



SLEEVE BEARING GUIDE

How to select, specify, and apply Thomson™ Nyliner™ Engineered Polymer bearings.

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Since 1954, Thomson™ Nyliner™ has been manufacturing high-quality bearings, custom molding and industrial solutions. Our product can be found in many diverse markets, from the simple to the most extreme environments. In addition to our standard part catalog, our engineers and specialists can help design, develop and supply custom molded solutions made just for your application.

Since the beginning, our unmatched expertise in polymer wear, friction, and molding value-added solutions has enabled our customers to enjoy benefits in the following areas: Cost Reduction, Part Consolidation, Noise Isolation, Vibration Dampening, Reduced Friction, Assembly Consolidation, Weight Reduction, and Corrosion Resistance. When product assembly must be fast and simple, Thomson Nyliner bearings are the industry's first choice.

Our total capability is based on more than 50 years of design experience in partnership with thousands of customers. Thomson Nyliner products are designed and manufactured in a 180,000 square-foot facility called Specialty Product Technologies in Elizabethtown, NC. Specialty Product Technologies (SPT) is part of Fortive Corporation, a Fortune 500 Company. Our facility employs the Fortive Business System (FBS) to drive continuous improvement.

Better performance by design.

A unique combination of design features assures outstanding bearing performance.

Advanced thin wall construction

State-of-the-art injection molding technology allows Thomson Nyliner to maintain the critical dimensional tolerance necessary for precision fits. This thin wall construction is especially effective in the prevention of heat build-up. Because thin wall bearings assure efficient heat transfer, the potential for bearing failure is greatly reduced.

Unique compensation gap

A standard feature of every Thomson Nyliner bearing is the built-in axial slot that allows the bearing diameter to adjust automatically due to variations in temperature or humidity.

Thomson Nyliner Engineering Polymers (TEP)

Our bearings are precision molded from Thomson Nyliner Engineering Polymers (TEP), which are exclusive blends of bearing quality thermoplastics and unique additives. They are tough, resilient, water-resistant plastics with low coefficients of friction that require little or no lubrication. These plastics are virtually unaffected by alkaline and dilute acids, detergents, alcohol or organic solvents. They keep performing in hostile environments that can destroy ordinary plastics or corrode metal.

What We Offer

Our customers select Thomson™ Nyliners™ to achieve application-specific load, speed, friction and temperature requirements. These sleeve bearings also deliver these specific benefits:

Cost Reduction

Ideal drop-in alternative to sintered bronze or other metal bearings at a lower initial cost, longer life, and reduction in maintenance.

Part Consolidation

Properly selected sleeve bearings from this guide, can replace multiple existing part numbers.

Noise Isolation

Thomson Nyliner Engineered Polymers (TEP) are built to withstand high loads and high temperatures, reducing instances of metal to metal contact.

Vibration Dampening

Forces on multiple axes are absorbed through the bearing material.

Reduced Friction

Thomson Nyliner Engineered Polymers (TEP) bearings reduce wear and friction in the most challenging operating conditions.

Assembly Consolidation

Our signature compensation gap allows the bearing diameter for easy installation and adjusts to variations in temperature or humidity.

Weight Reduction

All these characteristics and their benefits are accomplished in a significantly lighter part weight than comparable metal bearings.

Corrosion Resistance

Our Thomson Nyliner Engineered Polymers enable us to achieve application-specific load, speed, friction and temperature requirements.

Thomson Nyliner Engineered Polymers (TEP)

Bearings made from Thomson Nyliner Engineered Polymers (TEP) offer a greatly expanded performance range over Thomson Nyliner's standard bearings which are molded from TEP 110. Thomson Nyliner Engineered Polymers are available off the shelf for all types and sizes of bearings in our sleeve bearing catalog.

Greatly Increased PV Ratings

Thomson Nyliner Engineered Polymers offer PV ratings previously only available in more expensive and difficult to use bearings. This material gives PV ratings in the range of 10,000 to 40,000.

Higher Operating Temperatures

All Thomson Nyliner Engineered Polymers offer elevated temperature capabilities. Some of these materials withstand temperatures over 400°F. This means higher ambient temperature possibilities and greater resistance to heat caused by running friction.

Lower Friction

With the addition of sophisticated internal lubricants, Thomson Nyliner Engineered Polymers offer coefficients of friction as low as .06, even when bearings are operated without additional lubrication.

Greatly Increased Bearing Life

Utilizing a combination of high performance resins and sophisticated internal reinforcement systems, bearings made with Thomson Nyliner Engineered Polymers offer extremely long operating life.

Bearings made of Thomson Nyliner Engineered Polymers often replace other types of plain bearings. In many cases, cost is not the only advantage. For instance, sintered bronze bushings have always presented the bearing user with several serious disadvantages: they have an unpredictable supply of lubrication, they are subject to corrosion and environmental attack, they require press fitting (which may change during the life of the product), and they often require secondary operations to achieve final dimensional tolerances. Compare the performance characteristics and design advantages with other types of plain bearings. In many cases, Thomson Nyliner Engineered Polymers are the best all-around solution to solving bearing design challenges. Use Thomson Nyliner Engineered Polymer Bearings in applications that require high performance, easy installation, long life, and moderate cost.

Chemical Resistance At 77° F

Shows the effect of various chemicals on selected Thomson bearing grade engineering polymers

- 1. Inert
- 2. Little or no effect
- 3. Mild effect
- 4. Softening or swelling
- 5. Severe degradation of properties

	TEP110	TEP179+	TEP211+	TEP642L+	TEP835+
Aromatic Solvents	1	1	2	1	5
Aliphatic Solvents	1	1	1	1	1
Chlorinated Solvents	1	3	2	1	5
Weak bases and salts	3	2	2	2	2
Strong Bases	2	5	5	2	5
Strong Acids	5	5	5	5	2
Strong Oxidants	5	2	5	5	1
Esters & Ketones	1	1	1	1	5

“+” symbol equals Thomson Nyliner Engineered Polymer Plus material.

Property & Test Performance Data

	UNITS	TEP110	TEP179+	TEP211+	TEP642L+	TEP835+
Tensile Strength - ISO 527	MPa	82	95	74	79	78
Young's Modulus - ISO 527	MPa	3100	3600	3400	3500	3820
Flexural Modulus - ISO 178	MPa	2800	3240	3200	3500	3560
Izod Impact (Notched) - ISO 180	kJ/m ²	5.5	4.7	8	5.8	4
Coefficient of Friction Static	N/A	0.31	0.2	0.27	0.46	0.34
Dynamic	N/A	0.43	0.2	0.3	0.55	0.38
Water Absorption - ISO 62	N/A	8.50%	8.50%	0.90%	1.17%	0.93%
Heat Deflection Temp. - 1.8MPa ISO 75	C	70	85	107	135	112
Coefficient of Linear Thermal Expansion	um/mC	100	90	100	72	63*
Limiting PV	Mpa m/min	6	4.83	15	25.1	27**
Wear Factor	10 ⁻⁸ mm ³ /Nm	7.2	181	12	26.2	38.2

“+” symbol equals Thomson Nyliner Engineered Polymer Plus material.

What to Consider When Designing a Bearing

To select the right Thomson™ Nyliner™ bearing for your application, several important design factors must be considered. These are bearing load, shaft speed, operating clearance, shaft material and finish, duty cycle, environment and housing material.

Bearing Load

Expressed as pressure (P), is measured in pounds per square inch (PSI). Square inch area is determined by multiplying the bearing's inside diameter by the bearing length.

$$\text{Load} / \text{Projected Area} = \text{Pressure (P)}$$

Shaft Surface Speed

Or velocity (V), is expressed in feet per minute (FPM).

$$V = \text{Shaft rpm} \times \text{shaft diameter in inches} \times .262$$

PV Value (PV)

The combined effect of pressure (P) multiplied by velocity (V). PV defines the maximum combination of pressure and speed that a bearing material is capable of withstanding. Operating a bearing more than its PV may result in premature failure. Lubrication will significantly increase the PV rating of a bearing.

$$PV = \text{Pressure (P)} \times \text{surface velocity (V)}$$

PV Rating is affected by:

Clearance

The single most important factor governing a bearing's PV performance is the bearing to shaft running clearance. Recommended clearances for all Thomson Nyliner bearings are given by bearing type.

