



CON-SERV

BUILDING  AMERICA

SERVICE • QUALITY • ECONOMY

**YOUR ALL-AMERICAN
STRUCTURAL
BEARING
SOLUTION**

STRUCTURAL SUPPORT BEARING
SYSTEMS FOR ALL INDUSTRIES

WHERE FIT AND FINISH MATTER...

Entrepreneur Richard Drummond founded CON-SERV in 1978, envisioning a dependable American enterprise that provides quality custom structural engineering solutions for a wide range of heavy construction and architectural applications. Operating from two convenient domestic locations – Georgetown, SC, and Brunswick, OH – experienced CON-SERV technicians continue to manufacture and supply custom support slide and High-Load Multi-Rotational (HLMR) bearing systems to builders in the bridge and heavy construction industries all over the world.

At CON-SERV, fit and finish matter. Using state of the art technology, experienced CON-SERV technicians fabricate your parts to your most exacting specifications, and work closely with your team to meet your delivery requirements.

DESIGNED AND FABRICATED TO ACCOMMODATE:

- Thermal Expansion
- End-Beam Rotation
- Vibration Isolation
- Seismic Acceleration

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CON-SERV

BUILDING



AMERICA

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CON-SLIDE BEARINGS SYSTEMS

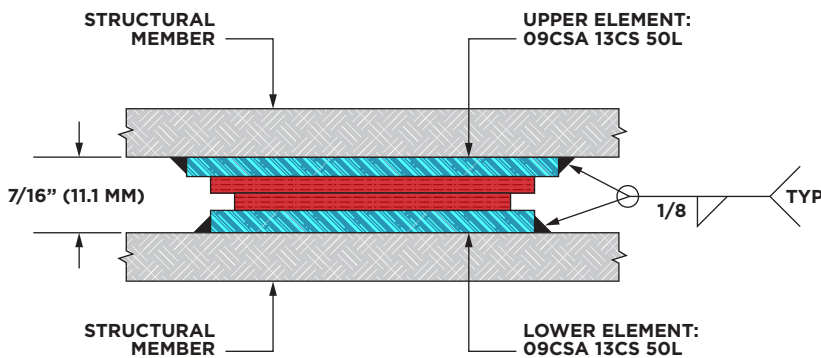
TYPE CSA & CSB

CON-SLIDE™ slide bearings are constructed of filled PTFE bonded to flat rigid back-up steel. CON-SLIDE™ slide bearings are designed to reduce friction at loaded expansion and contraction joints in bridges, buildings, pipelines, etc. The CON-SLIDE™ material, at thermal expansion and contraction rates, will exhibit little or no wear for the life of the structure.

CON-SLIDE™ TYPE CSA (75 psi to 2000 psi)

This blend (CSA) was formulated as a slide material for use against itself.

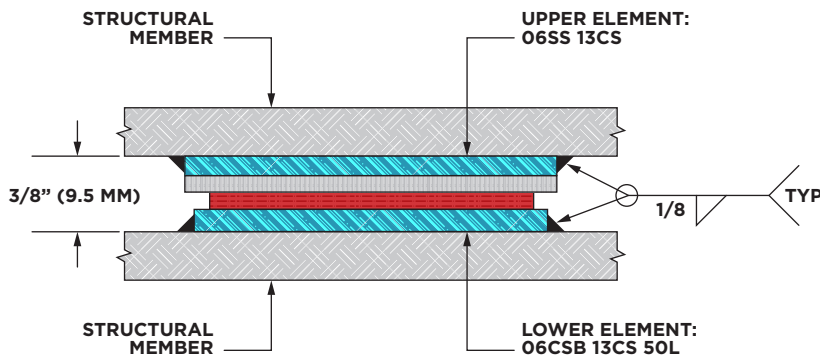
The CSA system consists of an upper and lower element. The PTFE slide surfaces in this system are nominally 3/32" thick and are control-bonded to a 10-gauge carbon steel (CS) back-up sheet. Normally the upper element is larger than the lower element to accommodate the amount of anticipated movement. See Graph 1 on page 5 for allowable design pressures at various temperatures.



CON-SLIDE™ TYPE CSB (2000 psi to 4000 psi)

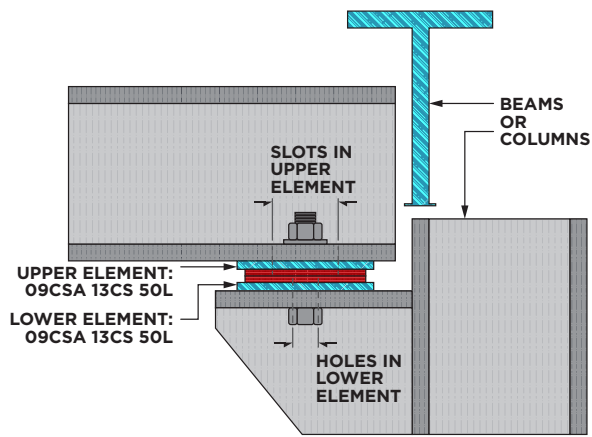
This blend (CSB) was formulated for use as a slide material against a smooth stainless steel surface.

The CSB system consists of an upper and lower element. The PTFE surface is on the smallest element. It is nominally 1/16" thick and is control-bonded to a 10-gauge carbon steel (CS) back-up sheet. The larger element is composed of a 16-gauge stainless steel (SS) sheet, resistance-welded to a 10-gauge carbon steel back-up sheet. See Graph 1 on page 5 for allowable design pressures at various temperatures.

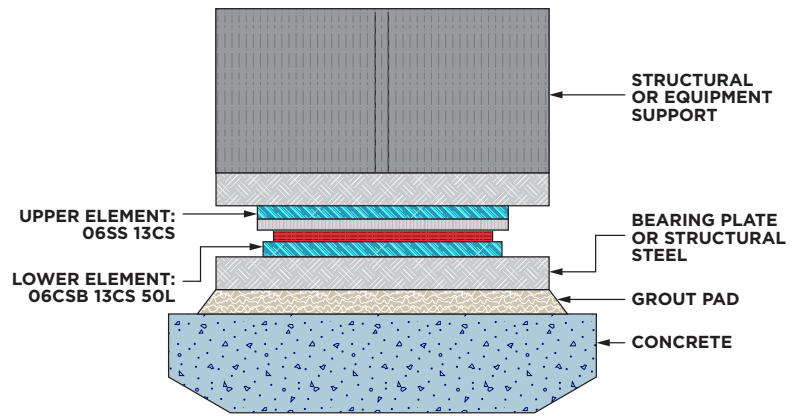


For higher temperature bearings and high load bearings, see pages 9-14.

CSA EXAMPLE



CSB EXAMPLE



SIZING FOR TYPES CSA AND CSB

The design engineer shall determine the square inches of bearing area required for the lower element by dividing the load by the allowable pressure indicated in the graph. The upper element is sized for movement after the lower element is sized for load.

CON-SERV can supply any practical element size cut from stock steel. Size is out to out of back-up plate.

For ease of installation, CON-SERV recommends a back-up plate 1" larger than the CSA or CSB to allow a 1/2" recess all around. This recess must be provided for plates requiring a seal weld.

50L = 1/2" lip all around. If 50L cannot be specified, use a minimum amount of welding to avoid overheating the slide plate. Slide plates smaller than 3" x 3" must have a 1/2" lip all around for either tack or seal welding.

ALTERNATE SPECIFIERS:

SLOTS AND HOLES

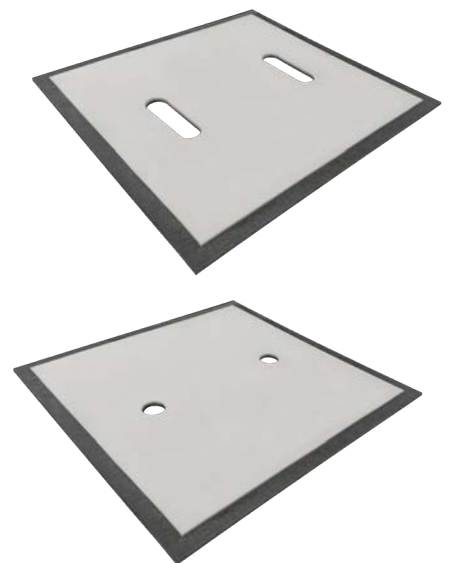
If bolts pass through the elements, usually the upper element is slotted for movement; the lower element has holes in it. Example: Add two 13/16" x 2" slots in the upper plate and two 13/16" holes in the lower.

