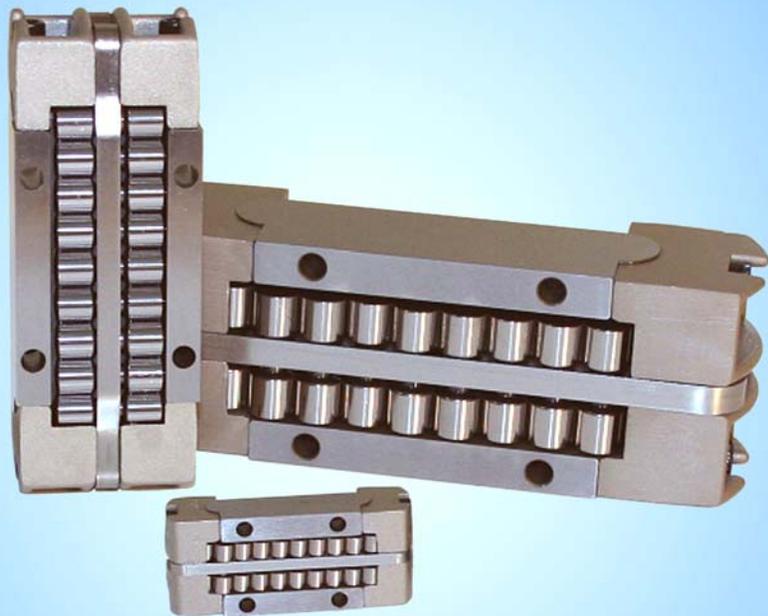


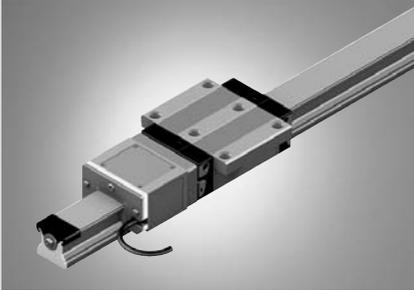
Tychoway Linear Roller Bearings

The Drive and Control Company

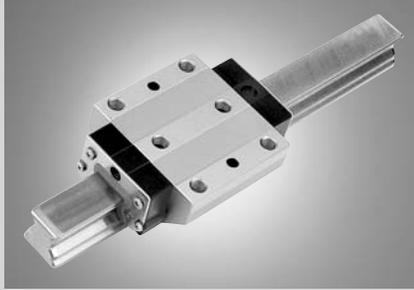


Linear Motion and Assembly Technologies

Ball Rail Systems



Roller Rail Systems



Linear Bushings and Shafts



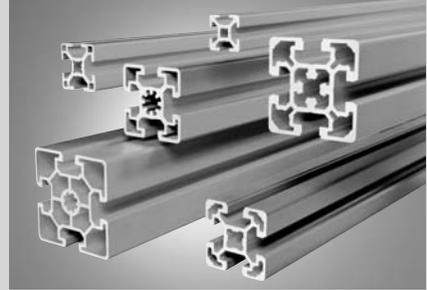
Ball Screw Drives



Linear Motion Systems



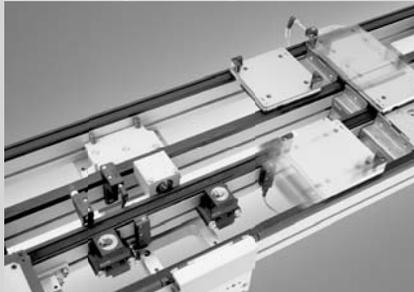
Basic Mechanical Elements



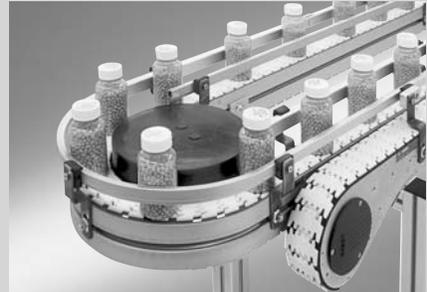
Manual Production Systems



Assembly Conveyors



VarioFlow Conveyors



Linear Roller Bearings

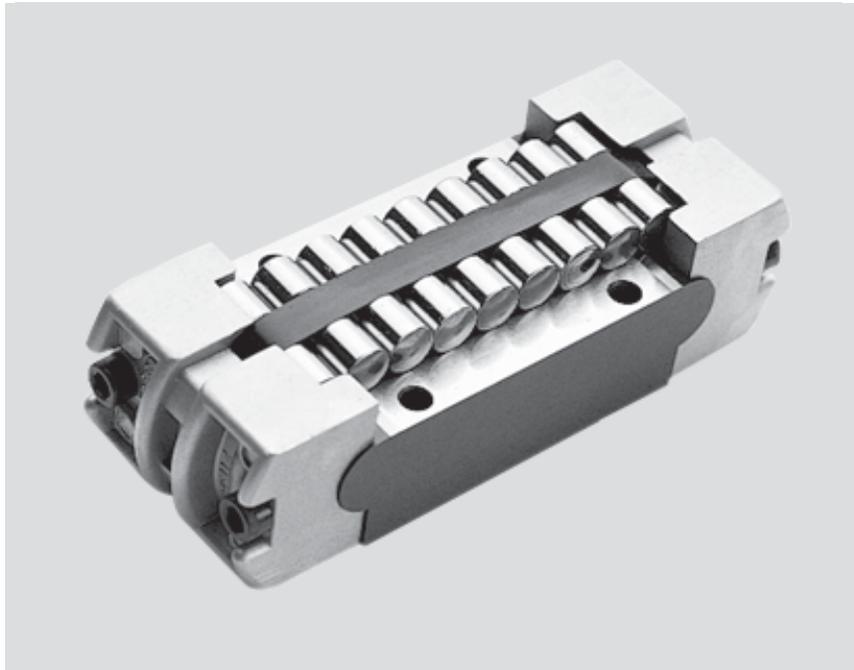
Product Overview	4
Design Features	5
Typical Applications	6
Mounting Arrangements	7
Tychoway Inch Series	8
Tychoway Metric Series	9
Spring Pad/Options	10
Tycho-Gibb Options	11
Rails	12
Installation	13
Preload	14
Life Calculations	15
Operating Data	16
Test Data	17

Tychoway Linear Roller Bearings

The extremely low friction of Tychoway Linear Roller Bearings enables them to provide very accurate positioning in machine slides by virtually eliminating the *stick-slip* phenomenon. The combination of positioning and travel accuracy benefits afforded by Tychoway Linear roller Bearings meet the world's toughest competition.

Tychoway recirculating Linear Roller Bearings provide predictable, repeatable positioning accuracy with minimum service requirements. A diverse range of sizes allows use in applications from compact dies to large machine tools. Tychoway Bearings have static load capacities rated from 4,330 to 122,000 lbs. The smallest bearing, only 0.56 inches wide, can be mounted in very compact assemblies. Larger sizes are used in machine tools, paper

- Made in the USA by skilled American machinists
- Special Buna band gives continuous guidance to the rollers, minimizing roller skew
- Made of high-quality, high carbon alloy bearing steel
- Hardened to 60 Rockwell C minimum to insure high capacity and long life
- High race radius to roller diameter ratio enhances roller recirculation and minimized friction, eliminating *stick-slip* forces
- Low friction rolling element design provides a system coefficient of friction of .005 or better for most applications
- Open load zone design provides space for contaminants to be forced away from the roller path



Applications

Tychoway Linear Roller Bearings are used in a wide variety of applications. A choice of styles and sizes provide the special machine builder and OEM designer flexibility in bearing selection. Straightforward installation methods reduce time in assembly and final machine adjustments.