Shaft Hardness & Material

The high surface toughness of Nyliner bearings demand high quality shafting. For long service life and optimum bearing performance, the use of carbon steel, case hardened to Rockwell C60, with a surface finish of 16 micro inches Ra, is recommended. Non-ferrous shaft materials, such as aluminum or brass are not recommended for use with the Nyliner bearings but may be sufficient in certain applications.

Design Considerations

Lubrication

Although Thomson™ Nyliner™ bearings may be operated dry, a few drops of oil added during the breaking-in period can significantly increase operating life. This initial lubrication creates a highly polished bearing surface, which maximizes the low friction characteristics of our bearing.

Operating Cycles

Bearing PV ratings have been established during continuous operation. In applications which require only intermittent machine operation, it is possible to exceed PV ratings. Housing material. Housing materials for Thomson Nyliner bearings should possess good heat transfer characteristics to minimize potential bearing overheating.

Load Ratings

For dry operation, a film of lubricant should be present on the bearing surface during the initial break-in period. If for any reason the lubricant is removed, it should be replaced prior to putting the bearing in service. Bearings lubricated with liquids other than oil will operate satisfactorily at load ratings from 50% to 75% of the oil lubricated ratings. Static-load capabilities are based on the compressive strength of the proprietary Thomson Nyliner Engineering Polymers and indicate the resistance of these materials to continuous heavy-duty, non-rotating loads or to impact loads without permanent deformation. Load ratings are based on continuous operation. For intermittent service, load ratings may be increased up to 100%.

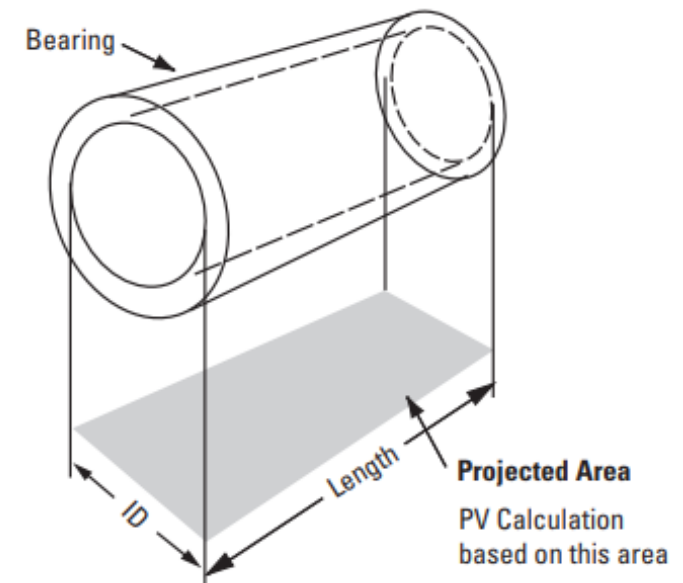
Calculating PV

The PV value is a performance measurement that is the product of pressure (psi) and velocity, (surface feet per minute)

$$PV = \text{Pressure} \times \text{Surface Velocity}$$

$$PV = \text{Radial Load (pounds)} / \text{Projected Area (in}^2\text{)}$$

$$PV = \text{Radial Load (pounds)} / \text{Projected Area (in}^2\text{)} \times \text{Revolutions Per Minute} \times \text{Inside Diameter of Bearing (in)} \times .262$$



How to Install Thomson™ Nyliner™ Bearings

Thomson™ Nyliner™ bearings should be installed in a housing bore that provides good support for the bearing.

Shaft Selection

For normal applications, steel shafts with a minimum hardness of Rockwell C60 are recommended. Shaft finishes should be 16 microinches Ra. When Thomson Nyliner bearings are operated continuously, without lubrication at elevated speeds, shafts should be hardened or plated to minimize shaft wear. Thomson 60 Case™ hardened and ground steel shafts are ideal for these critical applications. Unhardened stainless steel shafting is not recommended. Where corrosion is a problem, hardened stainless steel shafts (Thomson 60 Case shafts), chrome-plated, or nickel-plated shafts are recommended.

Establishing Correct Clearances

It is essential that adequate operating clearance be maintained between the shaft and the working surface of the bearing. This helps promote even distribution of lubricants and reduces the mechanism's chances of seizure. Diameters of housing bores should not be smaller than the diameters specified in this catalog unless shaft diameters are reduced accordingly. To check bearing I.D.s for clearance, the bearing should be installed in its housing bore. Plug gages with diameters corresponding to the minimum and maximum recommended I.D.s can then be used to establish whether or not clearance will be correct when the bearing is operated on a shaft. In applications where bearings operate in water, alcohol or chemical solutions, the absorption of liquid may cause the wall thickness of the bearing to increase. Bearing wall thickness may also increase in humid environments. In such cases, the initial clearance should be increased .001" by either reducing the maximum shaft diameter or increasing the housing bore diameter.

Initial Break-In

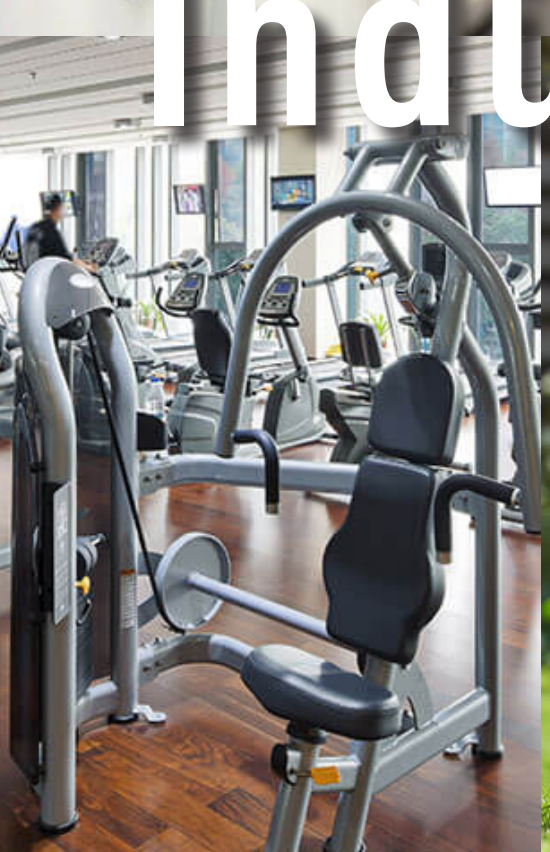
If Thomson Nyliner bearings are to run without lubrication in service, performance will be improved if a few drops of oil are added to the surface and broken in on the shaft for a few hours.

Lubrication

In many applications, our bearings can be run without lubrication, as long as recommended loads and speeds for non-lubricated operation are not exceeded. If loads and speeds are high enough to generate damaging heat, lubrication is mandatory. A good motor oil is the best lubricant. When lubricants other than oil are used, load ratings for lubricated operations should be reduced 25% to 50%.