STUDS OR ANCHORS

If studs or anchors are welded to the back-up plate, use a back-up plate with a thickness approximately equal to the stud diameter. Example: Add two 1/4" diameter x 4" Nelson Studs.

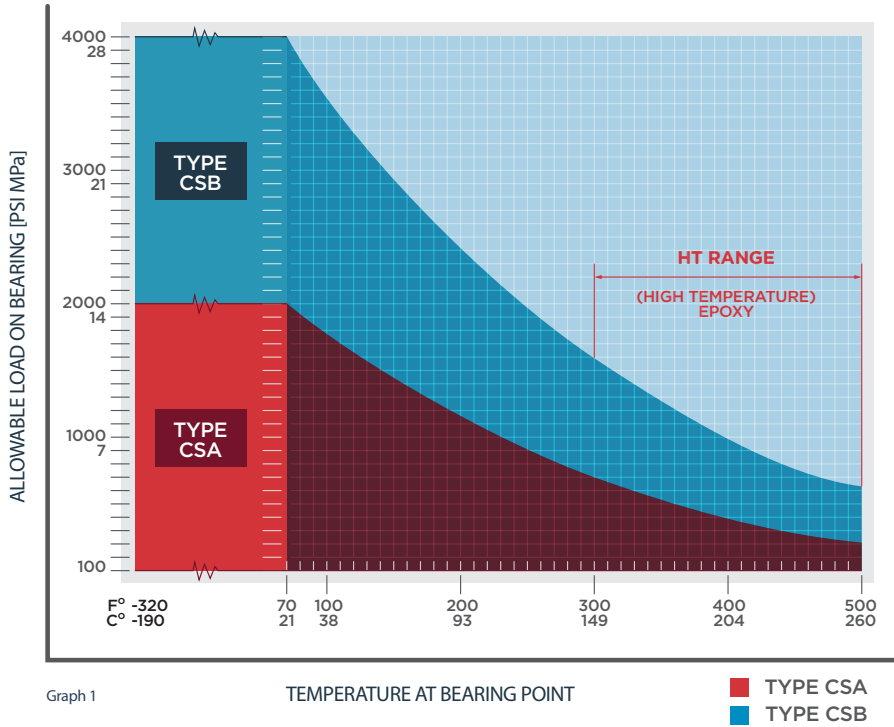
HIGH TEMPERATURE

If the Bearing Point temperature exceeds 300°F, add HT to the call out.



Example: Slots & Holes

TEMPERATURE VS. ALLOWABLE LOAD



How to specify
Both Types (CSA & CSB)
Standard bearing assemblies
examples:

Type CSA

Upper
09CSA 13CS 50L* 9" X 9"
Lower
09CSA 13CS 50L* 8" X 8"

*09 = 3/32", 13 = 10 GA.

Type CSB

Upper
06SS 13CS 12" X 12"
Lower
06CSB 13CS 50L* 11" X 11"

*06 = 1/16", 13 = 10 GA.

TYPE CSA	SLIDE SURFACE		BACK-UP PLATE	
	Thickness	Material	Thickness	Material
	09 = 3/32"	CSA	13 = 10 GA	CS - Carbon Steel
Upper & Lower	Alternates:		Alternates:	
	06 = 1/16"	CSA	25 = 1/4" P 37 = 3/8" P 50 = 1/2" P 75 = 3/4" P 100 = 1" P etc.	SS = Stainless Steel CT = Corten Steel GL = Galvanized Steel AL = Aluminum

TYPE CSB	SLIDE SURFACE		BACK-UP PLATE	
	Thickness	Material	Thickness	Material
Upper	06 = 16 GA	SS	13 = 10 GA	CS - Carbon Steel
	Alternates:		Alternates:	
	03 = 20 GA 07 = 14 GA 12 = 11 GA 18 = 7 GA	SS	25 = 1/4" P 37 = 3/8" P 50 = 1/2" P 75 = 3/4" P 100 = 1" P etc.	SS = Stainless Steel CT = Corten Steel GL = Galvanized Steel
Lower	06	CSB	13	CS - Carbon Steel
	Alternates: Virgin PTFE (CSC) & other thicknesses available upon request		Alternates: (See above)	Alternates: (See above)

TYPE CSA & CSB TECHNICAL SECTION

The blended CSA/CSB material used for this bearing is composed of virgin (unreprocessed) PTFE resin tested per ASTM D4894 or D4895 and reinforcing agents including milled glass fibers per ASTM D4745. This structural material has the following representative mechanical and physical properties:

Actual values per lot are available upon request which might vary due to processing factors.

- Certifications for the epoxy, steel and CSA/CSB materials are available upon request.

TYPE CSA

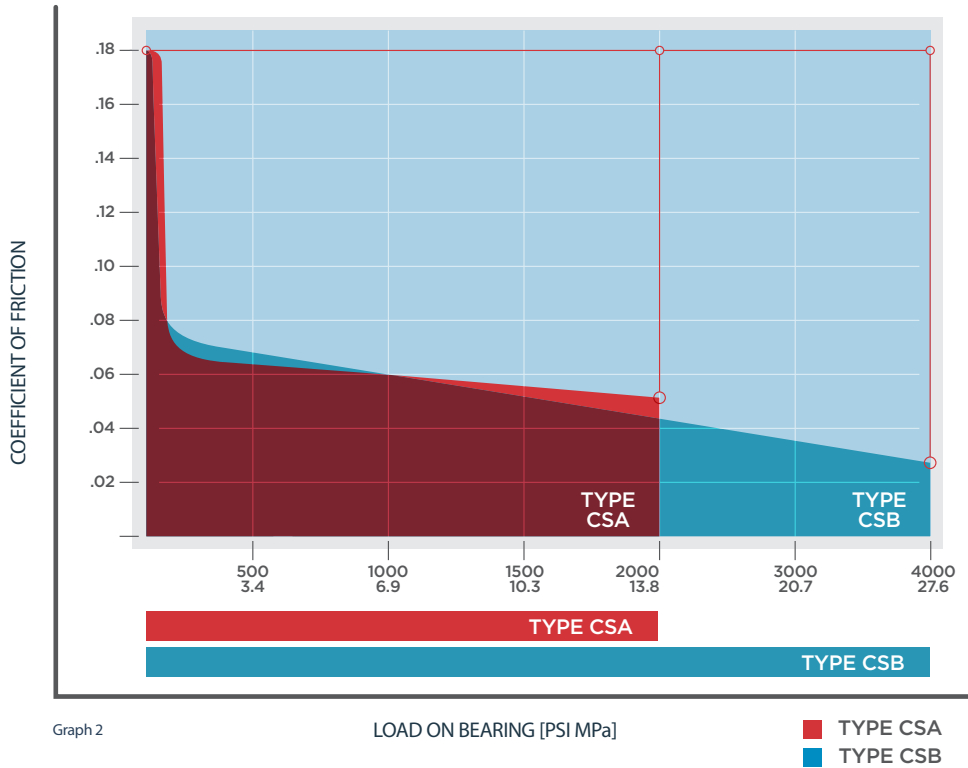
- Tensile Strength: 2200 psi
- Elongation: 225%
- Specific gravity: 2.17 → 2.22

TYPE CSB

- Tensile Strength: 3500 psi
- Elongation: 300%
- Specific gravity: 2.14 → 2.21

COEFFICIENT OF FRICTION VS. LOAD

TEST SPEED: 1"/min. (25.4 mm/min.) TEMPERATURE: 70° F (21° C)



COEFFICIENT OF FRICTION

The coefficient of friction plotted is a maximum value after first movement breakaway. Friction values will rise with increased speed. The graph values will increase approximately 45% for a speed increase to 10 in./min.