Machine Tools

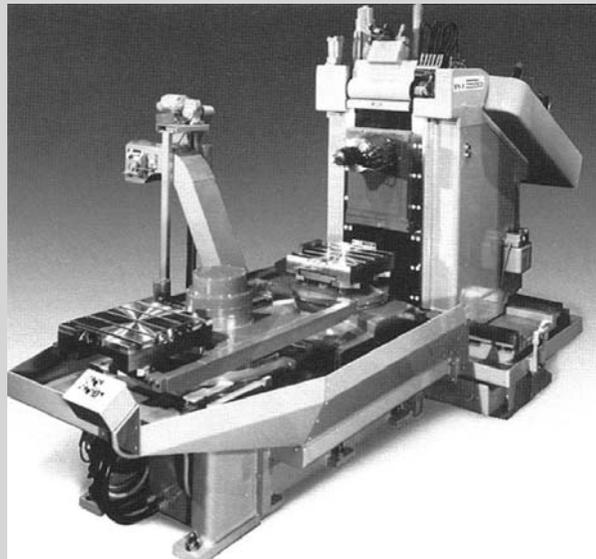
- Machining centers
- Slant bed turning machines
- Traveling column milling machines
- Reciprocating surface grinders
- Automatic drilling machines
- CNC turret lathes
- Friction welders

Lasers and EDM

- Laser cutting
- Automatic welding machines
- Electric discharge machines

Special Applications

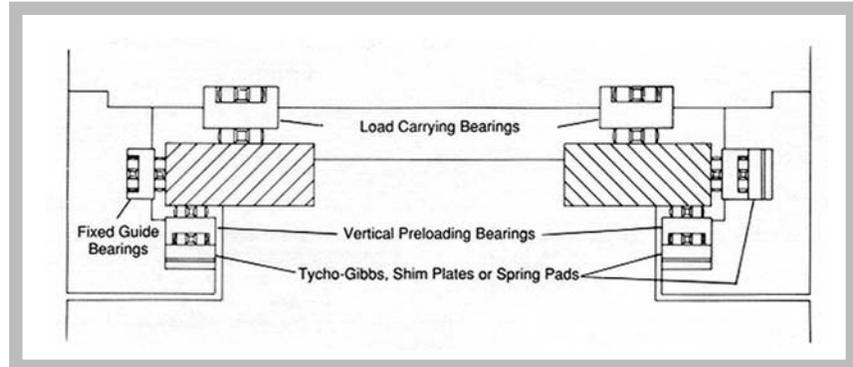
- Aircraft assembly gantries
- Seismic testing equipment
- Can production equipment



Mounting Arrangements

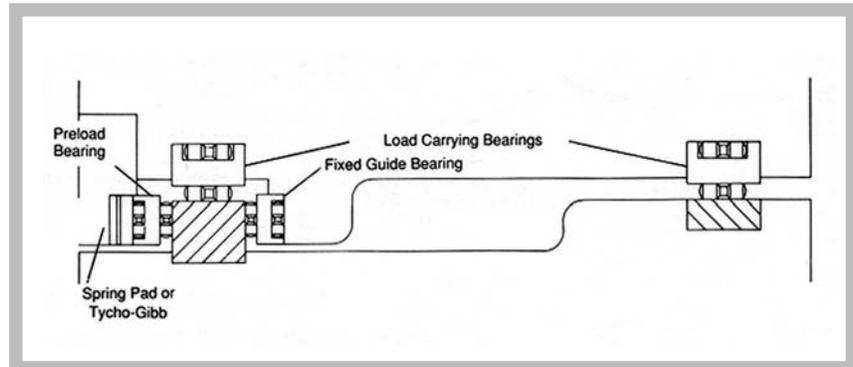
Horizontal or Vertical

This arrangement provides complete anti-friction support in all planes, as well as resistance to moment loading. Preloading permits low friction movement without looseness in the assembly. The opposed bearings can be mounted on Tychoway Spring Pads for a preset dynamic preload or on Tycho-Gibbs for maximum stiffness.



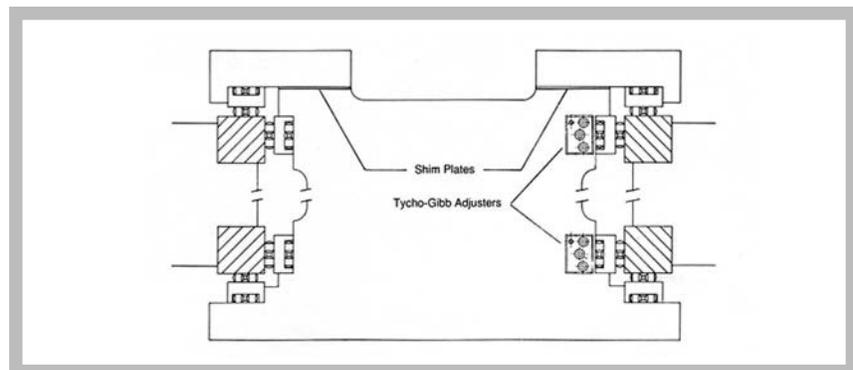
Horizontal Gravity Loaded

This arrangement provides economical design where no uplift loads are present. It is used in a horizontal plane with gravity preload on the main load carrying bearings. A design popular in grinder and general purpose slides, the guide bearings can be preloaded with a Tychoway Spring Pad or a Tycho-Gibbs for maximum stiffness.



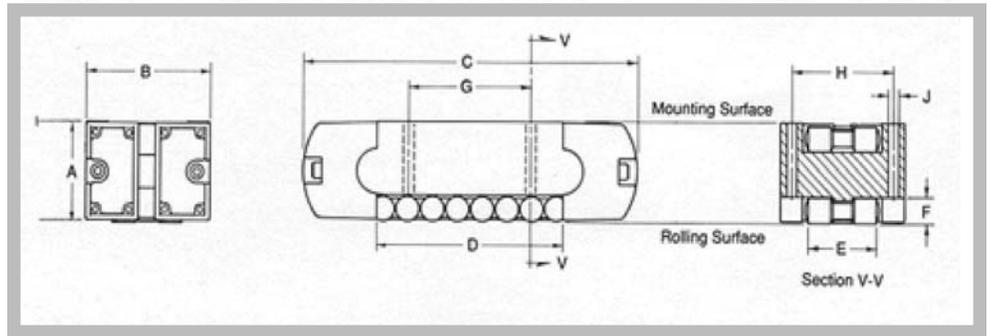
Ram Support

This bearing arrangement is ideal for vertical or horizontal rams, providing low friction motion with no looseness in the assembly. The opposed bearing should be preloaded with Tycho-Gibbs for maximum stiffness.