Industries Served





**Straight Sleeve Bearing
Standard**



**Straight Sleeve Bearing
With Lubrication Groove**



**Straight Sleeve Bearing
With Carbon Steel Outer Sleeve**



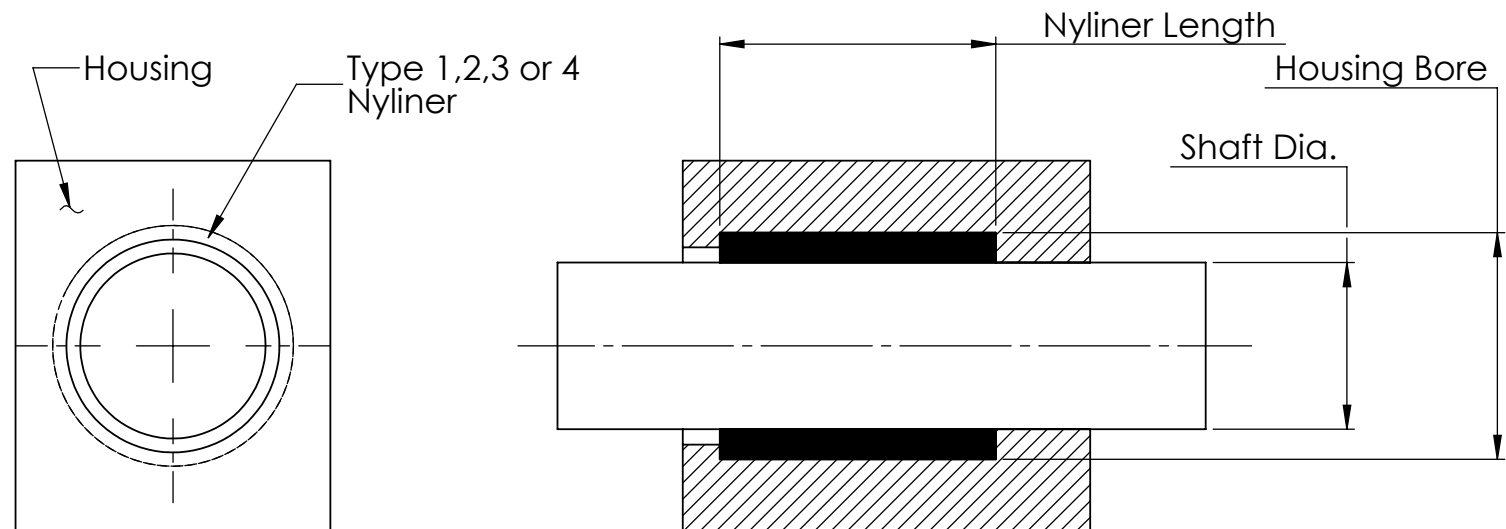
**Straight Sleeve Bearing
With Lubrication Groove & Carbon Steel Outer Sleeve**

Straight Sleeve Bearings

Thomson™ Nyliner™ Straight Sleeve Bearings provide high radial and static load capacity in limited spaces. This type of bearing was designed especially for applications where press fitting into a housing bore is the most practical bearing retention method. All of our straight sleeve bearings feature an axial compensation gap, which will absorb most of the fluctuation of plastic sleeve bearings. The compensation gap allows the bearing to expand and contract in reaction to environmental factors, such as humidity or temperature. Bearings will expand slightly due to frictional heat and moisture absorption. The majority of this expansion is accommodated by the compensation gap. Changes in wall thickness are minimal due to the thin wall construction of Thomson™ Nyliner™ bearings.

Straight sleeve bearings are available as simple plastic sleeves with the option for a lubrication groove and/or a carbon steel outer sleeve. The lubrication groove allows for easy lubrication to the central part of the sleeve bearing. The addition of an outer sleeve provides extra support to the bearing for mildly corrosive environments. Standard straight sleeve bearings and straight sleeve bearings with lubrication grooves require some external means of retaining the bearing in the housing bore.

The minimum diametral shaft to bearing clearances normally recommended is .001" (0.03mm) for bearing I.D. sizes to 1.000" (25.4mm); .0015" (0.04mm) for I.D. sizes from 1.000" (25.4mm) to 1.250" (31.75mm); and .002" (0.05mm) for I.D. sizes over 1.250" (31.75mm). These clearances are recommended to allow proper running clearance for trouble-free operation. These recommended running clearances can be reduced if Thomson Nyliner Engineering Polymers are used. TEP materials have significantly lower coefficients of linear thermal expansion than standard bearings.



Standard Straight Sleeve Bearings - Inches (Millimeters)

Part Number	Nominal Bearing Inner Diameter	Bearing Inner Diameter			Housing Bore	Bearing Length (+0, -1/64)	Minimum Distance Between Retaining Shoulders	Retaining Lips Inner Diameter (±.005)
		Inner Diameter	Tolerance (-.000)	Maximum Shaft Diameter				
3L4-D	.188 (4.76)	.189 (4.79)	+0.001 (0.03)	.188 (4.76)	.234 (5.94)	.205 (5.21)	.210 (5.33)	.205 (5.21)
4L6-D	.250 (6.35)	.251 (6.38)	+0.001 (0.03)	.250 (6.35)	.294 (7.47)	.315 (8.00)	.327 (8.31)	.268 (6.81)
5L7-D	.313 (7.94)	.314 (7.96)	+0.001 (0.03)	.3125 (7.94)	.381 (9.67)	.370 (9.39)	.385 (9.78)	.335 (8.51)
5L9-D	.313 (7.94)	.314 (7.96)	+0.001 (0.03)	.3125 (7.94)	.381 (9.67)	.540 (13.72)	.550 (13.97)	.335 (8.51)
6L8-D	.375 (9.53)	.376 (9.55)	+0.001 (0.03)	.375 (9.53)	.444 (11.26)	.432 (10.97)	.448 (11.38)	.395 (10.03)
8L8-D	.500 (12.70)	.501 (12.73)	+0.001 (0.03)	.050 (12.70)	.569 (14.44)	.432 (10.97)	.448 (11.38)	.520 (13.21)
8L12-D	.500 (12.70)	.501 (12.73)	+0.001 (0.03)	.050 (12.70)	.569 (14.44)	.750 (19.05)	.770 (19.56)	.520 (13.21)
10L12-D	.625 (15.88)	.626 (15.82)	+0.001 (0.03)	.625 (15.88)	.694 (17.61)	.670 (17.02)	.700 (17.78)	.645 (16.38)
10L16-D	.625 (15.88)	.626 (15.82)	+0.001 (0.03)	.625 (15.88)	.694 (17.61)	1.00 (25.40)	1.030 (26.16)	.645 (16.38)
12L5-D	.750 (19.05)	.751 (19.08)	+0.001 (0.03)	.750 (19.05)	.818 (20.78)	.330 (8.38)	.340 (8.64)	.770 (19.56)
12L12-D	.750 (19.05)	.751 (19.08)	+0.001 (0.03)	.750 (19.05)	.818 (20.78)	.670 (17.02)	.700 (17.78)	.770 (19.56)
14L12-D	.875 (22.23)	.876 (22.25)	+0.001 (0.03)	.875 (22.23)	.939 (23.84)	.670 (17.02)	.700 (17.78)	.893 (22.68)
16L18-D	1.000 (25.40)	1.001 (25.43)	+0.001 (0.03)	1.000 (25.4)	1.094 (27.77)	1.125 (28.58)	1.156 (29.36)	1.020 (25.91)
18L18-D	1.125 (28.58)	1.126 (28.60)	+0.001 (0.03)	1.125 (28.58)	1.219 (30.95)	1.125 (28.58)	1.156 (29.36)	1.145 (29.08)
20L18-D	1.250 (31.75)	1.251 (31.78)	+0.001 (0.03)	1.250 (31.75)	1.344 (34.12)	1.125 (28.58)	1.156 (29.36)	1.270 (32.26)
24L24-D	1.500 (38.10)	1.502 (38.15)	+0.002 (0.05)	1.500 (38.10)	1.625 (41.26)	1.500 (38.1)	1.550 (39.37)	1.540 (39.12)
32L39-D	2.000 (50.80)	2.002 (50.85)	+0.003 (0.08)	2.000 (50.80)	2.125 (53.98)	2.437 (61.89)	2.470 (62.74)	2.040 (51.82)
48L28-D	3.000 (76.20)	3.002 (76.25)	+0.004 (0.10)	3.000 (76.20)	3.125 (79.38)	1.750 (44.45)	1.770 (44.96)	3.040 (77.22)

Straight Sleeve Bearings with Lubrication Groove - Inches (Millimeters)

