Structural

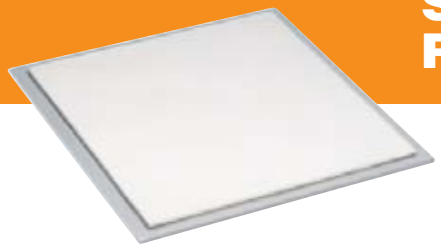
Lubron® TR

Self-Lubricating PTFE Resin Slide Bearings

Lubron Bearing Systems

Bearings to move the world.

Lubron TR
Self-Lubricating PTFE Resin Slide Bearings

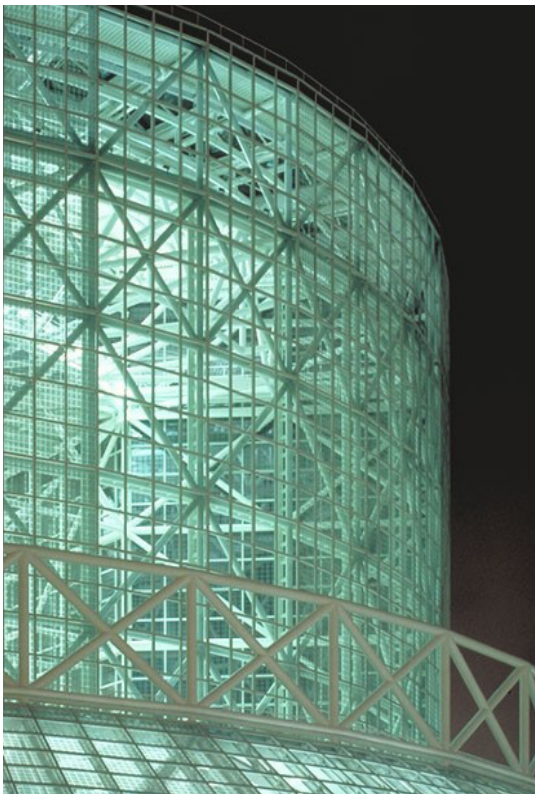


LUBRON® TR slide bearings offer a simple and economic solution for most moderate load bearing requirements. LUBRON TR slide bearings are self-lubricating and maintenance-free, and are designed to provide low coefficient of friction to accommodate thermal, mechanical and seismic movement.

LUBRON TR slide bearing assemblies consist of an upper and a lower bearing component, and are available in sets of PTFE/PTFE or PTFE/SS.

PTFE/PTFE Slide Bearings - upper and lower PTFE bearing components capable of sliding movement unrestricted in any single plane direction. Both PTFE bearing components consist of a PTFE resin sheet bonded to either carbon steel, stainless steel, elastomer or fabric pads.

PTFE/SS Slide Bearings - upper stainless steel component and lower PTFE bearing component capable of sliding movement unrestricted in any single plane direction. The upper sole plate component typically consists of a 1/8" (3.2mm) thick ASTM A240 Type 304 stainless steel sheet full perimeter welded to carbon steel. The sole plate sliding surface shall be polished to a maximum 10 microinch (0.25 micrometer) finish. The lower PTFE bearing component consist of a PTFE resin sheet permanently bonded to either carbon steel, stainless steel, elastomer or fabric pads. LUBRON TR PTFE bearing components may be procured separately, although we strongly recommend purchasing both the upper and lower components to assure optimum performance and reliability.



LUBRON TR PTFE slide bearings have been performing flawlessly in a variety of rigorous structural applications for more than 30 years. LUBRON TR slide bearings are designed to accommodate sliding movement in a single plane, and are recommended for applications subject to limited angular misalignment. LUBRON TR slide bearings provide low coefficient of friction and moderate load capability, and are fabricated, tested and inspected in accordance with the latest ASTM, AASHTO and State DOT standards, plans and specifications.