Linear Roller Bearings

Original Tychoway Inch Series

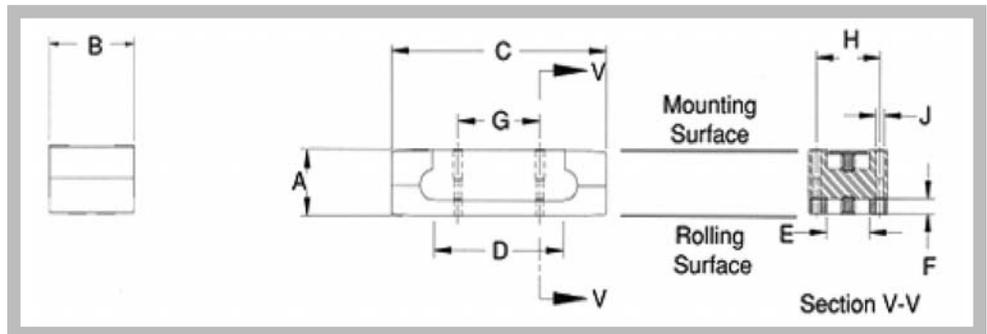


Part Number	Old Part Number	App. Weight lb.	Inches			Effect. Length D inches	Effect. Width E inches	Roller Dia. F inches	Mounting Dim.		S.H.C.S. Size J	Load Rating		Stiffness lb/inch
			Height A	Width B	Length C				G±.002	H±.002		Static C ₀ lb.	Dynamic C lb.	
R987144779	21050	0.2	0.5625 0.5622	0.875 0.873	2.00	1.12	0.450	0.150	0.750	0.672	No. 4	4,330	2,220	3.2 x 10 ⁶
R987144824	21100	0.5	0.7500 0.7497	1.000 0.998	2.88	1.50	0.600	0.200	1.000	0.812	No. 4	7,920	4,240	5.1 10 ⁶
R987144863	21150	1.3	1.1250 1.1247	1.500 1.498	4.00	2.25	0.900	0.300	1.500	1.219	No. 8	17,260	9,830	7.0 x 10 ⁶
R987144726	21200	3.3	1.5000 1.4997	2.000 1.997	5.50	3.00	1.200	0.400	2.000	1.625	No. 10	29,460	17,750	9.5 x 10 ⁶
R987144874	21250	11.0	2.2500 2.2497	3.000 2.997	8.12	4.50	1.800	0.600	3.000	2.437	0.25	68,200	43,300	15.3 x 10 ⁶
R987144765	21300	25.0	3.0000 2.9997	4.000 3.996	11.00	6.00	2.400	0.800	4.000	3.250	0.31	122,000	81,000	19.1 x 10 ⁶

Part Number	Old Part Number	App. Weight lb.	Inches			Effect. Length D inches	Effect. Width E inches	Roller Dia. F inches	Mounting Dim.		S.H.C.S. Size J	Load Rating		Stiffness lb/inch
			Height A	Width B	Length C				G±.002	H±.002		Static C ₀ lb.	Dynamic C lb.	
R987144780	21080	0.2	0.5625 0.5622	0.875 0.873	2.00	1.12	0.450	0.150	0.750	0.672	No. 4	4,330	2,220	3.2 x 10 ⁶
R987144795	21130	0.5	0.7500 0.7497	1.000 0.998	2.88	1.50	0.600	0.200	1.000	0.812	No. 4	7,920	4,240	5.1 10 ⁶
R987144866	21180	1.3	1.1250 1.1247	1.500 1.498	4.00	2.25	0.900	0.300	1.500	1.219	No. 8	17,260	9,830	7.0 x 10 ⁶
R987144720	21230	3.3	1.5000 1.4997	2.000 1.997	5.50	3.00	1.200	0.400	2.000	1.625	No. 10	29,460	17,750	9.5 x 10 ⁶
R987144746	21280	11.0	2.2500 2.2497	3.000 2.997	8.12	4.50	1.800	0.600	3.000	2.437	0.25	68,200	43,300	15.3 x 10 ⁶

* NOTE: Buna band equipped Tychoway Bearings are recommended. Metal clips are available as an alternate and are advantageous in certain applications. See page 9

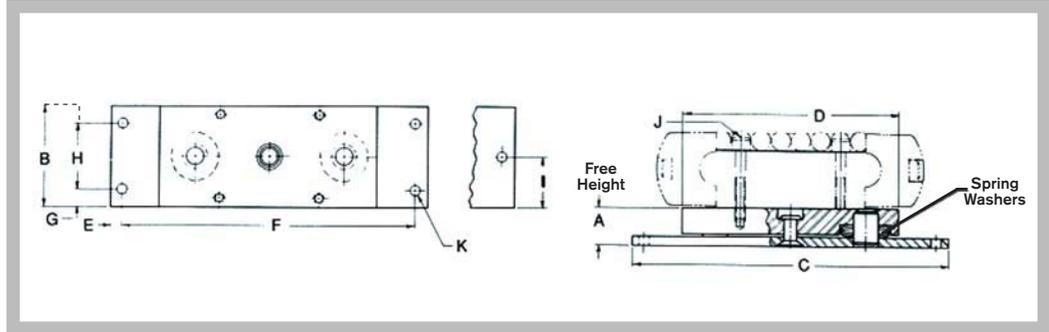
Tycho II Inch Series



Part Number	Old Part Number	Description	App. Weight lb.	Inches			Effect. Length D inches	Effect. Width E inches	Roller Dia. F inches	Mounting Dim.		S.H.C.S. Size J	Load Rating		Stiffness lb/inch
				Height A	Width B	Length C				G±.002	H±.002		Static C ₀ lb.	Dynamic C lb.	
R987144742	31250	#18 TYCHO II BEARING	13.3	2.2500 2.2497	3.000 2.997	7.87	4.63	1.643	0.551	3.000	2.437	0.25	77,260	45,700	2.01 x 10 ⁶
R987144704	31300	#24 TYCHO II BEARING	33.0	3.0000 2.9997	4.000 3.996	11.0	6.44	2.334	0.787	4.000	3.250	0.31	170,720	99,130	3.15 x 10 ⁶