Part Number	Nominal Bearing Inner Diameter	Bearing Inner Diameter			Housing Bore	Bearing Length (+0, -1/64)	Minimum Distance Between Retaining Shoulders	Retaining Lips Inner Diameter (±.005)
		Inner Diameter	Tolerance (-.000)	Maximum Shaft Diameter				
4L6	.250 (6.35)	.251 (6.38)	+0.001 (0.03)	.250 (6.35)	.294 (7.47)	.315 (8.00)	.327 (8.31)	.268 (6.81)
5L7	.313 (7.94)	.314 (7.96)	+0.001 (0.03)	.313 (7.94)	.381 (9.67)	.370 (9.39)	.385 (9.78)	.335 (8.51)
6L8	.375 (9.53)	.376 (9.55)	+0.001 (0.03)	.375 (9.53)	.444 (11.26)	.432 (10.97)	.448 (11.38)	.395 (10.03)
9L8	.563 (14.29)	.564 (14.31)	+0.001 (0.03)	.5625 (14.29)	.631 (16.03)	.484 (12.29)	.500 (12.70)	.585 (14.86)
10L12	.625 (15.88)	.626 (15.82)	+0.001 (0.03)	.625 (15.88)	.694 (17.61)	.670 (17.02)	.700 (17.78)	.645 (16.38)
12L12	.750 (19.05)	.751 (19.08)	+0.001 (0.03)	.750 (19.05)	.818 (20.78)	.670 (17.02)	.700 (17.78)	.770 (19.56)
14L12	.875 (22.23)	.876 (22.25)	+0.001 (0.03)	.875 (22.23)	.939 (23.84)	.670 (17.02)	.700 (17.78)	.893 (22.68)
16L16	1.000 (25.40)	1.001 (25.43)	+0.001 (0.03)	1.000 (25.4)	1.059 (26.89)	.910 (23.11)	.940 (23.88)	1.02 (25.91)
18L16	1.125 (28.58)	1.126 (28.60)	+0.001 (0.03)	1.125 (28.58)	1.185 (30.09)	.910 (23.11)	.940 (23.88)	1.145 (29.08)
20L16	1.250 (31.75)	1.251 (31.78)	+0.001 (0.03)	1.25 (31.75)	1.311 (33.29)	.910 (23.11)	.940 (23.88)	1.270 (32.26)
24L20	1.500 (38.10)	1.502 (38.15)	+0.002 (0.05)	1.50 (38.10)	1.586 (40.28)	1.148 (29.16)	1.190 (30.23)	1.535 (38.99)

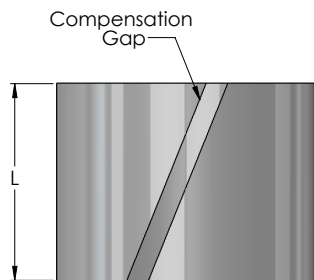
Straight Sleeve Bearings with Carbon Steel Outer Sleeve - Inches (Millimeters)

Part Number	Bearing Inner Diameter			Maximum Recommended Shaft Diameter	Recommended Housing Bore Limits	
	Inner Diameter	Outer Diameter	Length (+.000, -.010)		Minimum	Maximum
4N6-D	.250 (6.35)	.345 (8.73)	.344 (8.73)	.250 (6.35)	.343 (8.71)	.344 (8.72)
5N7-D	.313 (7.94)	.438 (11.11)	.438 (11.11)	.313 (7.94)	.437 (11.10)	.438 (11.13)
6N8-D	.375 (9.53)	.500 (12.70)	.500 (12.70)	.375 (9.53)	.499 (12.67)	.500 (12.70)
8N8-D	.500 (12.70)	.625 (15.86)	.625 (15.88)	.500 (12.70)	.624 (15.85)	.625 (15.88)
10N12-D	.625 (15.88)	.750 (19.05)	.750 (19.05)	.625 (15.86)	.749 (19.02)	.750 (19.05)
12N12-D	.750 (19.05)	.875 (22.23)	.750 (19.05)	.750 (19.05)	.874 (22.20)	.875 (22.22)
14N12-D	.875 (22.23)	1.000 (25.40)	1.000 (25.40)	.875 (22.23)	.999 (25.37)	1.000 (25.40)
16N18-D	1.000 (25.40)	1.125 (28.58)	1.125 (28.58)	1.000 (25.40)	1.124 (28.55)	1.125 (28.58)
18N18-D	1.125 (28.58)	1.250 (31.75)	1.250 (31.75)	1.125 (28.56)	1.249 (31.72)	1.250 (31.75)

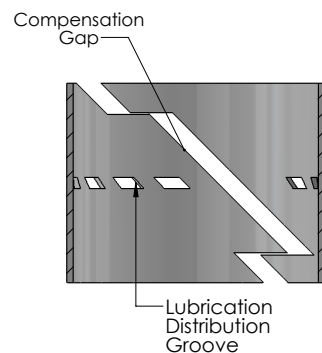
Straight Sleeve Bearings with Lubrication Groove & Carbon Steel Outer Sleeve - Inches (Millimeters)

Part Number	Bearing Inner Diameter			Maximum Recommended Shaft Diameter	Recommended Housing Bore Limits	
	Inner Diameter	Outer Diameter	Length (+.000, -.010)		Minimum	Maximum
4N6	.250 (6.35)	.344 (8.73)	.344 (8.73)	.250 (6.35)	.343 (8.71)	.3435 (8.72)
5N7	.313 (7.94)	.438 (11.11)	.438 (11.11)	.313 (7.94)	.437 (11.10)	.438 (11.13)
6N8	.375 (9.53)	.500 (12.70)	.500 (12.70)	.375 (9.53)	.499 (12.67)	.500 (12.70)
9N8	.500 (12.70)	.625 (15.86)	.625 (15.88)	.500 (12.70)	.624 (15.85)	.625 (15.88)
10N12	.625 (15.88)	.750 (19.05)	.750 (19.05)	.625 (15.86)	.749 (19.02)	.750 (19.05)
12N12	.750 (19.05)	.875 (22.23)	.750 (19.05)	.750 (19.05)	.874 (22.20)	.875 (22.22)
14N12	.875 (22.23)	1.000 (25.40)	1.000 (25.4)	.875 (22.23)	.999 (25.37)	1.000 (25.40)
16N16	1.000 (25.40)	1.125 (28.58)	1.125 (28.58)	1.000 (25.40)	1.124 (28.55)	1.125 (28.58)
18N16	1.125 (28.58)	1.250 (31.75)	1.250 (31.75)	1.125 (28.56)	1.249 (31.72)	1.250 (31.75)