The epoxy compound used by CON-SERV has been tested and formulated for bonding CSA and CSB to backing materials. The bond strength developed has a safety factor of 5 to 6 on a sliding shear, assuming no friction between the special PTFE and the back-up plate. We ensure these strengths at temperatures between 300° and 500° F with a special epoxy for HT bearings (see graph on page 5). Some manufacturers use one epoxy for their complete temperature range, which may jeopardize bearing safety at higher temperatures.

GUIDELINES

WEAR

Wear of CON-SLIDE™ bearings utilized in thermal expansion applications designed under the guidelines presented herein is negligible.

CON-SERV has independent laboratory tests available to certify the performance of CON-SLIDE™ bearings in cold weather. The tests were conducted per the original Alyeska Pipeline Specification. Thermal cycling from -70° F to +100° F was performed on both CSA and CSB CON-SLIDE™ bearings. They proved to perform excellently.

ULTRAVIOLET TESTING

Tests indicate that our CSA and CSB materials show no ill effects from a time-accelerated test set up. Once in place, the bearings are protected by the envelope steel on either side of the CSA or CSB material as well as shading by the structure.

GUIDE SPECIFICATION (TYPE CSA)

The following specification for CON-SLIDE™ Slide Bearings (Type CSA) will give the engineer a quality product when installed:

The bearing system, upper and lower elements, shall be CON-SLIDE™ Type CSA elements as manufactured by CON-SERV Inc., Airport Industrial Park, 685 Aviation Boulevard, Georgetown, SC, 29440, Phone: 843-546-1044.

The sliding surfaces shall be a nominal 3/32" glass-filled virgin PTFE factory-bonded with a tested epoxy to a steel back-up plate. The bonding shall be done in a heated bonding press under a controlled time, temperature and pressure. The coefficient of friction shall average .06 under a compressive load of 2000 psi. The compressive creep shall be a maximum of 2% at 2000 psi and 70° F.

The elements shall be flat, clean and prepared for installation in the structure. Slots and holes, if required, shall be fabricated in the bearing manufacturer's plant.

GUIDE SPECIFICATION (TYPE CSB)

The following specification for CON-SLIDE™ Slide Bearings (Type CSB) will give the engineer a quality product when installed:

The bearing system consists of an upper element faced with stainless steel and a lower element faced with filled PTFE, as manufactured by CON-SERV Inc., Airport Industrial Park, 685 Aviation Boulevard, Georgetown, SC, 29440, Phone: 843-546-1044.

The stainless steel shall be no less than 16-gauge A240 Type 304, having a surface finish of 2B or better on the side in contact with the CSB. The stainless steel shall be TIG stitch welded or spot welded around the periphery. The CSB is a nominal 1/16" glass-filled virgin PTFE factory-bonded with a tested epoxy to a steel back-up plate. The bonding shall be done in a heated bonding press under a controlled time, temperature and pressure.

The coefficient of friction shall average .05 under a compressive load of 2000 psi. The compressive creep shall be a maximum of 2% at 2000 psi and 70° F.

The elements shall be flat, clean and prepared for installation in the structure. Slots and holes, if required, shall be fabricated in the bearing manufacturer's plant.

INSTALLATION OF CON-SLIDE™ SLIDE BEARINGS

CON-SLIDE™ bearings with PTFE flush against the edges of the steel back-up plate should be stitch welded for attachment to the structure. A fillet weld 1" long every 6" on center on each side of the element is satisfactory. Usually one tack weld on each side is sufficient for elements 6" on a side or smaller.

The recessed-PTFE type bearing can be stitch welded or seal welded. Minimize heat input onto the bearing with a skip-and-fill technique for seal welding (300° F for standard bond and 500° F for HT bond).

A CON-SLIDE™ bearing set usually consists of the larger element being the upper unit over the smaller lower element, thus eliminating the possibility of accumulating dirt or contaminants on the interface. The bearing will function with a larger lower element, however. The PTFE surfaces of the bearings shall be maintained clean and free from grit, dirt or grease.

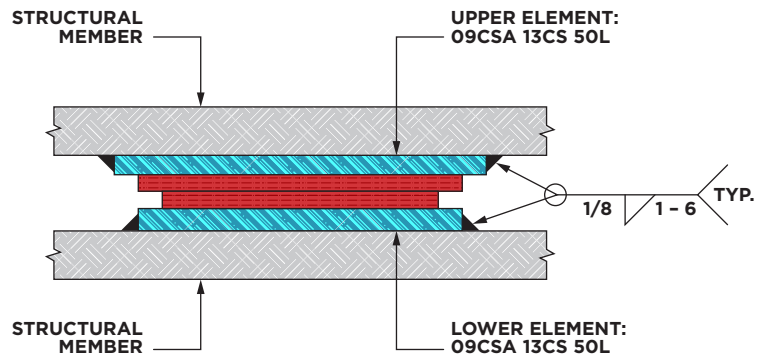
Bearing elements with slots or holes should be welded in place to ensure slot or hole location.

The bearing slide surfaces must be protected during welding and maintained clean and free from foreign matter. The surface, if PTFE, must not be exposed to direct sunlight. Keep the PTFE surfaces covered.

Remove vinyl masking from stainless steel slide surfaces before final placement in the structure. Do not scratch or mar surfaces.