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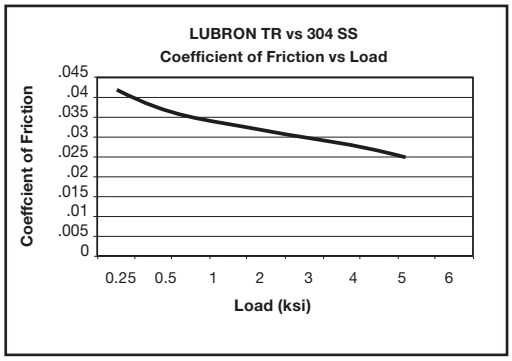
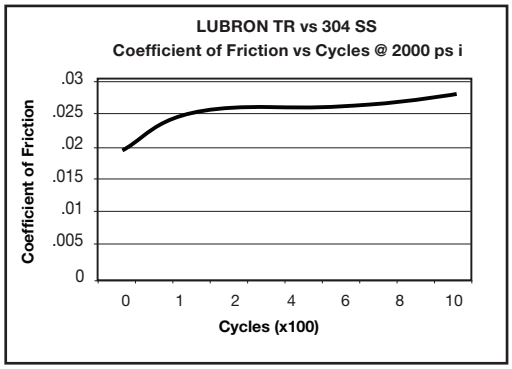
LOAD CAPACITY

LUBRON TR slide bearings are designed to accommodate bearing loads up to 2 ksi (13.8 MPa). For higher loads, the addition of 15% or 25% glass fibers greatly improves the mechanical properties of PTFE, resulting in higher compressive strength, greater dimensional stability and improved wear resistance. Stainless steel sole plates are also recommended for higher load applications.



COEFFICIENT OF FRICTION

LUBRON TR slide bearings typically exhibit coefficients of friction of less than 6.0%, depending on the bearing load, temperature, velocity, finish and hardness of the mating surface. The static coefficient of friction is only slightly higher than the dynamic value, minimizing stick-slip.



SHEAR RESISTANCE

LUBRON TR PTFE resin sheet is permanently bonded to the substrate surface, and will resist a minimum 25% of the allowable vertical load in horizontal shear between the adhering elements as tested in accordance with Federal Specification MMM-A-175 Method 1033.

THERMAL CAPABILITIES

LUBRON TR bearings have excellent thermal stability and are recommended for continuous operation from -360ºF (-218ºC) to 500ºF (260ºC). Coefficient of friction generally decreases slightly with an increase in surface temperature. Load capacity will decrease with an increase in temperature. For elevated temperatures, the maximum allowable bearing pressure must be considered when sizing the slide bearing components.

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CHEMICAL RESISTANCE

PTFE sliding surfaces are essentially chemically inert and virtually unaffected by solvents, fuels and reagents.

PHYSICAL PROPERTIES

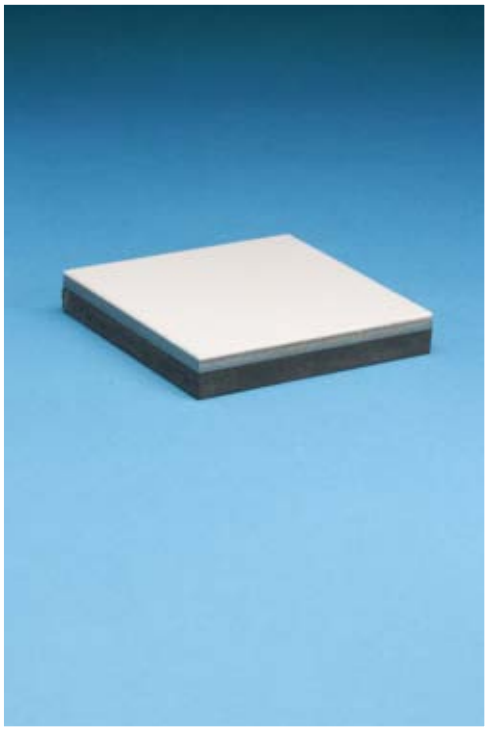
The physical property limits for PTFE resin sheet shall satisfy the following AASHTO requirements at 68°F (20°C):