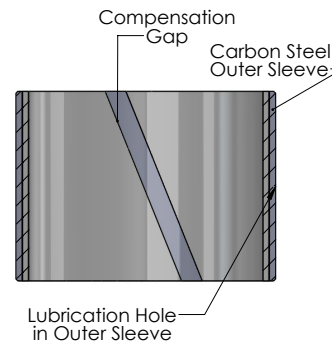
Standard



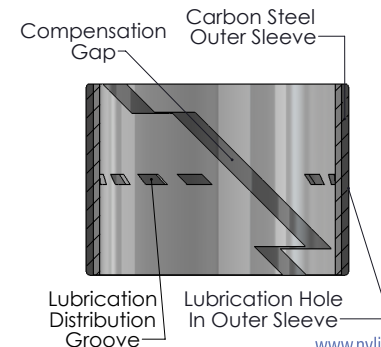
w/ Lubrication Groove



w/ Outer Sleeve



w/ Lubrication Sleeve & Outer Sleeve





**Flanged Bearing
Standard**



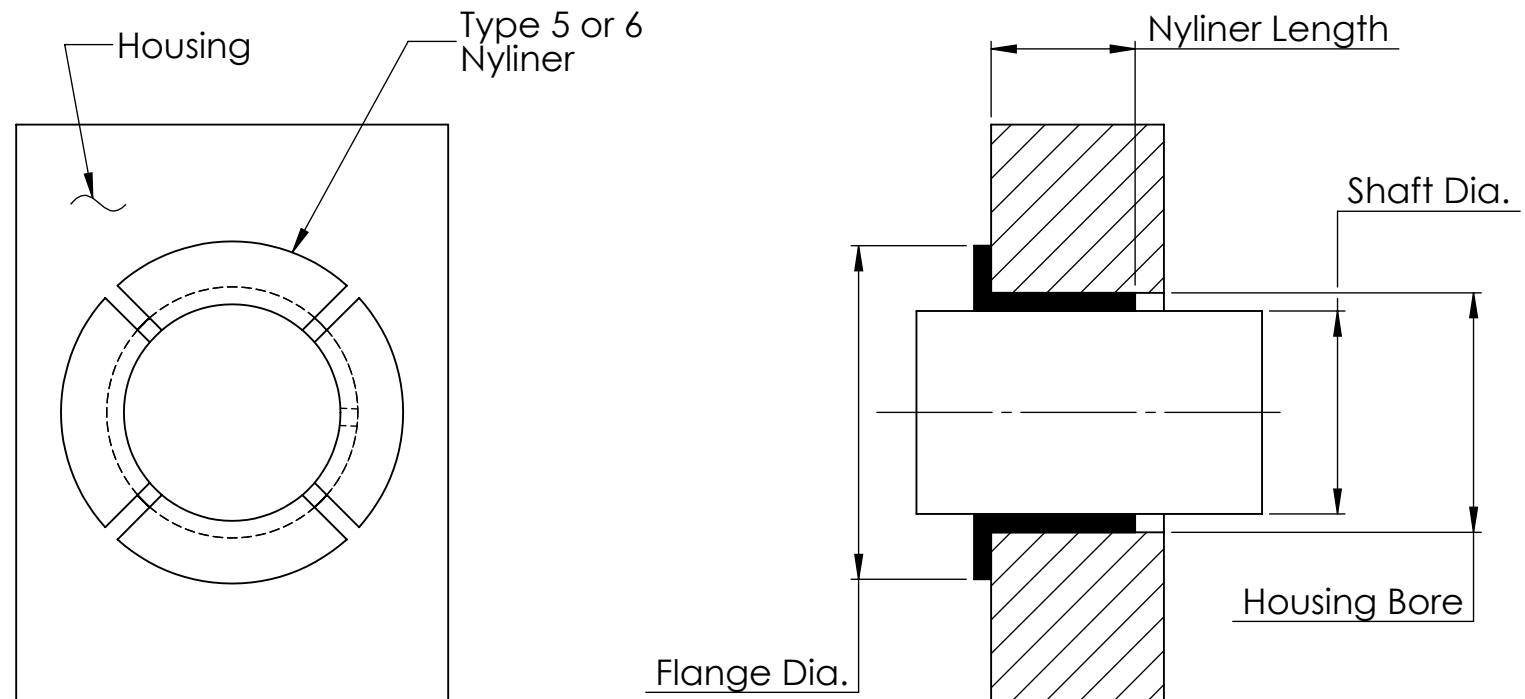
**Flanged Bearing
With Anti-Rotation Key**

Flanged Bearings

Thomson™ Nyliner™ Flanged Bearings offer more retention capability than a straight sleeve bearing for applications where radial and/or axial loads are expected. Flanged bearings can offer an anti-rotation key that eliminates both linear and rotational motion and lack of fluctuation. Thin wall construction of these bearings assures that they hold up in demanding applications.

Also, like straight sleeve bearings, these plastic flange bearings feature the standard axial compensation gap to accommodate changes in temperature and humidity. Select plastic flanged bearings are available in Thomson Nyliner high-performance polymer. Bearings will expand slightly due to frictional heat and moisture absorption. The majority of this expansion is accommodated by the compensation gap. Changes in wall thickness are minimal due to the thin wall construction of Thomson™ Nyliner™ bearings.

The minimum diametral shaft to bearing clearance normally recommended for flanged bearings is .001" (0.03mm) for bearing I.D. sizes from 1.000" (25.4mm) to 1.250" (31.75mm); and .002" (0.05mm) for I.D. sizes from 1.250" (31.75mm) to 1.500" (38.10mm). These clearances are recommended to allow proper running clearance for trouble-free operation.



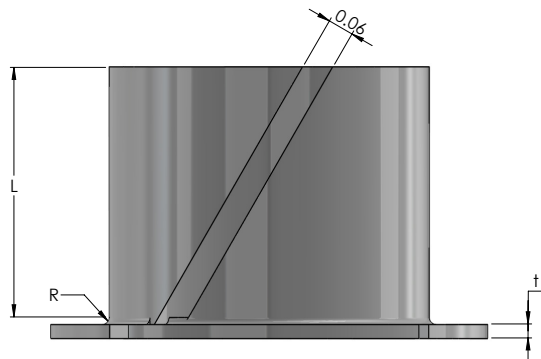
Standard Flanged Bearings - Inches (Millimeters)