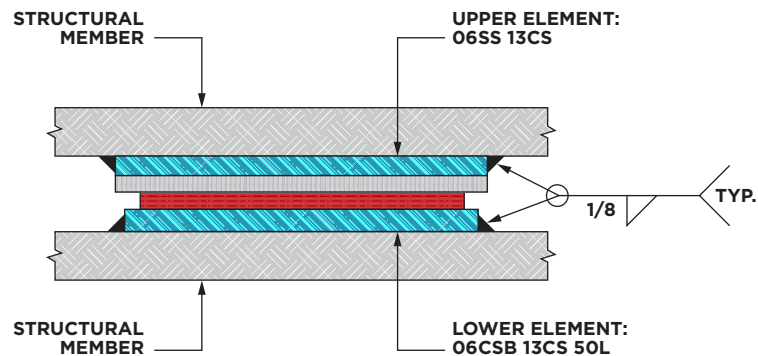
TYPE CSA

STANDARD WELD STITCH WELDED



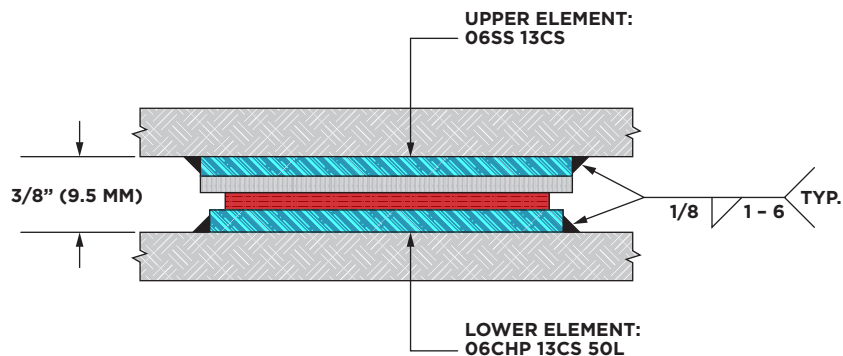
TYPE CSB

CONTINUOUS WELD SKIP AND FILL

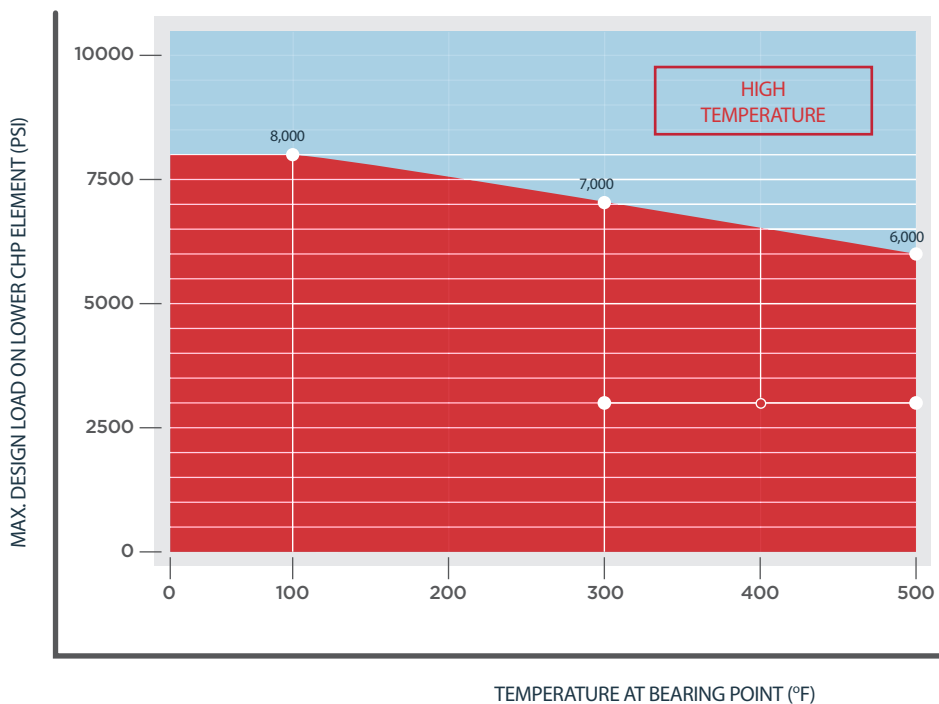


CON-SLIDE™ HIGH-LOAD TYPE CHP BEARINGS

CON-SLIDE™ CHP bearing systems combine the self-lubricating, low-friction characteristics of PTFE with the high tensile strength characteristics of synthetic fibers. This unique system employs a stainless steel upper element sliding on a CHP lower element. This two-element concept has been accepted worldwide for use in major pipeline, bridge, building and industrial applications. The system will yield long life under high load conditions, and give the designer high pressure allowable loads even at design temperatures of 500° F.



The design engineer shall determine the square inches of bearing area required for the lower element by dividing the load by the allowable pressure indicated in the graph. The upper element is sized for movement after the lower element is sized for pressure. Size is out to out of back-up plate.



For ease of installation, CON-SERV recommends a back-up plate 1" larger than the PTFE size to allow a 1/2" recess all around. This recess must be provided for plates requiring a seal weld.

This bearing system has been tested in a long cycle friction apparatus. The coefficient of friction at 70°F for the load ranges indicated varies from 4% to 5%. This variation is due to the initial break-in period, not due to the variation in pressure.

When friction was recorded at the design temperature limit of 500°F, it was 2-1/2% to 1-1/2%, depending on the dwell time at 500°F. It is interesting to note that friction decreases with increases in either load or temperature.

GUIDE SPECIFICATION

The following specifications for CON-SLIDE™ (Type CHP) Slide Bearings will give the engineer a quality product when installed:

The bearing system consists of an upper element faced with stainless steel and a lower element faced with Type CHP, as manufactured by CON-SERV Inc., Airport Industrial Park, 685 Aviation Blvd., Georgetown, SC 29440, Phone: 843-546-1044.

The stainless steel shall be no less than 16-gauge A240 Type 304 having a surface finish of less than 20 micro-inches RMS on the side in contact with CHP. The stainless steel shall be TIG stitch welded or spot welded around the periphery. The CHP material is a nominal 1/16" thick bonded in a heated bonding press under a controlled time, temperature and pressure.

The coefficient of friction shall average .04 at 6000 psi at 70°F. The element shall be flat and clean. Slots and holes, if required, shall be fabricated in the bearing manufacturer's plant.

TYPE CHP	SLIDE SURFACE		BACK-UP PLATE	
	Thickness	Material	Thickness	Material
Upper	06	SS	13 = 10 GA	CS - Carbon Steel
	Alternates:		Alternates:	
	03 = 20 GA 07 = 14 GA 12 = 11 GA 18 = 7 GA	SS	25 = 1/4" P 37 = 3/8" P 50 = 1/2" P 75 = 3/4" P 100 = 1" P etc.	SS = Stainless Steel CT = Corten Steel GL = Galvanized Steel
Lower	06	CHP	13	CS - Carbon Steel
			(See above)	(See above)

How to specify High Load Bearings:
Type CHP

Upper Element

06SS 13CS 10" X 10"

06 = 1/16"

SS = Stainless Steel

Lower Element

06CHP 13CS 50L* 8" X 8"

06 = 1/16"

CHP = CON-SERV High Load Material

*50L = 1/2" Recommended Lip All Around

INSTALLATION OF CON-SLIDE™ TYPE CHP BEARINGS

See installation instructions on page 8.

CON-SLIDE™ HIGH-TEMPERATURE EXPANSION BEARINGS

BRONZE, MEEHANITE®, GRAPHITE

*Meehanite is a trademark of Meehanite Worldwide

- Self-Lubricated Bronze
- Self-Lubricated Meehanite
- Graphite Cradles & Graphite Steel Backed Slide Plates
- Insulated High-Temperature, Low-Friction Assemblies

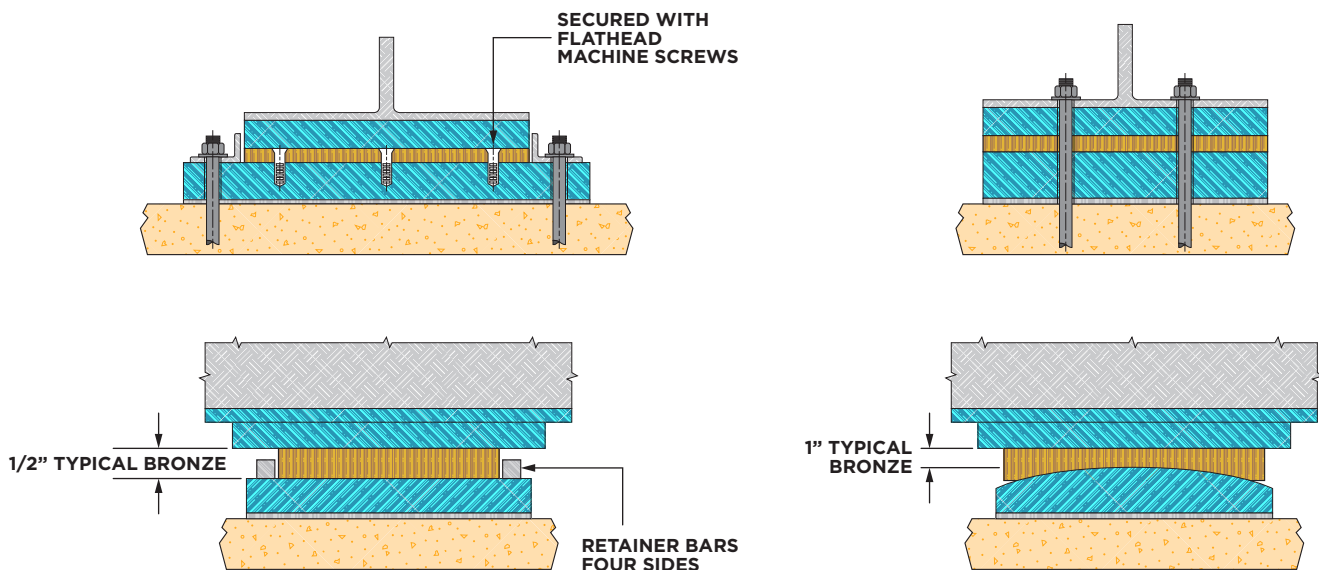
SELF-LUBRICATED BRONZE BEARINGS

CON-SERV offers slide bearings in a variety of alloys which are approved for nuclear, structural, industrial and bridge applications:

The following information is representative of cast alloys used for expansion bearing plates:

Type	ASTM Specification	Former Alloy No.	Recommended Design Pressure at 250°F Slow Moving Applications	Max. Use Temp. (Cont.)
Hi Tin Bronze	B22 Alloy C91300	"A"	3000 PSI	250° F
Hi Tin Bronze	B22 Alloy C91100	"B"	2500 PSI	250° F
Hi-Leaded Tin Bronze	B22 Alloy C93700	"C"	1000 PSI	450° F
Leaded Bronze	B22 Alloy C90500*	"D"*	2000 PSI	600° F
Manganese Bronze	B22 Alloy C86300	"E"	3500 PSI	800° F
Aluminum Bronze	B148 Alloy C95400	"9C"	2500 PSI	600° F
*Modified with up to 2-1/2% lead.				