Properties	Unfilled PTFE		15% Glass-Filled PTFE		25% Glass-Filled PTFE	
	ASTM	Value	ASTM	Value	ASTM	Value
Tensile Strength (psi):	2800	D1457	2000	D1457	2000	D1457
Elongation (%):	200	D1457	150	D1457	150	D1457
Specific Gravity:	2.16	D792	2.20	D792	2.20	D792
Melting Point (°F):	623	D1457	621	D1457	621	D1457
Static C.O.F. @500 psi:	0.08		0.24		0.24	
1000 psi:	0.07		0.17		0.17	
2000 psi:	0.05		0.09		0.09	
3000 psi:			0.06		0.06	

DESIGN PARAMETERS

LUBRON TR slide bearings shall be designed in accordance with the following requirements unless otherwise specified by the Project Plans, Specifications and Special Provisions:

- Slide bearings shall accommodate the maximum total vertical load required unless otherwise specified. Maximum vertical load is assumed to be the total dead and live loads.
- The projected area of the smallest PTFE surface shall be designed for a working stress under full vertical load unless otherwise specified.
- Slide bearings shall be designed to resist the maximum horizontal load, or at least 10% of the maximum vertical load, unless otherwise specified.
- Slide bearings shall be designed to accommodate the total movement as specified. Sole plates shall completely cover the PTFE bearing component in all longitudinal and lateral operating positions with a minimum 1/2” (12.7mm) distance from the edge of the sole plate sliding surface to the edge of the bearing plate for every direction of movement.



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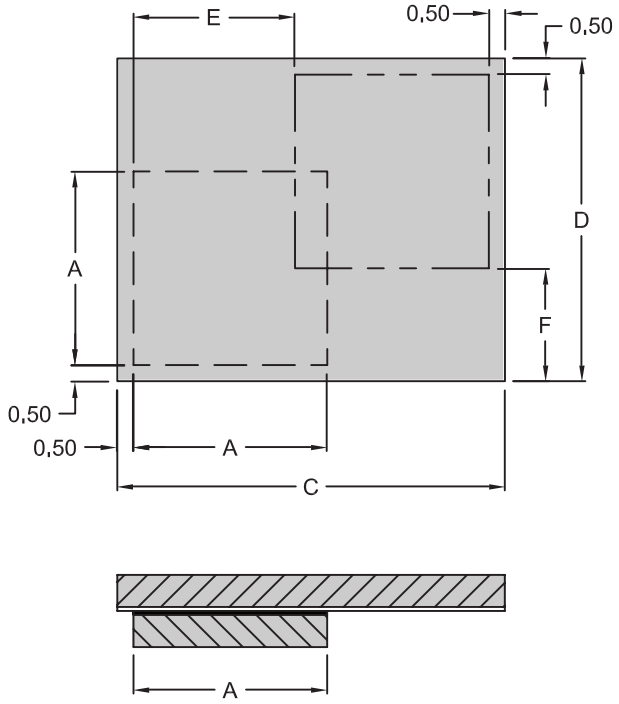
SIZING GUIDE

To accommodate maximum horizontal movement, the required upper bearing plate or stainless steel sole plate size for standard bearing plate sizes can be determined using the following table. Using the appropriate bearing design load and maximum vertical load, select the proper lower bearing plate size and corresponding upper plate or sole plate size. The maximum bearing movement, dimensions “E” and “F”, must be added to dimensions “C” and “D” respectively.



SIZE CHART (INCHES)

BEARING DESIGN LOAD (ksi)				LOWER PLATE	UPPER PLATE	
0.5	1.0	2.0	3.0	A	C	D
MAXIMUM VERTICAL LOAD (kip)				(inches)	(inches)	(inches)
4.5	9	18	27	3	4.0 + E	4.0 + F
8.0	16	32	48	4	5.0 + E	5.0 + F
12.5	25	50	75	5	6.0 + E	6.0 + F
18.0	36	72	108	6	7.0 + E	7.0 + F
24.5	49	98	147	7	8.0 + E	8.0 + F
32.0	64	128	192	8	9.0 + E	9.0 + F
40.5	81	162	243	9	10.0 + E	10.0 + F
50.0	100	200	300	10	11.0 + E	11.0 + F
60.5	121	242	363	11	12.0 + E	12.0 + F
72.0	144	288	432	12	13.0 + E	13.0 + F
84.5	169	338	507	13	14.0 + E	14.0 + F
98.0	196	392	588	14	15.0 + E	15.0 + F
112.5	225	450	675	15	16.0 + E	16.0 + F
128.0	256	512	768	16	17.0 + E	17.0 + F
144.5	287	578	867	17	18.0 + E	18.0 + F
162.0	324	648	972	18	19.0 + E	19.0 + F
180.5	361	722	1083	19	20.0 + E	20.0 + F
200.0	400	800	1200	20	21.0 + E	21.0 + F