Part Number	Nominal Bearing Inner Diameter	Bearing Inner Diameter		Maximum Shaft Diameter	Housing Bore	Bearing Length +0, -.0156	Radius Maximum	Flange Diameter ±.0156	Flange Thickness +.000, -.005
		Inner Diameter	Outer Diameter						
8000A	0.157 (4)	0.158 (4.025)		0.157 (4)	0.204 (5.2)	0.157 (4)	0.0157 (0.4)	0.275 (7)	.011 (279.4)
3L3-F	0.187 (4.76)	0.188 (4.79)	.001/-0.00	0.188 (4.79)	0.234 (5.94)	0.187 (4.76)	0.010 (0.25)	0.312 (7.94)	.025 (0.64)
8001A	0.196 (5)	0.197 (5.025)		0.196 (5)	0.244 (6.2)	0.196 (5)	0.0157 (0.4)	0.315 (8)	.011 (279.4)
8002A	0.236 (6)	0.237 (6.025)		0.236 (6)	0.283 (7.2)	0.236 (6)	0.0157 (0.4)	0.374 (9.5)	.011 (279.4)
4L4-F	0.250 (6.35)	0.251 (6.38)	.001/-0.00	0.251 (6.38)	0.296 (7.53)	0.250 (6.35)	0.010 (0.25)	0.406 (10.32)	.025 (0.64)
5L5-F	0.312 (7.94)	0.313 (7.96)	.001/-0.00	0.313 (7.96)	0.374 (9.51)	0.312 (7.94)	0.015 (0.38)	0.5 (12.70)	.030 (0.76)
5L7-F	0.312 (7.94)	0.313 (7.96)	.001/-0.00	0.313 (7.96)	0.374 (9.51)	0.437 (11.11)	0.015 (0.38)	0.5 (12.70)	.030 (0.76)
5L10-F	0.312 (7.94)	0.313 (7.96)	.001/-0.00	0.313 (7.96)	0.374 (9.51)	0.625 (15.88)	0.015 (0.38)	0.5 (12.70)	.030 (0.76)
8003A	0.315 (8)	0.315 (8.025)		0.315 (8)	0.378 (9.6)	0.315 (8)	0.0157 (0.4)	0.472 (12)	.032 (0.80)
6L6-F	0.375 (9.53)	0.376 (9.55)	.001/-0.00	0.376 (9.55)	0.437 (11.10)	0.375 (9.35)	0.015 (0.38)	0.593 (15.08)	.030 (0.76)
6L11-F	0.375 (9.53)	0.376 (9.55)	.001/-0.00	0.376 (9.55)	0.437 (11.10)	0.687 (17.45)	0.015 (0.38)	0.593 (15.08)	.030 (0.76)
8004A	0.393 (10)	0.394 (10.025)		0.393 (10)	0.456 (11.6)	0.393 (10)	0.0157 (0.4)	0.590 (15)	.032 (0.80)
7L7-F	0.437 (11.12)	0.438 (11.14)	.001/-0.00	0.438 (11.14)	0.499 (12.69)	0.437 (11.11)	0.015 (0.38)	0.656 (16.68)	.030 (0.76)
8005A	0.472 (12)	0.473 (12.025)		0.472 (12)	0.535 (13.6)	0.472 (12)	0.0157 (0.4)	0.708 (18)	.032 (0.80)
8L31/2-F	0.500 (12.70)	0.501 (12.73)	.001/-0.00	0.501 (12.73)	0.562 (14.27)	0.218 (5.55)	0.015 (0.38)	0.75 (19.05)	.030 (0.76)
8L51/2-F	0.500 (12.70)	0.501 (12.73)	.001/-0.00	0.501 (12.73)	0.562 (14.27)	0.343 (8.73)	0.015 (0.38)	0.75 (19.05)	.030 (0.76)
8L8-F	0.500 (12.70)	0.501 (12.73)	.001/-0.00	0.501 (12.73)	0.562 (14.27)	0.500 (12.70)	0.015 (0.38)	0.75 (19.05)	0.03 (0.76)
8L12-F	0.500 (12.70)	0.501 (12.73)	.001/-0.00	0.501 (12.73)	0.562 (14.27)	0.718 (18.25)	0.015 (0.38)	0.75 (19.05)	0.03 (0.76)
8006A	0.551 (14)	0.552 (14.025)		0.551 (14)	0.614 (15.6)	0.551 (14)	0.0157 (0.4)	0.826 (21)	0.0315 (0.8)
10L51/2-F	0.625 (15.88)	0.626 (15.90)	.001/-0.00	0.626 (15.90)	0.687 (17.45)	0.343 (8.73)	0.015 (0.38)	0.937 (23.81)	0.03 (0.76)
10L7-F	0.625 (15.88)	0.626 (15.90)	.001/-0.00	0.626 (15.90)	0.687 (17.45)	0.437 (11.11)	0.015 (0.38)	0.937 (23.81)	0.03 (0.76)
10L10-F	0.625 (15.88)	0.626 (15.90)	.001/-0.00	0.626 (15.90)	0.687 (17.45)	0.625 (15.88)	0.015 (0.38)	0.937 (23.81)	0.03 (0.76)
10L14-F	0.625 (15.88)	0.626 (15.90)	.001/-0.00	0.626 (15.90)	0.687 (17.45)	0.875 (22.22)	0.015 (0.38)	0.937 (23.81)	0.03 (0.76)
10L18-F	0.625 (15.88)	0.626 (15.90)	.001/-0.00	0.626 (15.90)	0.687 (17.45)	1.125 (28.56)	0.015 (0.38)	0.937 (23.81)	0.03 (0.76)
8007A	0.629 (16)	0.630 (16.025)		0.629 (16)	0.692 (17.6)	0.629 (16)	0.0157 (0.4)	0.944 (24)	0.0315 (0.8)
12L12-F	0.750 (19.05)	0.751 (19.08)	.001/-0.00	0.751 (19.08)	0.812 (20.62)	0.750 (19.05)	0.015 (0.38)	1.125 (28.58)	0.03 (0.76)
12L18-F	0.750 (19.05)	0.751 (19.08)	.001/-0.00	0.751 (19.08)	0.812 (20.62)	1.125 (28.56)	0.015 (0.38)	1.125 (28.58)	0.03 (0.76)
8008A	0.787 (20)	0.788 (20.025)		0.787 (20)	0.850 (21.6)	0.787 (20)	0.0157 (0.4)	1.181 (30)	0.0315 (0.8)
14L71/2-F	0.875 (22.22)	0.876 (22.25)	.001/-0.00	0.876 (22.25)	0.937 (23.80)	0.468 (11.90)	0.015 (0.38)	1.312 (33.34)	0.03 (0.76)
14L14-F	0.875 (22.22)	0.876 (22.25)	.001/-0.00	0.876 (22.25)	0.937 (23.80)	0.875 (22.23)	0.015 (0.38)	1.312 (33.34)	0.03 (0.76)
8009A	0.984 (25)	0.985 (25.025)		0.984 (25)	1.078 (27.4)	0.984 (25)	0.0157 (0.4)	1.476 (37.5)	0.0472 (1.2)
16L16-F	1.00 (25.4)	1.001 (25.44)	.0015/-0.00	1.001 (25.44)	1.093 (27.77)	1.000 (25.4)	0.020 (0.51)	1.500 (38.1)	0.045 (1.14)
18L18-F	1.125 (28.58)	1.126 (28.61)	.0015/-0.00	1.126 (28.61)	1.218 (30.95)	1.125 (28.56)	0.020 (0.51)	1.687 (42.86)	0.045 (1.14)
20L20-F	1.25 (31.75)	1.251 (31.79)	.0015/-0.00	1.251 (31.79)	1.343 (34.12)	1.250 (31.75)	0.020 (0.51)	1.875 (47.63)	0.045 (1.14)
24L24-F	1.50 (38.10)	1.502 (38.15)	.002/-0.00	1.502 (38.15)	1.624 (41.26)	1.500 (38.1)	0.025 (0.64)	2.25 (57.15)	0.06 (1.52)

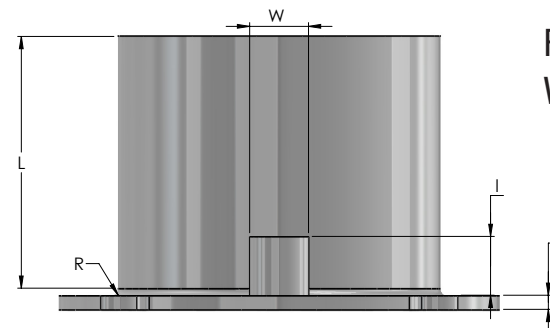
Flanged Bearings With Anti-Rotation Key - Inches (Millimeters)