INSTALLATION EXAMPLES: OF BRONZE AND MEEHANITE



SELF-LUBRICATED BRONZE BEARINGS

These bronzes are lubricated to approximately 25% of the bearing surface. The standard lubricant takes temperatures up to 250°F. Lube 1 has a temperature range from 250°F to 500°F. Lube 2 has a temperature range from 500°F to 800°F. For nuclear applications (normal containment, atmosphere including borated water spray, and radiation below 2.2×10^6 rads), use Lube AE for all temperatures to 800°F. Slots and holes, if required, shall be fabricated in the bearing manufacturer's plant.

Designers use 15% friction factor as a practical figure and increase this for high temperature applications (greater than 500°F). Any mating steel surfaces should be finished to a 63 to 125 RMS.

Bronze bearings are cast, machined and lubricated. Edges should be specified "as-cast" or machined.

For alloy C90500 Modified, the maximum design pressure is 800 psi at 600°F. For alloy C86300, the maximum design pressure is 1000 psi at 800°F. A straight-line interpolation is appropriate between the 250°F design pressure and the maximum use temperature pressure.



Hi-Temp Self Lubricated Bronze Bearing

SELF-LUBRICATED MEEHANITE

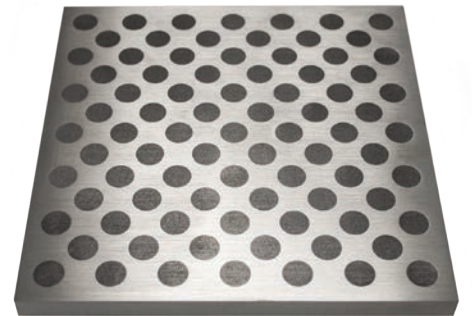
Meehanite bearings are generally used for temperatures from 500°F to 1000°F.

This material is a form of gray cast iron which is lubricated with PTFE or graphite. For Meehanite sliding against a ground steel plate (63 to 125 RMS), a design friction factor of 15% is appropriate.

Grade Type GA50 (50,000 Tensile Strength) is usually specified for bearing applications.

For lubricated Meehanite, the following design pressures are appropriate at the respective temperatures:

- 7000 psi @ 500°F
- 5000 psi @ 600°F
- 3000 psi @ 700°F
- 2000 psi @ 800°F
- 1000 psi @ 1000°F



High Temperature Meehanite Bearing

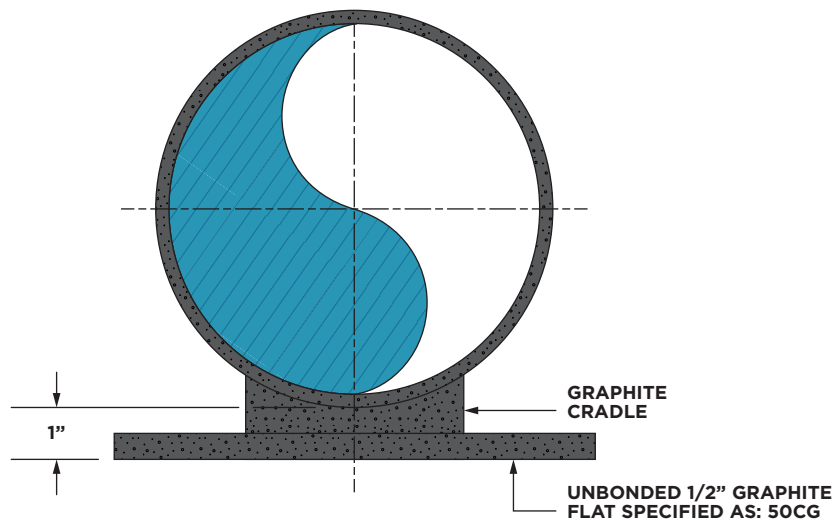
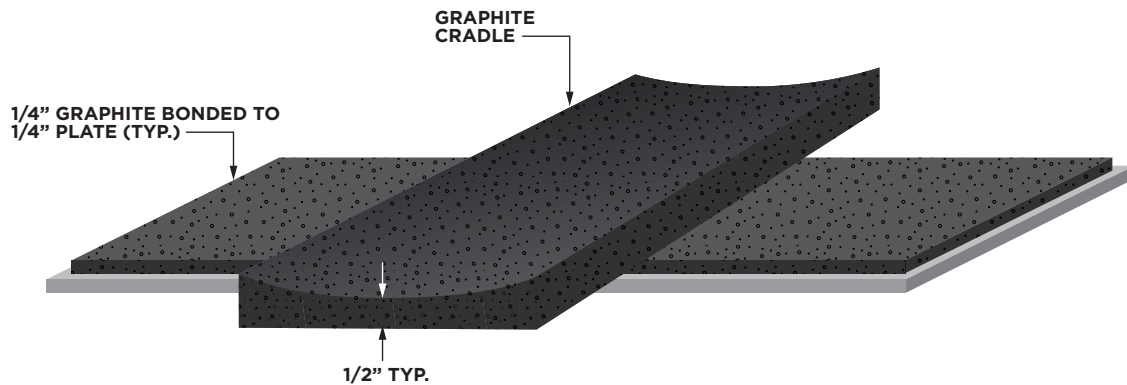
GRAPHITE CRADLES & GRAPHITE STEEL-BACKED SLIDE PLATES

Typical Design Properties:

- Compressive Strength: 2000 psi
- Coefficient of friction: Static 0.15
- Maximum Service Temperature: 750° F on graphite

Wear is negligible when sliding against itself. Graphite may be purchased bonded to steel back-up plates or structural shapes as the job may require. Bonding epoxy is available. The maximum temperature limit on the epoxy is 300° F. High temperature applications require mechanical attachment of the graphite. ML written at the end of the bearing callout would signify mechanical locking of graphite - i.e., 25CG 25CS 25L ML.

Unbonded flats are typically 1/2" thick. Bonded 1/4" graphite to 1/4" steel is specified as: 25CG 25CS 50L. Typically the steel plate is 1" larger in both width and length than the graphite for field welding.

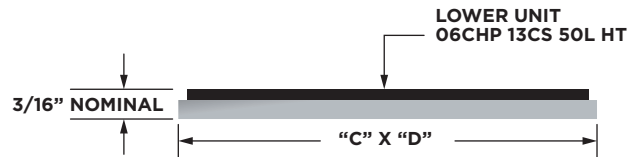
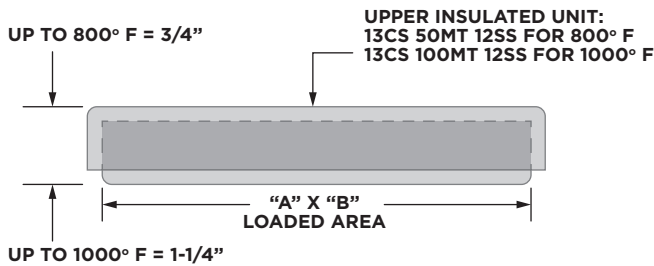
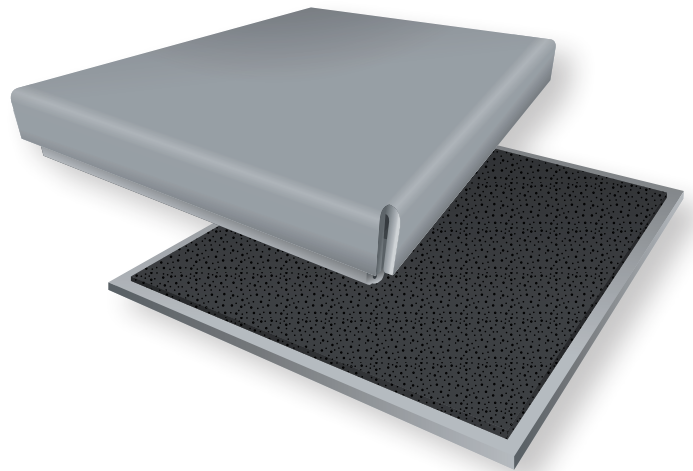
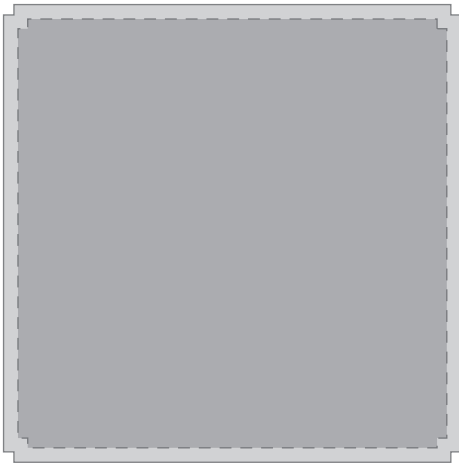


INSULATED HIGH-TEMPERATURE, LOW-FRICTION ASSEMBLIES

DESIGN PARAMETERS

This bearing system enables the designer to enjoy the low friction of PTFE at a bearing point temperature above the use limit (500° F) of PTFE. These bearings provide a coefficient of friction less than 3% at a design pressure of 2500 psi (max.) with little variation at lesser pressures.