SIZE CHART (MM)

BEARING DESIGN LOAD (MPa)				LOWER PLATE	UPPER PLATE	
3.5	7.0	14.0	21.0	A	C	D
MAXIMUM VERTICAL LOAD (kN)				(mm)	(mm)	(mm)
20	39	79	118	75	100 + E	100 + F
35	70	140	210	100	125 + E	125 + F
55	109	219	328	125	150 + E	150 + F
79	158	315	473	150	175 + E	175 + F
107	214	429	643	175	200 + E	200 + F
140	280	560	840	200	225 + E	225 + F
177	354	709	1063	225	250 + E	250 + F
219	438	875	1313	250	275 + E	275 + F
265	529	1059	1588	275	300 + E	300 + F
315	630	1260	1890	300	325 + E	325 + F
370	739	1479	2218	325	350 + E	350 + F
429	858	1715	2573	350	375 + E	375 + F
492	984	1969	2953	375	400 + E	400 + F
560	1120	2240	3360	400	425 + E	425 + F
632	1264	2529	3793	425	450 + E	450 + F
709	1418	2835	4253	450	475 + E	475 + F
790	1579	3159	4738	475	500 + E	500 + F
875	1750	3500	5250	500	525 + E	525 + F

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MATERIALS

All materials used in the manufacture of LUBRON TR slide bearings shall meet the following requirements unless otherwise specified in the Project Plans, Specifications and Special Provisions:

- Structural steel plate shall conform to the requirements of ASTM A36, ASTM A709 Grade 36 (250), ASTM A709 Grade 50 (345), ASTM A572 Grade 50 (345), ASTM A709 Grade 50W (345W) or ASTM A588 Grade A.
- Stainless steel sheet shall conform to the requirements of ASTM A240 Type 304 or Type 316 with a mirror finish not exceeding 10 microinches (0.25 micrometers).
- PTFE (polytetrafluoroethylene) surfaces shall consist of either unfilled PTFE, 15% or 25% glass-filled PTFE resin made from 100% virgin (not reprocessed) PTFE meeting the requirements of ASTM Designation D4894 (superceding ASTM Designation D1457). The PTFE resin sheet shall have a minimum thickness of 1/16” (1.6 mm) and a maximum thickness of 1/8” (3.2 mm).

BONDING

LUBRON TR slide bearings are bonded using high strength, heat-resistant, non-corroding, insoluble epoxy resin adhesives applied under factory controlled heat and pressure. Backing plates shall be dry abrasive blasted prior to bonding in accordance with the requirements of SSPC-SP10 “Near-White Blast Cleaning”. The PTFE bearing sliding surfaces shall be smooth and uniform in appearance, and shall show no evidence of any proturberance, delamination of other imperfections.

WELDING

Shop welding of stainless steel sole plate components shall be performed in accordance with the requirements of ANSI/AASHTO/AWS D1.1, AWS D1.5 or AWS D1.6 unless otherwise specified.

CORROSION PROTECTION

Corrosion protection including painting and metallic coating of all exposed carbon steel surfaces shall be performed in accordance with Project Plans, Specifications and Special Provisions.

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INSTALLATION

Recommended installation instructions are included with every shipment of LUBRON TR slide bearings. The larger sole plate or slide bearing component should be installed in the upper position and fully cover the smaller slide bearing component in every direction of movement. Welding of the slide bearing components shall be permitted provided temperatures of the bonded area do not exceed 300ºF (150ºC). LUBRON TR slide bearings can be stitch welded along the perimeter of the backing plate. If full seam welding is desired, the slide bearing plates are available with the PTFE recessed 1/4” from the edges of the backing plate.

