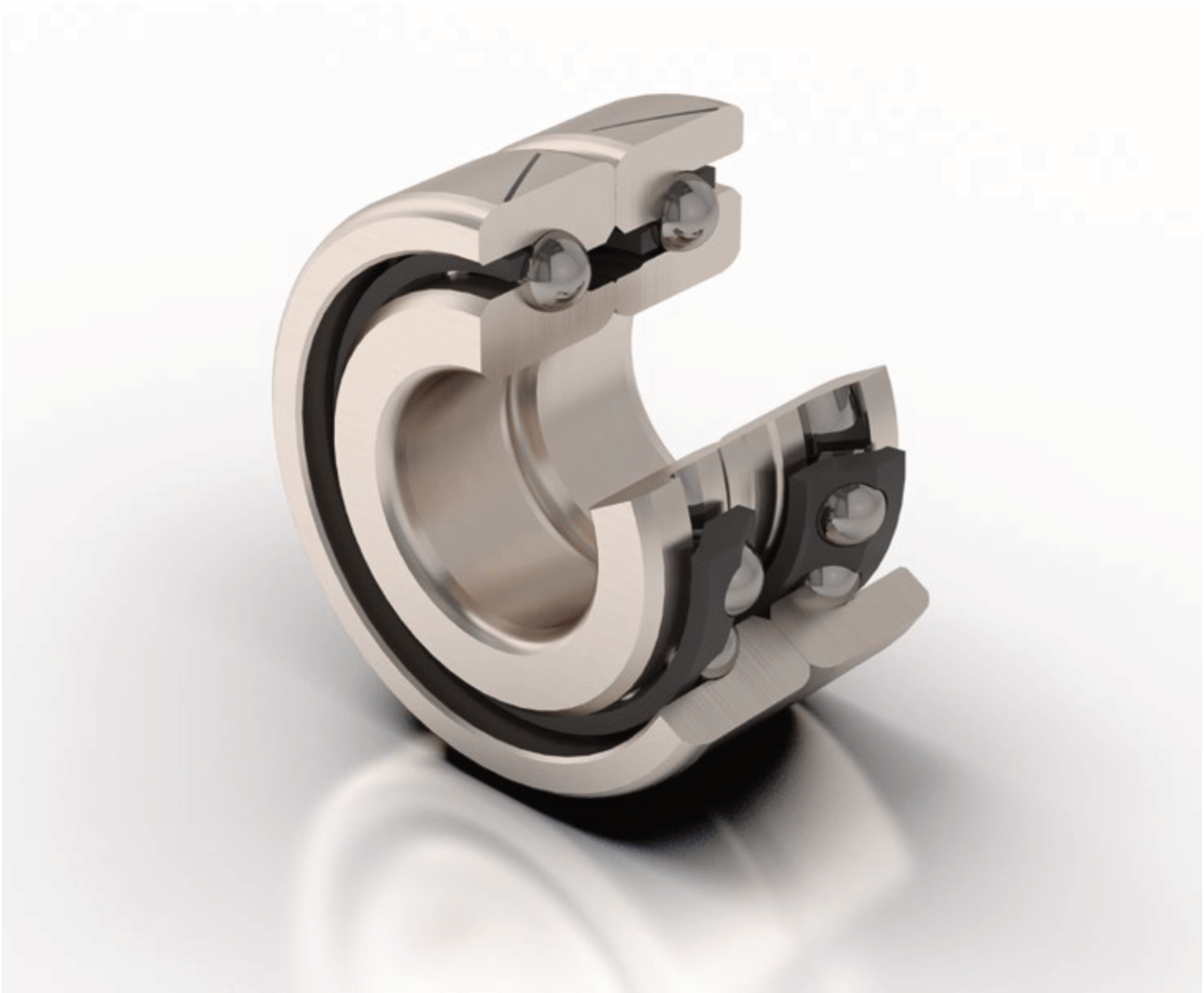
Ball Screw Support Bearings

Design & Applications

Barden Series ball screw support bearings are manufactured specifically for high performance ball screw applications, where high rigidity requirements preclude the use of standard angular contact bearings. The internal configuration has been designed to provide an optimum combination of high rigidity, low drag torque, exceptional control of axial runout, higher running speeds and longer life.

Series L non-separable angular contact bearings have cutaway shoulders on both the inner and outer rings. They can support very high thrust loads in one direction or combinations of radial and thrust loads, but not radial loading alone.

They are intended for special applications in machine tools, e.g., ball screw supports, cross slides, X-Y table positioners and transfer tables. They should not be used in place of standard angular contact spindle bearings. These bearings are available as single bearings or as standard duplex or quadruplex sets. In addition, we will supply custom combination sets to meet specialised application needs.



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Limiting Speeds

Limiting speeds shown in the data table are useful guidelines. Actual speed limits must be based on the application characteristics. Life requirements, heat transfer conditions, loading and lubrication methods are typical influential factors on the attainable speed.

Preloads

Standard values shown will be supplied unless otherwise specified. Barden recognises that some applications do not require the full axial stiffness (compliance) of the standard preload and will supply bearings with custom-ground preloads if required.

Seals

Ball screw support bearings can also be supplied with closures such as seals or shields, please discuss your requirements with your Barden sales engineer for details.