The bearings can be installed with a stitch weld 1/2" long 3" on center on all sides. The upper and lower units must be backed up with structural plates so that a uniform load is transmitted into the unit. Bending of the unit is unacceptable.



Size Upper Unit as follows:	Size Lower Unit as follows:
$\frac{\text{Load (kip)}}{2.5}$	$C = A + \text{Total Movement this direction} + 1 \text{ in.}$ $D = B + \text{Total Movement this direction} + 1 \text{ in.}$
Size A & B so that A x B = Square Inches Required	

How to Specify		
Upper Unit:	Up to 800° F 13CS 50MT 12SS (Quantity) A x B	Up to 1000° F 13CS 100MT 12SS (Quantity) A x B
Lower Unit:	06CHP 13CS 50L HT (Quantity) C x D	06CHP 13CS 50L HT (Quantity) C x D

Alternative materials available: Please consult CON-SERV Engineering Department personnel.

CON-SLIDE™ ELASTOMERIC BEARINGS

ELASTOMERIC BEARINGS

CON-SERV provides neoprene and natural rubber elastomeric bearing pads to provide structural support in bridges, as well as in commercial and industrial buildings, and petrochemical and power plants. These parts, depending on the type of elastomer, provide uniform load transfer, accommodate thermal movement, allow for end-beam rotation and isolate components of the structure against vibration, noise and shock. CON-SERV produces both AASHTO-grade neoprene and AASHTO-grade preformed fabric pads. These can also be supplied with filled PTFE bonded to them for use as the lower element in a slide bearing, which will provide both the longitudinal movement and rotation required.

NATURAL RUBBER/NEOPRENE TYPES

Plain and shimmed bearings are available in standard Shore A durometers of 50, 60 or 70 based on state and/or AASHTO Code, Section 18, natural rubber or neoprene. For economy, a commercial grade is also available.

PTFE-surfaced neoprene-backed slide bearings are also available. Type CSA material is recommended bonded to a 10-gauge steel laminate which has been bonded to neoprene. If minimum dead load pressure is less than 200 psi, it is recommended that the elastomer be epoxy-bonded to concrete. If on steel, a tack plate is recommended for positive reinforcement. The maximum temperature at a neoprene bearing is 200° F.

Type NES Shimmed Neoprene



Type NEP Plain Neoprene



RANDOM FIBER REINFORCED SLIDE BEARINGS

Type RFR

Physical Properties:

- Durometer: 80 ± 5 (Shore A)
- Compressive Strength: 8,000 psi max.
- Tensile Strength: 1,000 psi

Type RFR Random Fiber Reinforced



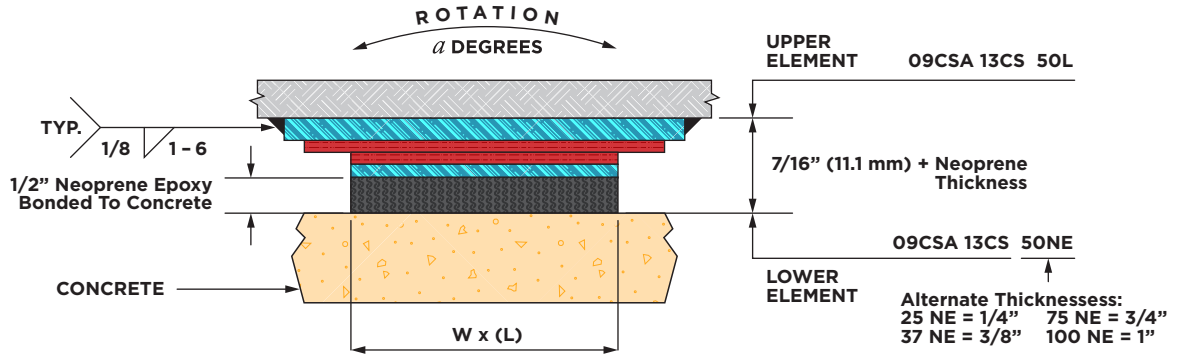
This material will substitute for neoprene in areas where vibration or heavier loads are present. The random fiber material is well suited to concrete construction as a cost-saving alternative to neoprene or preformed fabric pads. Type RFR materials may be provided with holes, slots or PTFE surfaces.

CON-SLIDE™ Type RFR may also be used in conjunction with a Type CSA or CSB assembly.

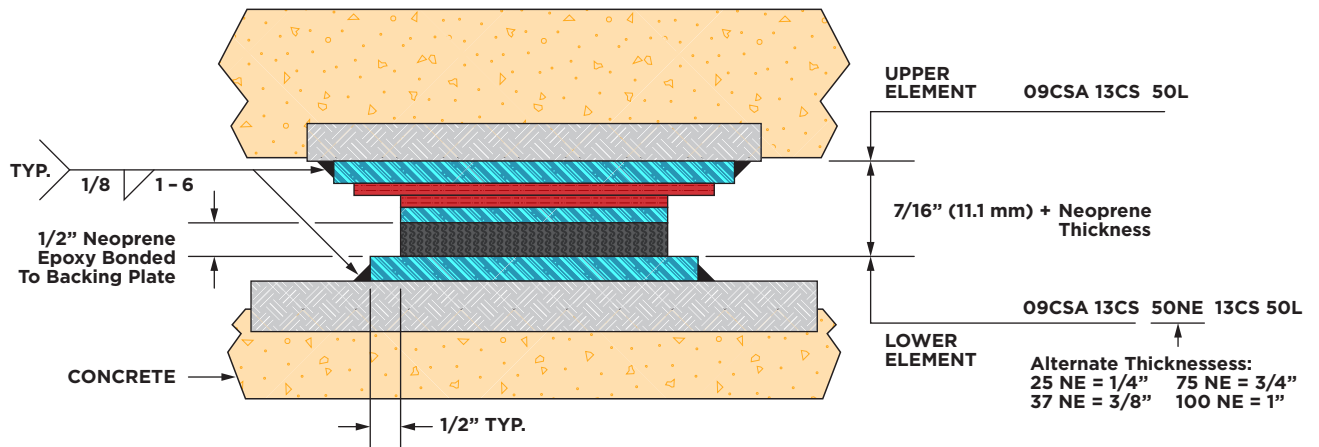
Please consult CON-SERV Engineering Department personnel.

HOW TO SPECIFY

NEOPRENE-BACKED SLIDE BEARING



ALTERNATE LOWER ELEMENT FOR WELDING



GUIDE SPECIFICATION

The CON-SLIDE™ bearing guide specification for Type CSA can be utilized as a guide for PTFE neoprene backed bearings. The neoprene must be factory bonded to the steel carrying the PTFE. The neoprene must be in accordance with the latest AASHTO requirements.