Spring Pad/Options

Spring Pad for Dynamic Preload



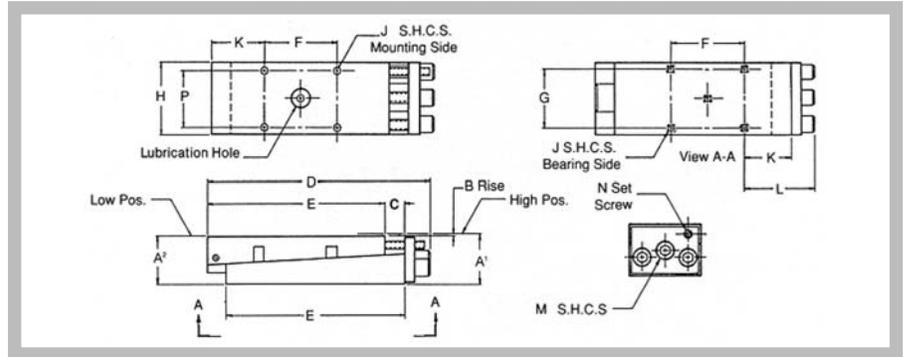
Part Number	Old Part Number	Description	Use with Bearing Part #	Free height A	Recommended installed		Solid height	Spring load at solid height	Width B	Length C	D	E	Mounting Dimensions				S.H.C.S. Size K	S.H.C.S. Size J
					Height	*Spring load							F	G	H	L		
R987144775	21905	#4 Spring Pad	R987144779	.408 .398	.390 .385	200 lb 250 lb	0.375	370 lb	0.84	2.62	2.00	0.16	2.3125	--	--	0.42	No. 8	#4-40 0.62" long
R987144812	21910	#6 Spring Pad Assembly	R987144824	.480 .470	.454 .447	400 lb 500 lb	0.437	600 lb	0.97	3.75	2.50	0.16	3.4375	--	--	0.48	No. 8	#4-40 0.75" long
R987144853	21915	#9 Spring Pad Assembly	R987144863	.539 .529	.517 .510	800 lb 1060 lb	0.500	1500 lb	1.47	4.75	3.25	0.16	4.4375	0.234	1.000	--	No. 8	#8-32 1.00" long
R987144715	21920	#12 Spring Pad Assembly	R987144726	.665 .655	.641 .635	1600 lb 2000 lb	0.625	2700 lb	1.97	6.25	4.50	0.19	5.875	0.172	1.625	--	No. 10	#10-32 1.50" long
R987144736	21925	#18 Spring Pad	R987144874	.868 .858	.832 .822	3600 lb 4500 lb	0.812	5050 lb	2.97	8.75	6.50	0.31	8.125	0.266	2.437	--	0.25	#25-20 2.00" long

*CAUTION - Do not use spring pad if the working load on the spring-mounted bearing exceeds installed spring load indicated above.

** Use only screw length J for fastening bearing to spring pad. Do not use longer screws.

Tycho-Gibb/Options

Tycho-Gibb for static preload and height adjustment



Assembly Part #	Old Part #	Description	Bearing Size	Old Bearing Size	A ¹	A ²	B	C	D	E	F	G	H	J	K	L	M	N	P
R987144821	42100	#6 TYCHO GIBB	R987144824	21100	0.6467	0.6329	0.0138	0.276	3.068	2.441	1.000	0.812	0.990	4-40	0.65	1.071	8-32	4-40	0.812
R987144861	42150	#9 TYCHO GIBB	R987144863	21150	1.0030	0.9873	0.0157	0.315	4.410	3.540	1.500	1.279	1.480	8-32	0.90	1.484	10-32	10-32	1.219
R987148889	42200	#12 TYCHO GIBB	R987144726	21200	1.1998	1.1841	0.0157	0.315	5.550	4.528	2.000	1.625	1.980	10-32	1.10	1.951	5/16-18	1/4-28	1.625

Matched height bearings

Matched height Tychoway bearings are for use in height dimension critical applications. The term *matched* indicates the tightened tolerance of height dimension A in comparison with standard bearings. All other dimensions remain standard. Part numbers for matched height Inch Series bearings are listed in the table.

Matched Height Bearings			
Buna Band Part #	Buna Band Old Part #	Description	Height "A" in inches
R987144782	21058	#4 Tychoway Match Bearing	0.562425 0.562375
R987144819	21108	#6 Tychoway Match Bearing	0.749925 0.749875
R987144867	21158	#9 Tychoway Match Bearing	1.124925 1.124875
R987144712	21208	#12 Tychoway Match Bearing	1.499925 1.499875
R987144745	21258	#18 Tychoway Match Bearing	2.249950 2.249850
R987144766	21308	#24 Tychoway Match Bearing	2.999950 2.999850

Metal clip bearings

These bearings use metal clips for roller retention and are suited for high temperature applications. Metal clip bearings are dimensionally identical to standard Tychoway bearings.

See page 7 for specifications and part numbers.

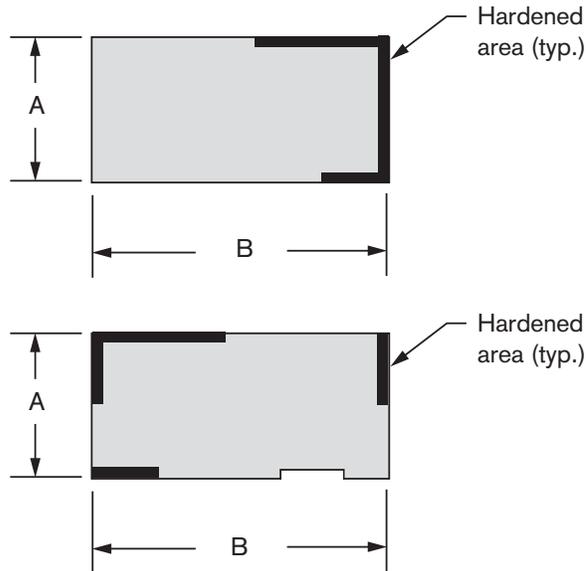
Metal Clip Part #	Metal Clip Old Part #	Description	Height "A" in inches
R987144778	21088	#4 Tychoway	0.562425 0.562375
R987144819	21138	#6 Tychoway	0.749925 0.749875
R987144847	21188	#9 Tychoway	1.124925 1.124875
R987144719	21238	#12 Tychoway	1.499925 1.499875
R987144741	21288	#18 Tychoway	2.249950 2.249850

Recommended Rail Geometry

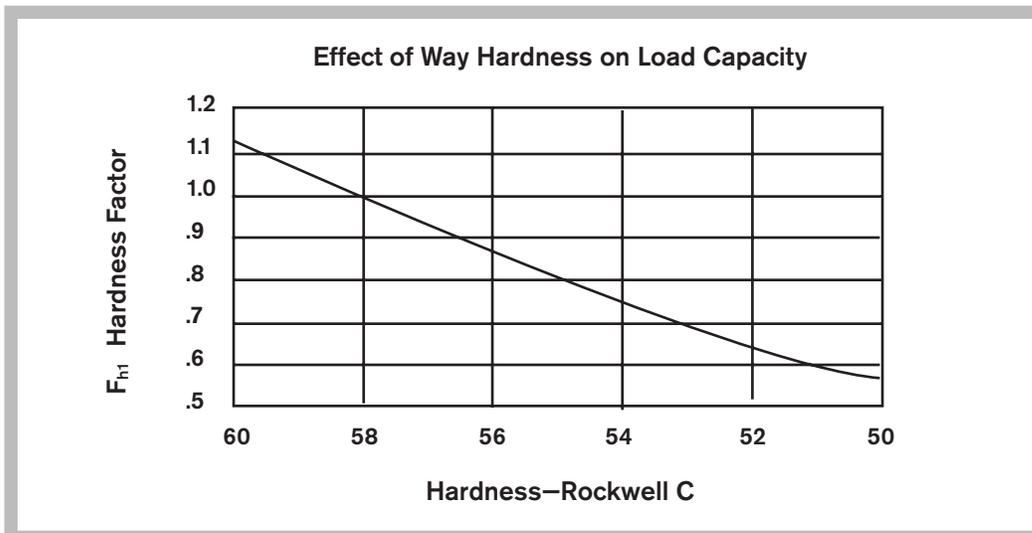
The rail surface on which the Tychoway linear roller bearings operate is one of the races of the bearing system. Rexroth recommends steel rails hardened to 58 Rockwell C minimum. The graph below indicates the effect of rail hardness on the load capacity of Tychoway linear roller bearings.