LUBRON TR slide bearings can be furnished with drilled circular or slotted holes to accommodate bolting through the entire assembly. For cast-in-place concrete applications, LUBRON TR slide bearings can be supplied with anchor studs welded to the backing plate. PTFE sliding surfaces should be protected against damage during any welding, grit blasting and painting. The PTFE sliding surfaces must be maintained clean and free of dirt, grit and other contaminates which could effect the performance or service life of the bearing assembly.

SUPPLEMENTAL LUBRICATION

For lower coefficient of friction applications, LUBRON TR slide bearing surfaces can be furnished with dimpled recesses to accommodate supplementary grease lubrication. Silicon grease conforming to Military Specification MIL-S-8660 is generally recommended for most structural applications.

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TESTING

Slide bearing assemblies shall be tested if required in full compliance with the Project Plans, Specifications and Special Provisions. Testing shall be performed in-house or by an independent testing laboratory subject to the approval of the Project Engineer. Bearings which do not fully satisfy all the testing and inspection requirements shall be replaced or repaired to the satisfaction of the Project Engineer.

QUALITY ASSURANCE

Quality Assurance requirements for the manufacture and inspection of slide bearing assemblies shall be in strict accordance with the requirements ISO 9002. Every phase of manufacture shall be monitored by Quality Control personnel to ensure that all materials and workmanship meet or exceed the requirements of the Project Plans, Specifications and Special Provisions.

ENGINEERING SERVICES

We offer a variety of engineering services from the selection of bearing materials to in-house testing of bearing assemblies to simulate load, movement, velocity, temperature and other environmental conditions present during the actual operation of LUBRON TR bearings. Bearing design, AutoCAD® drawing preparation, testing, consulting and on-site engineering services are available upon request.

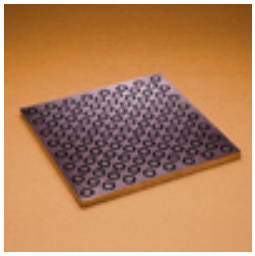
GUARANTEED PERFORMANCE

Our leadership and reputation for service and product knowledge has been achieved through a strong commitment to total customer satisfaction. Every LUBRON TR bearing is guaranteed to perform reliably and trouble-free, and every effort will be made to accommodate our customer's delivery requirements within the shortest time possible.

LUBRON Self-Lubricating Bearings for Structural Applications

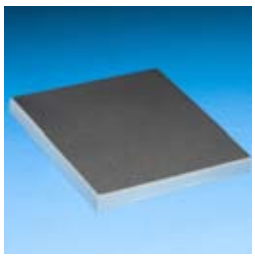
LUBRON SL

LUBRON SL bearings are widely used in structural applicatons for loads up to 8,000 psi. Available in a variety of high strength bronze alloys, LUBRON SL bearings are permanently embedded with solid lubricants contained in trepanned or circular recesses.



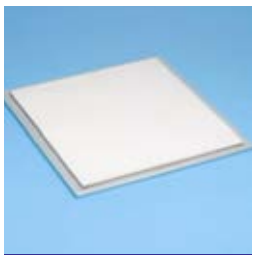
LUBRON TF

LUBRON TF woven PTFE fiber bearings are designed to provide the lowest possible coefficient of friction for high load structural applications. Interwoven with secondary glass fibers and bonded under pressure and temperature to carbon steel or stainless steel substrates, LUBRON TF bearings are capable of static loads up to 60,000 psi.



LUBRON TR

LUBRON TR resin slide bearings provide an economic alternative for low friction applications with loads up 2,000 psi. LUBRON TR slide bearings consist of PTFE resin sheets bonded to either a combination of carbon steel, stainless steel, elastomer, or fabric pads. For higher loads, LUBRON TR bearings are also available reinforced with the addition of up to 25% glass fibers.



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