP DM	0.5906 (0.00015)	1.7717 (0.00025)	0.9843 (0.0100)	0.5	3600	4550	4290	0.024	0.012	1.456	1.088	1.358	0.846	2.2856	0.37141	0.025970506	150
MMN517BS47PP DM	0.6693 (0.00015)	1.8504 (0.00025)	0.9843 (0.0100)	0.54	3775	5000	4000	0.024	0.012	1.49	1.117	1.437	0.925	2.5713	0.411408	0.033146567	175
MMN520BS52PP DM	0.7874 (0.0002)	2.0472 (0.0003)	1.1024 (0.0100)	0.70	4900	6875	3400	0.024	0.012	1.700	1.357	1.673	1.083	3.7141	0.588542	0.072444044	400
MMN525BS57PP DM	0.9843 (0.0002)	2.2441 (0.0003)	1.1024 (0.0100)	0.78	5200	8150	2900	0.024	0.012	1.943	1.599	1.890	1.319	4.2855	0.674252	0.141812634	450
MMN530BS62PP DM	1.1811 (0.0002)	2.4409 (0.0003)	1.1024 (0.0100)	0.88	5500	9350	2600	0.024	0.012	2.138	1.795	2.106	1.516	4.91404	0.77139	0.205030314	525
MMN540BS75PPDM	1.5748 (0.00025)	2.9528 (0.0003)	1.3386 (0.0100)	1.42	8150	14800	2070	0.024	0.012	2.704	2.264	2.638	1.929	5.714	0.91424	0.590487304	625
MMN550BS90PP DM	1.9685 (0.00025)	3.5433 (0.0003)	1.3386 (0.0100)	2.02	9100	19300	1670	0.024	0.012	3.250	2.815	3.189	2.408	7.1425	1.1428	1.465283311	750
MMN550BS110PP DM	1.9685 (0.00025)	4.3307 (0.00035)	2.126 (0.0100)	5.34	21500	36900	1460	0.024	0.024	3.919	3.192	3.878	2.598	7.9996	1.25708	7.155557959	1525
MMN560BS110PP DM	2.3622 (0.0003)	4.3307 (0.00035)	1.7717 (0.0100)	4.02	16000	31400	1400	0.024	0.024	3.938	3.308	3.858	2.835	7.4282	1.19994	3.480047863	950

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