Hardened and ground rails for assembly should be made with the working surface hardened to a minimum depth of .125".

Typical shapes and sizes of rails are shown at right. Special rails with key-ways and shoulders for more secure mounting are also common. Please contact your way manufacturer to ensure that the specifications match these recommendations.



Typical sizes, inches	
A	B
1.000	2.000
1.375	2.750
1.500	3.500
1.500	4.500
2.000	4.000
2.000	5.000
2.500	4.500
2.500	6.500
3.000	6.000



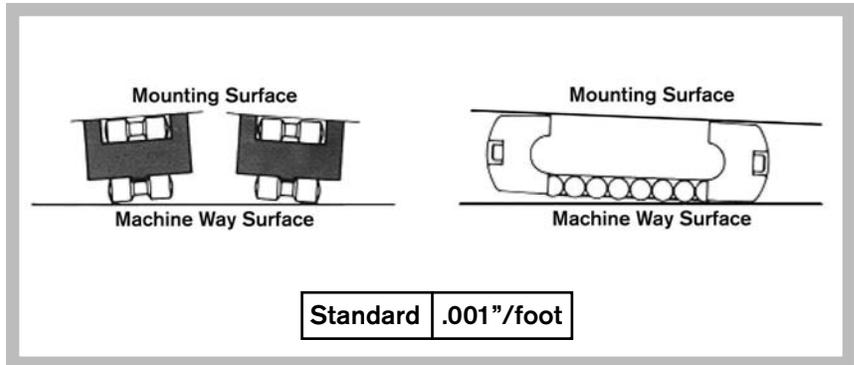
Installation

Mounting accuracy

In order to attain the rated load capacity and life for Tychoway linear roller bearings, the following mounting accuracies and alignments must be maintained in installation.

Parallelism between mounting surfaces

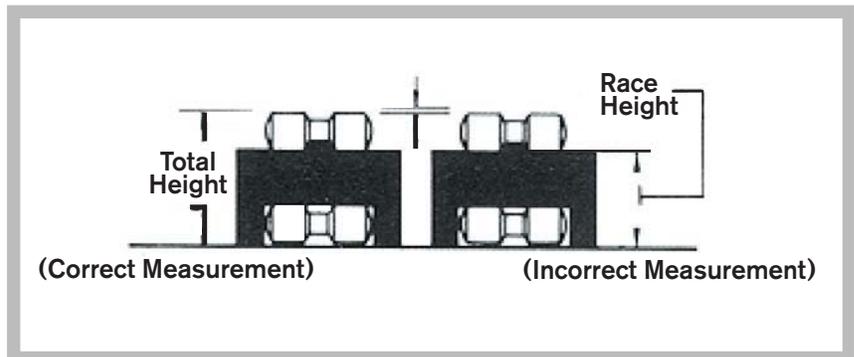
To assure uniform loading of the bearings on the machine rail, the surfaces to which the bearings will be mounted should be parallel to the rail surface within .001" per foot.



Uniformity of mounting height

Bearing-to-bearing height measurement cannot be taken from the bearing race surface. The total height of each individual bearing is the sum of the race height plus the roller diameter. Measurement must take the total height of the bearing into consideration.

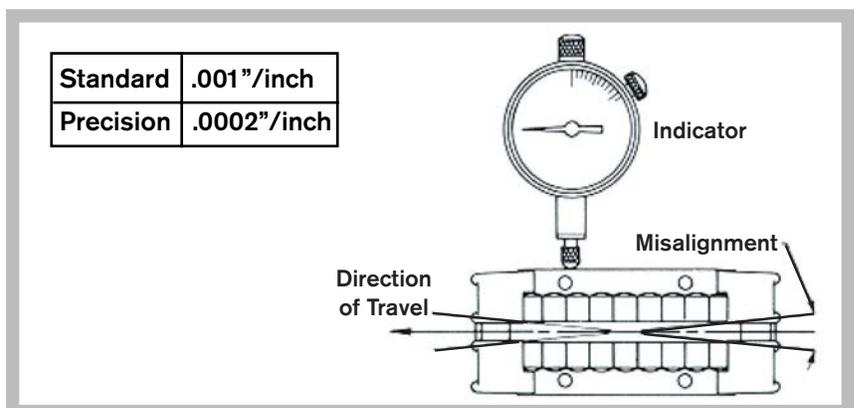
For standard bearings, the tolerance for total bearing height (race height plus roller diameter) is held to within .0003". Matched height bearing with a height tolerance of + 0, - .000050" are available for applications where accurate height measurements are not easily attainable.



NOTE: Design of the adjacent machine structures should allow for these tolerances at the bearing.

Alignment in the direction of travel

For most applications, this alignment should be within .001"/inch measured along the side of the bearing race. However, where machine slide positioning accuracy of .0005" or less is required, a tolerance of .0002"/inch is necessary.



Preload

Rexroth linear roller bearings allow for straightforward installation. Mounted in preloaded pairs, they control the alignment and movement of machine elements within extremely close tolerances.

The main reasons for preloading are to eliminate looseness and lift-off under loads and to increase the stiffness of the system. Preload has the same effect on bearing life as a working load and therefore should be minimized. Recommended preload for most machine tool applications is 15% of the bearing's dynamic capacity.

Desired preload is usually established by determining the required bearing deflection. This requires that components be dimensioned so that the bearing will be deflected the desired amount at final assembly.

Preload can also be induced with devices such as the Tycho-Gibb or the Tychoway spring pad. These and other methods are detailed on the following page.

With preload constructions, the designer should take into consideration the sequence of final assembly. Rexroth does not recommend premounting the bearings and the forcing the assembly onto the machine rails, as this may damage the bearings. A design which allows the machine components to be bolted together will usually simplify the assembly procedure.

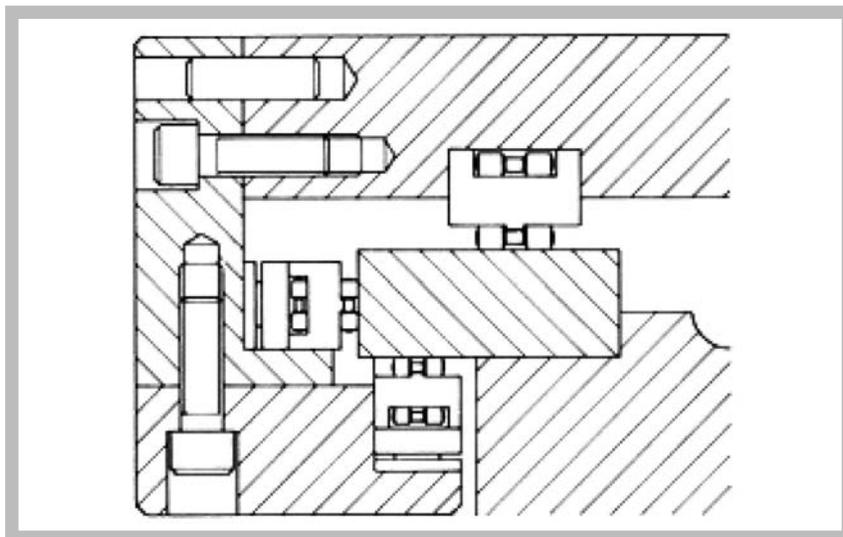
Preload can be checked by measuring the force required to move the well-aligned and preloaded assembly. If the total weight and preloads on the bearings are known, the theoretical force required to move the table can be calculated. An approximate co-efficient of friction for a Tychoway bearing system, including wipers, is .005.