PREFORMED FABRIC REINFORCED ELASTOMERIC

Type PF

Physical Properties:

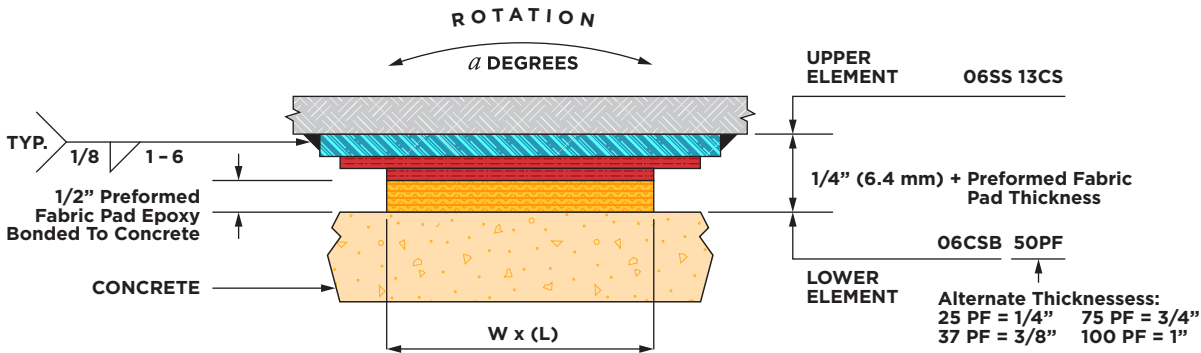
Please contact Con-Serv engineering department if your design average pressure exceeds 1500psi.

- Durometer: 90 ± 5 (Shore A)
- Compressive Strength: 10,000 psi max.
- Maximum Design Pressure: 1500 psi
- AASHTO & AREMA Grade

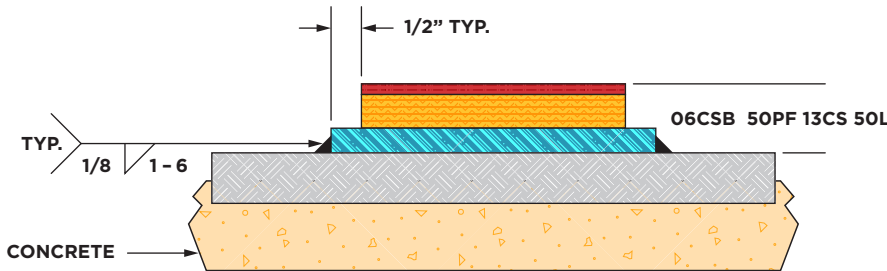


Type PF Preformed Fabric Pad

PREFORMED FABRIC REINFORCED ELASTOMERIC SLIDE BEARINGS



ALTERNATE LOWER ELEMENT FOR WELDING



TECHNICAL SECTION

The following formula has proven successful in calculating the thickness of the preformed fabric pad to accept a given rotation. This formula allows for the internal stresses built up in the pad upon rotation.

Uniform Pressure on Pad (PSI)	800	1000	1200	1500
Coefficient "C"	.08	.06	.0421	.0185
Maximum recommended rotation in radians (tan a)	.02	.02	.02	.02

GUIDE SPECIFICATION

The CON-SLIDE™ bearing guide specification for Type CSB can be utilized as a guide for PTFE preformed fabric pad-backed bearings.

The preformed fabric pad shall comply with the AASHTO specification DIV. II SECT 18. The pad also shall comply with MIL-C-882-E Military Specification and P.C.I. Prestressed Concrete Design Manual.

$$PF \text{ Thickness Required} = \frac{W}{2} \times \frac{\tan a}{"C"}$$

CON-SERV Inc recommends 11 ga. plate be laminated every 2" in pads over 2" thick for strength and stability.

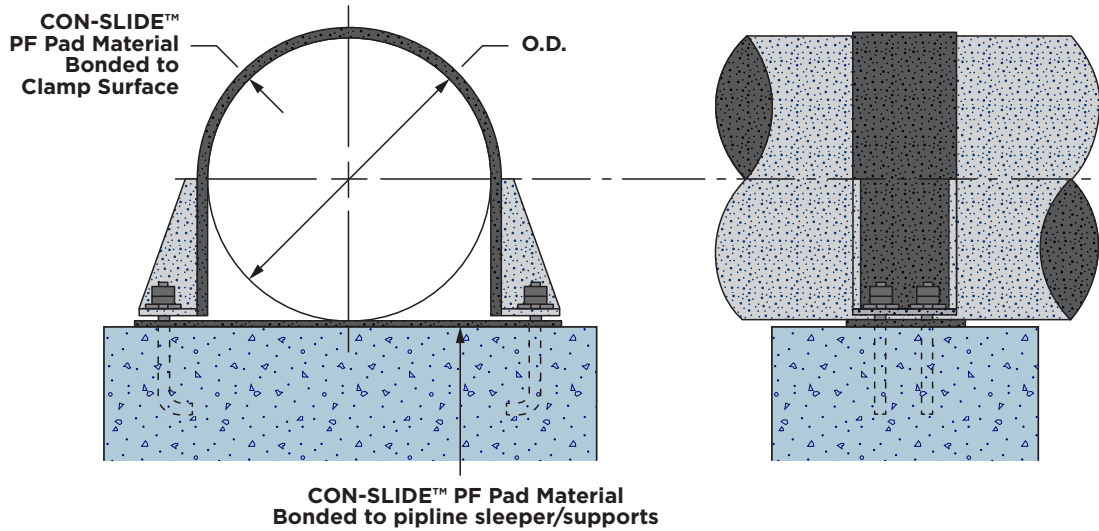
- Friction values are as per Type CSB bearing curve (see page 6)

CON-SLIDE™ PIPE SUPPORTS

CON-SLIDE™ TYPE PF BEARING PADS

HI-LOAD FABRIC ELASTOMERIC BEARING PAD

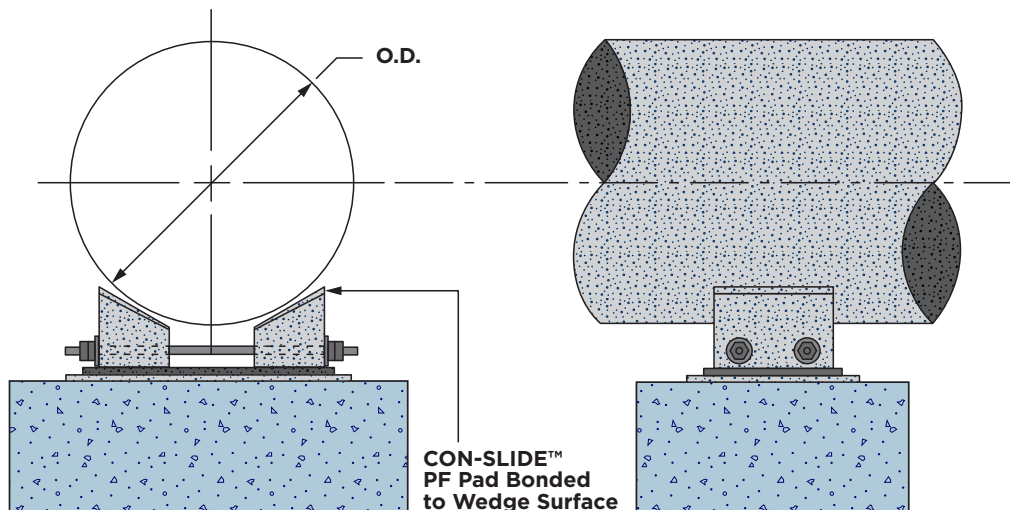
Ideal for heat applications under 200°F, as well as for high pulsation resonance applications, the AASHTO-grade CON-SLIDE™ PF bearing pad helps prevent metal to metal contact and, because of the low spring rate of the isolation pads, isolates components of the structure against vibration.



CON-SLIDE™ - TYPE PF WITH PTFE BEARING PADS

HI-LOAD FABRIC ELASTOMERIC PTFE SLIDE BEARING PAD

Designed for high heat applications (under 400°F) and/or where movement is required. The CON-SLIDE™ PTFE side of the PF bearing pad provides all the qualities of a typical CON-SLIDE™ bearing pad, but incorporates a lower element PF pad bonded with PTFE, which allows for longitudinal movement, rotation and dampening.