Part Number	Nominal Bearing Inner Diameter	Bearing Inner Diameter		Maximum Shaft Diameter	Housing Bore	Bearing Length +0, -.0156	Radius Maximum	Flange Diameter ±.0156	Flange Thickness +.000, -.005	Anti-Rotation Key Width +0, -.0156	Anti-Rotation Key Height +0, -.0156
		Inner Diameter	Outer Diameter								
3L3-FK	.187 (4.76)	.188 (4.79)	.001/-0.000	.188 (4.79)	.234 (5.94)	.187 (4.76)	.010 (0.25)	.312 (7.94)	.025 (0.64)	.062 (1.59)	.062 (1.59)
4L4-FK	.250 (6.35)	.251 (6.38)	.001/-0.000	.251 (6.38)	.296 (7.53)	.250 (6.35)	.010 (0.25)	.406 (10.32)	.025 (0.64)	.062 (1.59)	.062 (1.59)
5L5-FK	.312 (7.94)	.313 (7.96)	.001/-0.000	.313 (7.96)	.374 (9.51)	.3125 (7.94)	.015 (0.38)	.500 (12.70)	.030 (0.76)	.093 (2.38)	.093 (2.38)
5L7-FK	.312 (7.94)	.313 (7.96)	.001/-0.000	.313 (7.96)	.374 (9.51)	.3125 (7.94)	.015 (0.38)	.500 (12.70)	.030 (0.76)	.093 (2.38)	.093 (2.38)
5L10-FK	.312 (7.94)	.313 (7.96)	.001/-0.000	.313 (7.96)	.374 (9.51)	.3125 (7.94)	.015 (0.38)	.500 (12.70)	.030 (0.76)	.093 (2.38)	.093 (2.38)
6L6-FK	.375 (9.53)	.376 (9.55)	.001/-0.000	.376 (9.55)	.437 (11.10)	.375 (9.35)	.015 (0.38)	.593 (15.08)	.030 (0.76)	.093 (2.38)	.093 (2.38)
6L11-FK	.375 (9.53)	.376 (9.55)	.001/-0.000	.376 (9.55)	.437 (11.10)	.375 (9.53)	.015 (0.38)	.593 (15.08)	.030 (0.76)	.093 (2.38)	.093 (2.38)
7L7-FK	.437 (11.12)	.438 (11.14)	.001/-0.000	.438 (11.14)	.499 (12.69)	.437 (11.11)	.015 (0.38)	.656 (16.68)	.030 (0.76)	.093 (2.38)	.093 (2.38)
8L31/2-FK	.500 (12.70)	.501 (12.73)	.001/-0.000	.501 (12.73)	.562 (14.27)	.500 (12.70)	.015 (0.38)	.750 (19.05)	.030 (0.76)	.093 (2.38)	.093 (2.38)
8L51/2-FK	.500 (12.70)	.501 (12.73)	.001/-0.000	.501 (12.73)	.562 (14.27)	.500 (12.70)	.015 (0.38)	.750 (19.05)	.030 (0.76)	.093 (2.38)	.093 (2.38)
8L8-FK	.500 (12.70)	.501 (12.73)	.001/-0.000	.501 (12.73)	.562 (14.27)	.500 (12.70)	.015 (0.38)	.750 (19.05)	.030 (0.76)	.093 (2.38)	.093 (2.38)
8L12-FK	.500 (12.70)	.501 (12.73)	.001/-0.000	.501 (12.73)	.562 (14.27)	.500 (12.07)	.015 (0.38)	.750 (19.05)	.030 (0.76)	.125 (3.18)	.125 (3.18)
10L51/2-FK	.625 (15.88)	.626 (15.90)	.001/-0.000	.626 (15.90)	.687 (17.45)	.625 (15.88)	.015 (0.38)	.938 (23.81)	.030 (0.76)	.125 (3.18)	.125 (3.18)
10L7-FK	.625 (15.88)	.626 (15.90)	.001/-0.000	.626 (15.90)	.687 (17.45)	.625 (15.88)	.015 (0.38)	.938 (23.81)	.030 (0.76)	.125 (3.18)	.125 (3.18)
10L10-FK	.625 (15.88)	.626 (15.90)	.001/-0.000	.626 (15.90)	.687 (17.45)	.625 (15.88)	.015 (0.38)	.938 (23.81)	.030 (0.76)	.125 (3.18)	.125 (3.18)
10L14-FK	.625 (15.88)	.626 (15.90)	.001/-0.000	.626 (15.90)	.687 (17.45)	.625 (15.88)	.015 (0.38)	.938 (23.81)	.030 (0.76)	.125 (3.18)	.125 (3.18)
10L18-FK	.625 (15.88)	.626 (15.90)	.001/-0.000	.626 (15.90)	.687 (17.45)	.625 (15.88)	.015 (0.38)	.938 (23.81)	.030 (0.76)	.125 (3.18)	.125 (3.18)
12L12-FK	.750 (19.05)	.751 (19.08)	.001/-0.000	.751 (19.08)	.812 (20.62)	.750 (19.05)	.015 (0.38)	1.125 (28.58)	.030 (0.76)	.125 (3.18)	.125 (3.18)
12L18-FK	.750 (19.05)	.751 (19.08)	.001/-0.000	.751 (19.08)	.812 (20.62)	.750 (19.05)	.015 (0.38)	1.125 (28.58)	.030 (0.76)	.125 (3.18)	.125 (3.18)
14L71/2-FK	.875 (22.22)	.876 (22.25)	.001/-0.000	.876 (22.25)	.937 (23.80)	.875 (22.23)	.015 (0.38)	1.312 (33.34)	.030 (0.76)	.125 (3.18)	.125 (3.18)
14L14-FK	.875 (22.22)	.876 (22.25)	.001/-0.000	.876 (22.25)	.937 (23.80)	.875 (22.23)	.015 (0.38)	1.312 (33.34)	.030 (0.76)	.125 (3.18)	.125 (3.18)
16L16-FK	1.000 (25.4)	1.001 (25.44)	.0015/-0.000	1.001 (25.44)	1.093 (27.77)	1.000 (25.4)	.020 (0.51)	1.500 (38.1)	.045 (1.14)	.156 (3.97)	.156 (3.97)
18L18-FK	1.125 (28.58)	1.126 (28.61)	.0015/-0.000	1.126 (28.61)	1.218 (30.95)	1.125 (28.56)	.020 (0.51)	1.687 (42.86)	.045 (1.14)	.156 (3.97)	.156 (3.97)
20L20-FK	1.250 (31.75)	1.251 (31.79)	.0015/-0.000	1.251 (31.79)	1.343 (34.12)	1.250 (31.75)	.020 (0.51)	1.875 (47.63)	.045 (1.14)	.156 (3.97)	.156 (3.97)
24L24-FK	1.500 (38.10)	1.502 (38.15)	.002/-0.000	1.502 (38.15)	1.624 (41.26)	1.500 (38.1)	.025 (0.64)	2.250 (57.15)	.060 (1.52)	.187 (4.76)	.187 (4.76)

Flanged Bearings Standard



Flanged Bearings With Anti-Rotation Key





**Double Flanged Bearing
Standard**

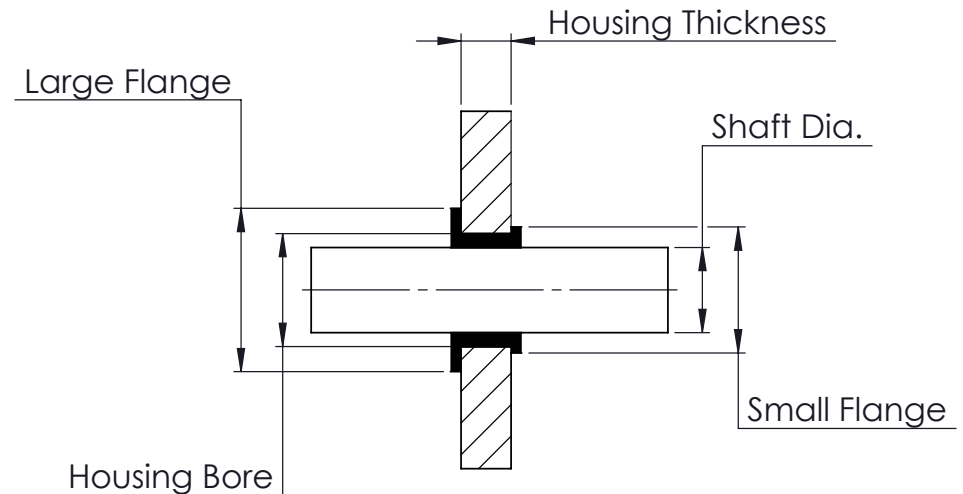
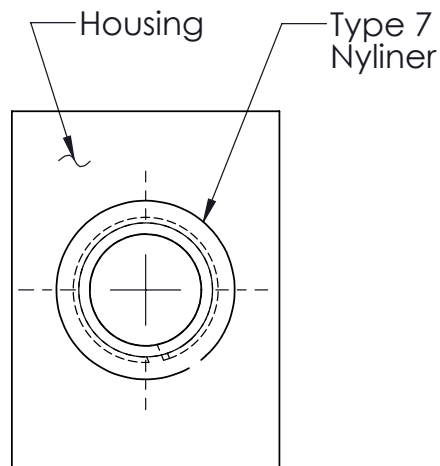
Double Flanged Bearings

Thomson™ Nyliner™ Double Flanged Bearings are designed with one flange larger than the other to ensure bearing retention where thrust loads are present. They are also used with thin plates and similar applications.

These bearings have a Snap-In feature – our standard axial compensation gap – that makes installation easy by allowing the smaller of the flanges to be collapsed and spiraled through the mounting hole. Light finger pressure, exerted to the left of the gap, spirals the bearing into position. This feature also ensures position and function with fluctuations in temperature and humidity.