Cages

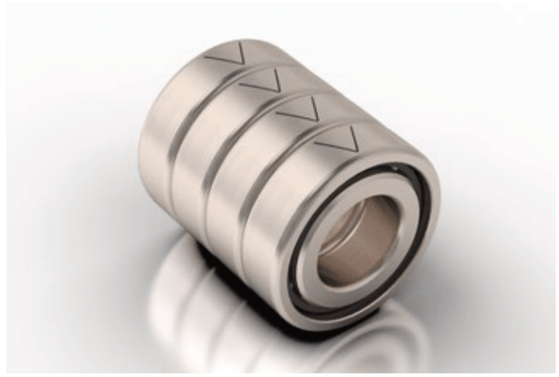
Y990 suffixed bearings have a moulded, glass fibre reinforced polyamide cage with spherical ball pockets. All metric ball screw support bearings come with the moulded polyamide cage, standard. Bearings with suffix Y991 feature a precision machined, land-piloted cage produced from reinforced phenolic material.

Mounting and Fitting

Normal fitting practice is line-to-line to loose for both shaft and housing fits, as shown in table. All bearing pairs and sets are match-marked on their outside diameter surfaces to indicate correct positioning of each bearing. Recommendations for shaft and housing shoulder diameters are based on maximum support of duplex-mounted bearings (see table). In circumstances with other mounting arrangements, consult Barden Product Engineering.

Life Calculations

Most ball screw support bearing applications are subject to duty-cycle loading with constantly changing feeds, speeds, and operating loads. These factors, in combination with the high preloads built into the bearings, make life calculations difficult. Consult Barden Product Engineering for information which can be used in specific cases.



Materials

All ball screw support bearings (rings and balls) are made from carbon chrome steel. Bearings are also available with rings produced from alternate materials such as corrosion resistant steel and balls from ceramic (Si_3N_4) for extreme environments.

Configurations

Standard configuration includes a cage; some sizes are also available in a full complement version (X205 suffix). Please consult Barden Engineering team.

Attainable Speeds

Limits given are for duplex pairs mounted with standard preload mounted sets with standard preload.

Duplexing

All bearings are supplied universally ground and can be mounted in pairs, DF (Face-to-Face), DB (Back-to-Back) or combinations of three, four or more bearings as required. Standard preloads for pairs are shown.

Tolerances

Standard precision class for Series L are ABEC 7, except for a tighter maximum raceway runout with side 2.5µm (0.0001").

Lubricant:

Desired lubrication should be specified when ordering, based on torque, speed and temperature conditions of the application. Consult Barden for details.

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Basic Reference	Dimensions				*Limiting Speed		Preload Force	Abutment Diameters		**Axial Rigidity	***Drag Torque	Dynamic Thrust Capacity	Static Thrust Capacity
	Bore Diameter	Outside Diameter	Standard Width	Maximum Corner To Clear Shaft/ Housing			Standard	Min Shaft/Max Housing					
	d [mm]	D [mm]	B [mm]	r [mm]	Oil [min^{-1}]	Grease [min^{-1}]	F_{va} [N]	Shaft [mm]	Housing [mm]	c_a [N/µm]	[Nm]	C [kN]	C_o [kN]
L2015JY990	15	35	11	0.6	12000	9000	1810	20.1	30.9	540	0.042	9.9	17.9
L2017JY990	17	40	12	0.6	10000	8000	2530	22.6	35.3	670	0.067	13.8	26.4
L2020JY990	20	47	14	1.0	9000	7000	3100	26.5	40.5	805	0.086	16.9	35.3
L2025JY990	25	52	15	1.0	8000	6000	3570	31.1	45.9	900	0.105	19.5	43.3
L2030JY990	30	62	16	1.0	7000	5000	4190	37.9	54.2	1050	0.128	22.9	55.8
L2035JY990	35	72	17	1.1	6000	4000	4870	44.6	62.4	1205	0.154	26.7	70.2
L2040JY990	40	80	18	1.1	5000	4000	6030	51.3	71.3	1380	0.209	33.0	91.3
L2045JY990	45	85	19	1.1	5000	3000	6130	55.0	75.0	1430	0.212	33.6	96.1
L2050JY990	50	90	20	1.1	4000	3000	6270	63.6	83.6	1530	0.214	34.4	106.1
L2060JY990	60	110	22	1.1	3000	3000	9020	73.6	98.9	1880	0.362	49.4	158.7
L2047JY990	20	47	15	1.0	9000	7000	2270	26.5	40.5	745	0.056	17.2	36.3
L2562JY990	25	62	15	1.0	7000	5000	3080	37.2	54.2	970	0.084	23.3	57.3
L3062JY990	30	62	15	1.0	7000	5000	3080	37.9	54.2	970	0.084	23.3	57.3
L3572JY990	35	72	15	1.1	6000	4000	3570	44.6	62.4	1115	0.101	27.1	72.1
L4072JY990	40	72	15	1.1	5000	4000	3350	47.9	64.2	1140	0.088	25.4	71.4
L4090JY990	40	90	20	1.5	5000	3000	5910	53.2	78.5	1400	0.219	44.8	120.8
L4575JY990	45	75	15	1.1	5000	4000	3390	52.0	68.0	1180	0.089	25.6	75.1
L45100JY990	45	100	20	1.5	4000	3000	6980	60.5	88.5	1575	0.277	52.9	149.9
L50100JY990	50	100	20	1.5	4000	3000	6980	61.5	88.5	1575	0.277	52.9	149.9
L55120JY990	55	120	20	1.5	3000	2000	7310	74.5	104.6	1750	0.284	55.4	175.3
L60120JY990	60	120	20	1.5	3000	2000	7310	75.5	104.6	1750	0.284	55.4	175.3

* Limiting speeds are provided as a guide only with the attainable speed depending on many factors specific to individual installations.
** For a pair of bearings under standard preload.
*** For a single bearing, lightly oiled, under preload only.