As an example of calculating friction, consider a machine with twelve Tychoway 21050 bearings and a slide table weight of 2000 pounds. Stiffness per bearing is 3.2 million pounds per inch, and dynamic capacity is 2,220 pounds.

To induce a 15% preload each bearing must be deflected approximately .0001 inches. Deflection is calculated by first multiplying the bearing dynamic capacity by the preload percentage to obtain preload force. Next, the stiffness rating is used to determine the amount of deflection required to induce this preload force.

In this example, a dynamic capacity of 2,220 pounds multiplied by a .15 preload results in a required preload force of 333 pounds. The stated bearing stiffness rating indicates each bearing must be deflected .0001 inches, perpendicular to the mounting surface.

Total system friction is the sum of the preload induced friction. With a .005 coefficient of friction, the bearings combine to generate 20 pounds of friction force. The 2000 pound table weight generates 10 pounds friction force. Thus, total calculated friction force for this system, without a working load applied, is 30 pounds.

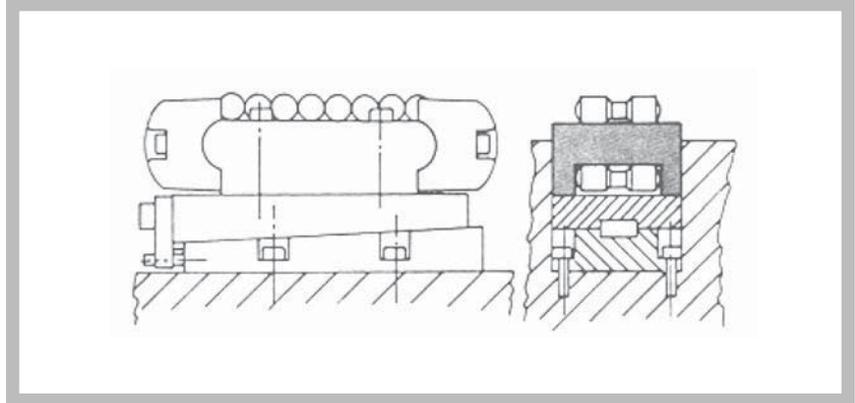


Preload Methods

The method used for preloading Tychoway® Roller Bearings is a function of the overall machine design. Mounting design is flexible to the extent that the bearing contacts the rail within Rexroth's stated limits of accuracy and parallelism (see page 12). Some common methods of preloading are shown below.

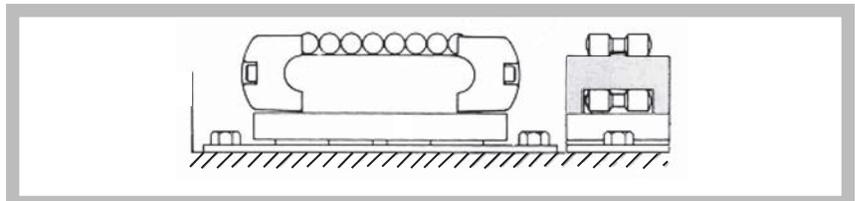
With a Tycho-Gibb

The Tycho-Gibb may be used for solid preload or height adjustment of Rexroth Tychoway bearings. It consists of two precision-ground wedges guided by a central key with a fixed plate at one end to support the adjusting and locking screws. A lubrication port in the Tycho-Gibb allows lubrication of the rolling elements of the bearing through the return zone. The Tycho-Gibb offers the following advantages over other mounting techniques: solid preload adjustability, height compensation and adjustment for resurfacing of rails.



With a Spring Pad

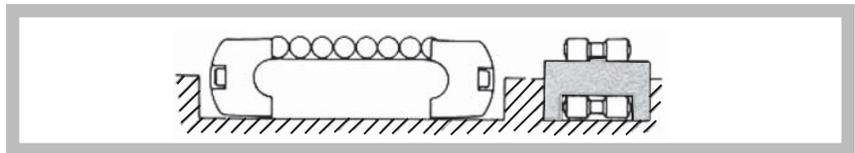
The Spring Pad is self-compensating and does not require the precision demanded by fixed mountings. It is useful in applications where the imposed load does not exceed the spring preload and offers some flexibility in the pitch and roll rotation axes.



NOTE: The Tycho-Gibb and Spring Pad are designed for use with inch series Rexroth Tychoway bearings. Each product offers the flexibility of preload and machining techniques over the following conventional methods.

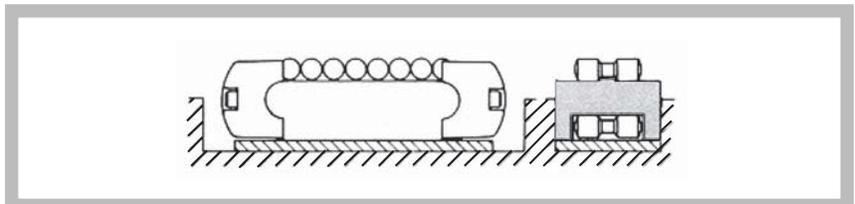
Directly to Machine

This method requires high precision machining. Cumulative tolerance errors must be considered.



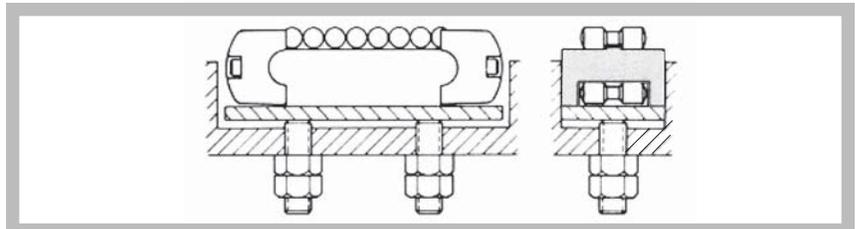
With a Shim Plate

This method permits accurate dimensional control through final machining of the shim plate which should be mild to medium carbon steel with a compressive yield strength of at least 50,000 psi and be at least 1/8" thick.



With an Adjustable Pad

This method eliminates the need for accurate machining of the mounting surfaces. Final adjustments may be quite sensitive, but can provide one or more degrees of freedom for alignment.



Life Calculations

Life

Load capacity ratings for Rexroth Tychoway® Linear Roller Bearings are given in the Specifications Section. With these ratings and the use of the service life calculations, machine designers can select the required bearings.

Bearing Life Factors

The service life equations consider load, rail hardness and temperature factors. L10 life is the 90% probability life based on the rated dynamic capacity.

Dynamic Load Capacity (C)*

When the same model of standard Tychoway bearings with Buna band are operated individually under identical load and operating conditions, and 90% of them can run for 30 million inches with material damage by rolling fatigue, the total applied bearing load is the rated Dynamic Load Capacity. The capacity is based on 10 million inches travel for the Metal Clip and Metric Series.