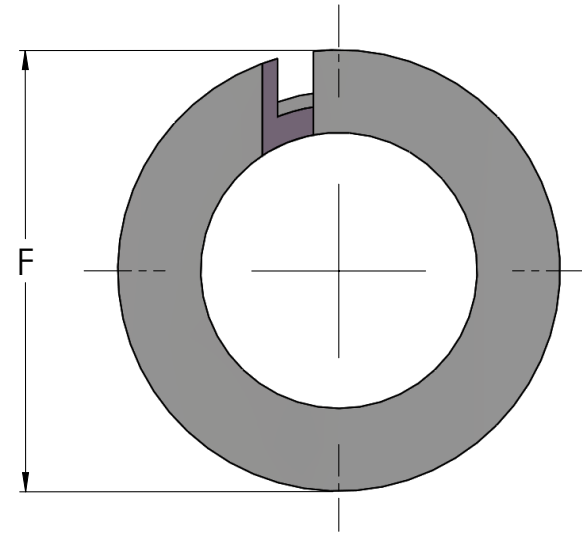
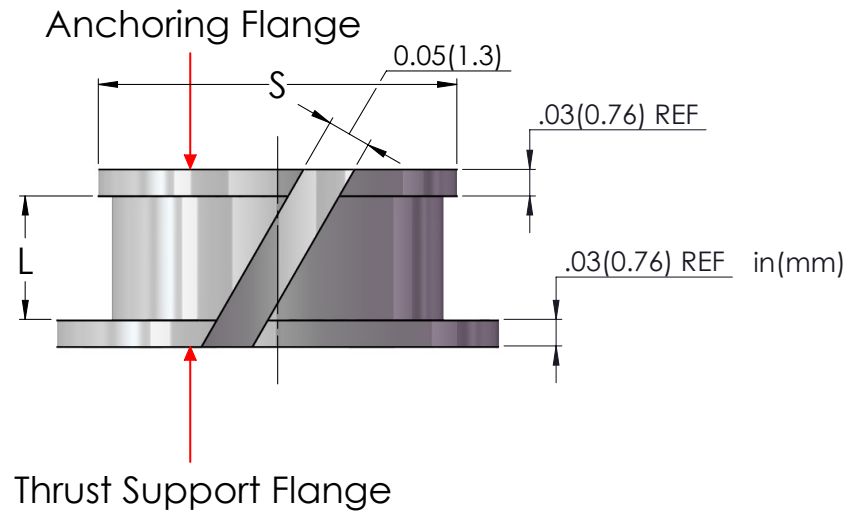
Double flanged bearings offer all the benefits of traditional metal bearings combined with the advantages of conventionally installed straight sleeve and flanged bearings. These snap-in bearings are also available in high performance (TEP) polymers.

The minimum diametrical shaft to bearing clearance recommended for double flanged bearings is .001" (0.25mm). This allows proper running clearance for trouble-free operation. The compensation gap accommodates the slight expansion due to frictional heat and moisture absorption.



Double Flanged Bearings - Inches (Millimeters)

Part Number	Maximum Shaft Diameter	Minimum Housing Bore	Bearing Inner Diameter +.003, -0.00	Larger Flange Diameter (±1/64)	Smaller Flange Diameter (±1/64)	Bearing Length (+1/64, -0)	Recommended Plate Thickness
8010A	.1181 (3.00)	.1654 (4.2)	.1191 (3.025)	.2362 (6.00)	.1890 (4.8)	.079 (2.00)	.057 (1.45) to .076 (1.92)
2L1-FF	.125 (3.18)	.1718 (4.36)	.126 (3.20)	.250 (6.35)	.1875 (4.76)	.078 (1.98)	.040 (1.02) to .075 (1.91)
2L2-FF	.125 (3.18)	.1718 (4.36)	.126 (3.20)	.250 (6.35)	.1875 (4.76)	.140 (3.56)	.072 (1.83) to .135 (3.43)
8011A	.1575 (4.00)	.2047 (5.2)	.1585 (4.025)	.2756 (7.00)	.2323 (5.9)	.079 (2.00)	.057 (1.45) to .076 (1.92)
3L1-FF	.1875 (4.76)	.2343 (5.95)	.1885 (4.79)	.3125 (7.94)	.250 (6.35)	.078 (1.98)	.040 (1.02) to .075 (1.91)
3L2-FF	.1875 (4.76)	.2343 (5.95)	.1885 (4.79)	.3125 (7.94)	.250 (6.35)	.140 (3.56)	.072 (1.83) to .135 (3.43)
8012A	.1969 (5.00)	.2441 (6.2)	.1978 (5.025)	.3150 (8.00)	.2677 (6.8)	.079 (2.00)	.057 (1.45) to .076 (1.92)
8013A	.2362 (6.00)	.2835 (7.2)	.2372 (6.025)	.4331 (11.00)	.3071 (7.8)	.079 (2.00)	.057 (1.45) to .076 (1.92)
4L1-FF	.250 (6.35)	.3125 (7.94)	.251 (6.38)	.4375 (11.11)	.3437 (8.73)	.078 (1.98)	.040 (1.02) to .075 (1.91)
4L2-FF	.250 (6.35)	.3125 (7.94)	.251 (6.38)	.4375 (11.11)	.3437 (8.73)	.140 (3.56)	.072 (1.83) to .135 (3.43)
5L1-FF	.3125 (7.94)	.375 (9.53)	.3135 (7.96)	.500 (12.70)	.4062 (10.32)	.078 (1.98)	.040 (1.02) to .075 (1.91)
5L2-FF	.3125 (7.94)	.375 (9.53)	.3135 (7.96)	.500 (12.70)	.4062 (10.32)	.140 (3.56)	.072 (1.83) to .135 (3.43)
8014A	.3150 (8.00)	.3780 (9.6)	.3159 (8.025)	.5118 (13.00)	.4094 (10.4)	.079 (2.00)	.057 (1.45) to .076 (1.92)
6L1-FF	.375 (9.53)	.4375 (11.11)	.376 (9.55)	.5625 (14.29)	.4687 (11.90)	.078 (1.98)	.040 (1.02) to .075 (1.91)
6L2-FF	.375 (9.53)	.4375 (11.11)	.376 (9.55)	.5625 (14.29)	.4687 (11.90)	.140 (3.56)	.072 (1.83) to .135 (3.43)
8015A	.3937 (10.00)	.4567 (11.6)	.3947 (10.025)	.5906 (15.00)	.4882 (12.4)	0.079 (2.00)	.057 (1.45) to .076 (1.92)
7L1-FF	.4375 (11.11)	.500 (12.70)	.4385 (11.14)	.625 (15.88)	.5312 (13.49)	.078 (1.98)	.040 (1.02) to .075 (1.91)
7L2-FF	.4375 (11.11)	.500 (12.70)	.4385 (11.14)	.625 (15.88)	.5312 (13.49)	.140 (3.56)	.072 (1.83) to .135 (3.43)
8016A	.4724 (12.00)	.5354 (13.6)	.4734 (12.025)	.6693 (17.00)	.5669 (14.4)	.079 (2.00)	.057 (1.45) to .076 (1.92)
8L1-FF	.500 (12.70)	.5625 (14.29)	.501 (12.73)	.6875 (17.46)	.5937 (15.08)	.078 (1.98)	.040 (1.02) to .075 (1.91)
8L2-FF	.500 (12.70)	.5625 (14.29)	.501 (12.73)	.6875 (17.46)	.5937 (15.08)	.140 (3.56)	.072 (1.83) to .135 (3.43)
10L1-FF	.625 (15.88)	.6875 (17.46)	.626 (15.90)	.875 (22.23)	.7187 (18.25)	.078 (1.98)	.040 (1.02) to .075 (1.91)
10L2-FF	.625 (15.88)	.6875 (17.46)	.626 (15.90)	.875 (22.23)	.7187 (18.25)	.140 (3.56)	.072 (1.83) to .135 (3.43)
12L1-FF	.750 (19.05)	.8125 (20.64)	.7501 (19.053)	1.000 (25.40)	.8437 (21.43)	.078 (1.98)	.040 (1.02) to .075 (1.91)
12L2-FF	.750 (19.05)	.8125 (20.64)	.7501 (19.053)	1.000 (25.40)	.8437 (21.43)	.140 (3.56)	.072 (1.83) to .135 (3.43)



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