Rail Hardness Factor (F_h)

Service life for Tychoway bearings is affected by rail hardness. Load capacity ratings for the bearings assume a rail hardness of 58 Rockwell C, minimum depth .0125". Though not recommended, use of rails hardened to a lesser degree decreases bearing service life. A capacity correction chart in the "Rails" section provides the Rail Hardness Factor (F_h) for dynamic and static load capacities.

Temperature Factor (F_t)

Bearing capacity of materials changes inversely with temperature. The graph gives the percentage of bearing capacity retained at various temperatures compared to a bearing having a minimum hardness of 60 Rockwell C at room temperature. The Temperature Factor F_t is used in the service life calculation.

For Buna Banded and Tycho II bearings

$$L_{10} = \left(\frac{C \cdot F_h \cdot F_t}{P_c} \right)^{\frac{10}{3}} \cdot 30 \cdot 10^6$$

For Metal clip and Metric bearings

$$L_{10} = \left(\frac{C \cdot F_h \cdot F_t}{P_c} \right)^{\frac{10}{3}} \cdot 10 \cdot 10^6$$

L10 = Basic rating life in inches of travel

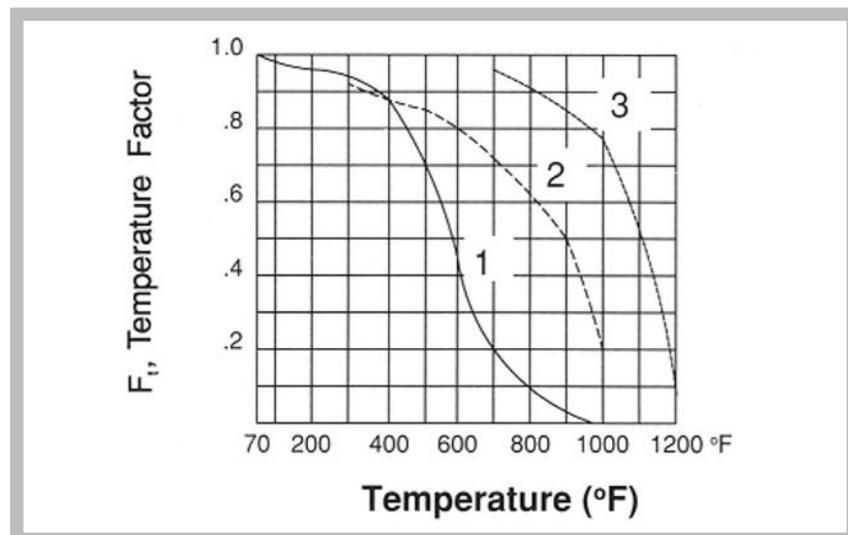
C = Dynamic load capacity, lbf (kN)

P_c = Calculated normal load, lbf (kN)

F_t = Temperature factor

F_h = Rail hardness factor

These formulae assume normal operating conditions and an evenly applied load normal to the bearing.



Life Calculations

Static Load Capacity (C_o)*

Static Load capacity for Rexroth Tychoway® Bearings is given in the Specifications Section. These ratings are defined as the load at which a permanent deformation of the bearing races takes place, equal to 1/10,000 of the roller diameter. If vibrations or impacts are present when the bearings are static, the Static Impact and Vibration Factor (S_1) should be used to adjust the Static Load Capacity (C_o).

$$C_o' = C_o \cdot F_s$$

C_o' = Adjusted Static Load Capacity

C_o = Basic Static Load Capacity

F_s = Static Load Factor

Static Impact and Vibration Factor (F_s)

The Static Load capacity of Rexroth Tychoway® Bearings may need to be adjusted according to conditions. In application where impacts or vibrations are present, the static Load Capacity should be multiplied by the Static Load Factor (F_s) to obtain the Adjusted Static Load Capacity (C_o'). The equation shown on the right should be used to determine the adjusted static capacity for your application.

Static Impact and Vibration Factors

Static Conditions	Static Factor F_s
No vibration or impact	0.78 - 1.00
Slight to moderate vibration	0.56 - 0.78
Heavy vibration or impact	0.43 - 0.56

Note on Bearing Life

The service life equations provide a good approximation of bearing life. However, bearing life is difficult to predict due to factors other than those considered in the equation, such as those listed. Rexroth recommendations for these factors are discussed in other sections of this catalog. If additional information is required, please contact us.

- Lubrication of the rolling elements
- Contamination of the rolling elements
- High speeds and accelerations
- Stiffness of other machine components
- Accuracy of machine ways

To calculate bearing service life for a model 21100 standard bearing, use the 30 million inch service life equation for Buna band and Tych II bearings. Assume a Temperature Factor and Rail Hardness Factor of 1.0 (100%).

$$L_{10} = \left(\frac{4240 \cdot 1.0 \cdot 1.0}{2100} \right)^{\frac{10}{3}} \cdot 30 \cdot 10^6$$

$$L_{10} = 310 \cdot 10^6 \text{ inches}$$

Let: Load $P_C = 2100$ lbs.

Dynamic Capacity of 21100 brg. = 4240 lbs.

NOTE: * Static and dynamic capacities and life calculations are based on standards established by the American National Standards Institute (ANSI) and Anti-Friction Manufacturers' Association (ABMA).

Operation Data

Lubrication

Rexroth Tychoway® Bearings generally require only a minimum amount of lubrication unless speeds are relatively high and operation continuous. The lubricant must be kept perfectly clean, as a very small amount of contamination can seriously damage the bearings or rails.

Standard lubrication is light machine oil with a viscosity rating of 135 to 165 SSU at 100°F. Each bearing should be supplied 1.0 cc of oil per hour under normal operating conditions. Rexroth recommends automatic lubrication systems for most applications.

The lubrication also helps prevent the bearings from corroding. If machine operation is infrequent, the bearing assembly should still be adequately lubricated to prevent corrosion. It is highly recommended that all coolants that come into contact with the bearings contain rust inhibitors. Coolants should be checked to assure that they do not attack the bearing wiper systems as the contaminants introduced may cause bearing failure.

Rexroth's lubrication recommendations for normal operating conditions are defined as:

- Bearing loads not exceeding their rated dynamic capacities
- Linear speed not in excess of 1200 inches per minute; linear accelerations not in excess of 10g
- Bearings properly protected from contamination
- Operating temperatures not in excess of 175°F.

Consult Rexroth if unusual loading or environmental conditions are anticipated.

Covers and Wipers

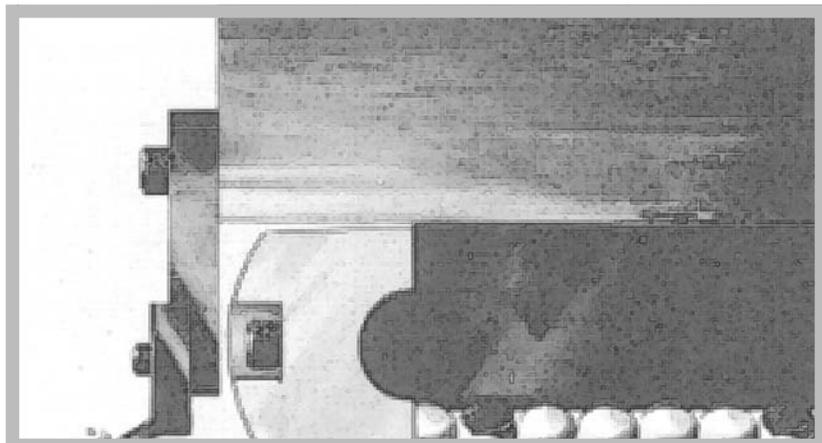
In all bearing applications, the rolling area must be protected against contamination. Therefore, provisions should be made for keeping the bearing assembly perfectly clean or serious damage can occur.

Common contaminants include material chips from machining, coolants carrying grinding dust and airborne debris. Dirt, particularly of a hard and abrasive nature, can cause serious damage to rolling element bearings.

Standard rail wipers may suffice for keeping contamination out of the bearing's roller path, however, bellows or metal covers are recommended by Rexroth for more positive protection.

Operating Temperatures

Standard Tychoway bearings with the Buna Stabilizer Band and Metric Series Bearings should be operated in temperatures less than 175°F. For temperatures greater than this, the Inch Series Metal Clip model is recommended for its all-steel construction. See the Life Calculation section for the effects of elevated temperatures on bearing capacity and life.



Test Data

Deflection Test

Stiffness per bearing ratings are given in the Specifications Section and are used to calculate machine deflection and preload forces. Tychoway® stiffness ratings were determined through deflection tests and represent an average over a range of loads.

The results shown here were conducted by an independent agency, Robert W. Hunt Co. Testing Laboratory. Deflection test results for the 21250 Buna Stabilizer Band bearing are shown as an example.

Deflection of 21250 Bearing	
Load in lbs.	Deflection in inches
10,000	0.00073
20,000	0.00173
30,000	0.00204
40,000	0.00270
50,000	0.00332
60,000	0.00393
70,000	0.00457

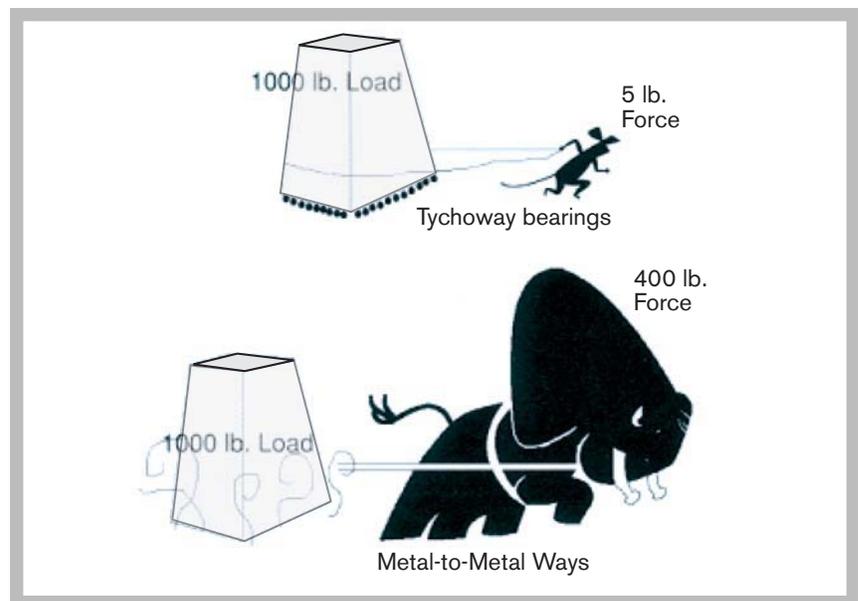
Deflection Test

Tychoway® Linear Roller Bearings operate with a much lower coefficient of friction than traditional metal-to-metal ways. This allows the use of lighter duty drive mechanisms, such as motors and ballscrews. Thus, machines based on Tychoway bearings can be more economical and have a longer service life.

Tests of Tychoway bearings at different preloads indicate that the coefficient of friction varies with load. A realistic coefficient of applied friction for a machine system, including wipers, would be approximately .005.

The reverse pattern of coefficients for the two types of bearings is noteworthy. The higher coefficient of the Buna banded bearing at light loads is due to some interaction of the rollers from the band tension and some drag friction. As the load increases, the rollers are more effectively separated when they enter the load zone and rolling action takes place.

Excessive misalignment of offset loading can increase the coefficient. This occurs primarily on the metal clip bearing though mounting inaccuracy of any bearing creates higher friction.



Starting and Operating Coefficient		
Bearing Type	% of Rated Load	Coefficient of Friction
Metal Clip	15%	0.0011 - 0.0025
	45%	0.0018 - 0.0031
	75%	0.0023 - 0.0037
Buna Band	15%	0.0040 - 0.0044
	45%	0.0012 - 0.0017
	75%	0.0011 - 0.0013

Notes

Inquiry/Order Form

Part #	Description	Version	Qty
R987144778	#4 TYCHOWAY MATCHED CLIP BEARING	21088	
R987144779	#4 TYCHOWAY BEARING	21050	
R987144780	#4 TYCHOWAY CLIP BEARING	21080	
R987144795	#6 TYCHOWAY CLIP BEARING	21130	
R987144819	#6 TYCHOWAY MATCHED CLIP BEARING	21138	
R987144824	#6 TYCHOWAY BEARING	21100	
R987144825	#6 TYCHOWAY MATCHED BEARING	21108	
R987144826	#6 TYCHOWAY BEARING W/LUBE OPENING	21100-LB	
R987144847	#9 TYCHOWAY MATCHED CLIP BEARING	21188	
R987144863	#9 TYCHOWAY BEARING	21150	
R987144865	#9 TYCHOWAY BEARING w/LUBE OPENING	21150-LB	
R987144866	#9 TYCHOWAY CLIP BEARING	21180	
R987144867	#9 TYCHOWAY MATCHED BEARING	21158	
R987144870	#9 TYCHOWAY BEARING W/STEEL END CAPS	21190	
R987144712	#12 TYCHOWAY MATCHED BEARING	21208	
R987144719	#12 TYCHOWAY MATCHED CLIP BEARING	21238	
R987144720	#12 TYCHOWAY CLIP BEARING	21230	
R987144726	#12 TYCHOWAY BEARING	21200	
R987144731	#18 TYCHO II MATCHED BEARING	31258	
R987144874	#18 TYCHOWAY BEARING	21250	
R987144741	#18 TYCHOWAY MATCHED CLIP BEARING	21288	
R987144745	#18 TYCHOWAY MATCHED BEARING	21258	
R987144746	#18 TYCHOWAY CLIP BEARING	21280	
R987144759	#24 TYCHOWAY CLIP BEARING	21330	
R987144765	#24 TYCHOWAY BEARING	21300	
R987144704	#24 TYCHO II BEARING	31300	
R987144817	#6 SUPERWAY BEARING	21100S	
R987144818	#6 TURCITE BEARING (SUPERWAY)	31110-TB-01	
R987144859	#9 SUPERWAY TRUCK BEARING	21150S	
R987144853	#9 SPRING PAD	21915	

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Quantity Order of: _____ pcs, _____ per month, _____ per year, per order, or _____
Comments: _____

From

Company: _____

Name: _____

Address: _____

Department: _____

Telephone: _____

Telefax: _____

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