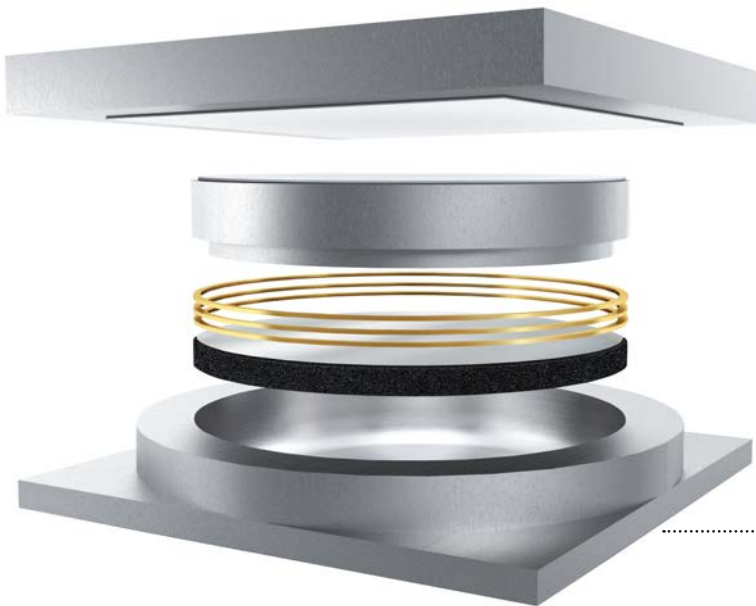
HIGH-LOAD MULTI-ROTATIONAL (HLMR) BEARINGS

CON-SERV Inc offers (3) basic pot & disc bearing types: fixed, guided, and free-moving. In order to give the engineer typical dimensional data, the following criteria was adopted by CON-SERV Inc. as standard for the bearing detailed.

CON-SERV offers other types of designs; consult Engineering Department personnel for design assistance. CON-SERV can supply full friction and proof-load testing on all pot & disc bearing designs.

Standard Design Criteria:

- Steel Type – A588 (Y.P. = 50 KSI)
- Rotation Capacity - .02 radians
- Maximum Pressure on Elastomer – 3500 psi for pots to 5000 psi for discs
- Coefficient of friction - .03
- Lateral Load Capacity – 10% of Vertical Load (Fixed and Guided) – Maximum for Standard Design
- Movement $\pm 1"$ – Maximum for Standard Design



Shown with optional masonry plate

INSTALLATION

The bearings indicated may be welded into the structure or, if required, a leveling plate may be added with anchor bolts and grout for concrete installation.

FINISHES

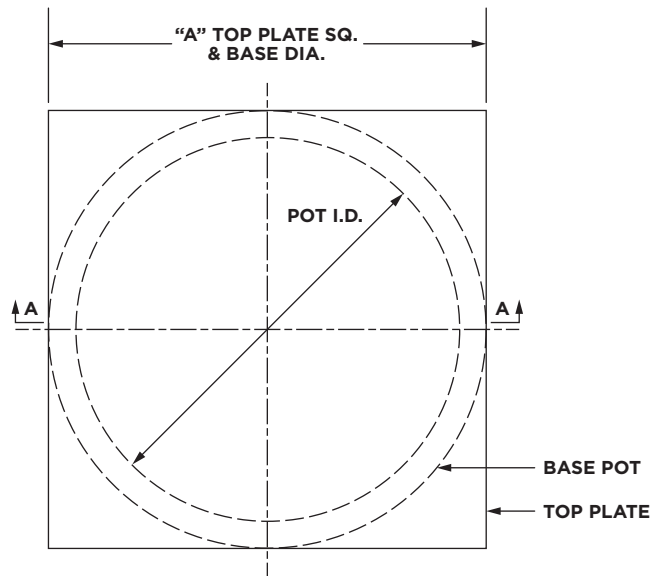
The bearings may be finished per the job specifications. Painting is preferred over hot-dip galvanizing since hot dipping introduces distortion.

SPECIFICATIONS

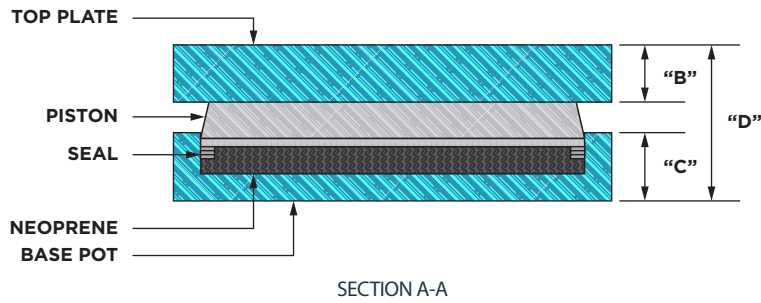
For a complete guide specification, please consult CON-SERV Engineering Department personnel. All HLMR bearings can be designed and fabricated to meet current AASHTO & AREMA Code requirements.

Outside guided design should be used with HLMR bearings with more than 10% Lateral Load. Please consult CON-SERV Engineering Department personnel for complete details.

FIXED
POT BEARING



PLAN VIEW
FIXED POT BEARING



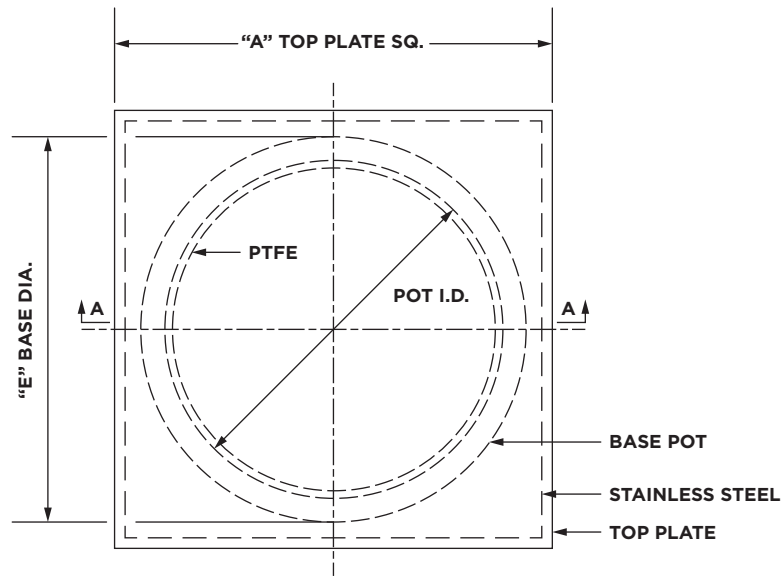
SECTION A-A

Specify: CPB-50F

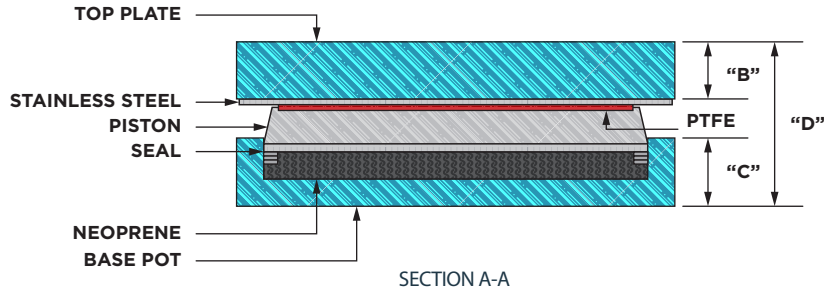


Type	Vert Ld (K)	Pot I.D.	A	B	C	D
CPB-50F	50	4.50	6.00	0.75	1.86	3.38
CPB-75F	75	5.25	6.75	0.75	1.87	3.38
CPB-100F	100	6.25	7.75	0.75	1.88	3.38
CPB-125F	125	6.75	8.25	0.75	1.89	3.38
CPB-150F	150	7.50	9.00	0.75	1.89	3.38
CPB-200F	200	8.75	10.25	0.75	1.91	3.50
CPB-250F	250	9.75	11.25	0.75	1.93	3.50
CPB-300F	300	10.50	12.00	0.75	1.94	3.50
CPB-350F	350	11.50	13.00	0.75	2.21	3.75
CPB-400F	400	12.25	14.00	0.75	2.36	3.88
CPB-450F	450	13.00	14.75	0.75	2.38	4.00
CPB-500F	500	13.50	15.50	0.75	2.51	4.13
CPB-600F	600	15.00	17.00	0.75	2.55	4.13
CPB-700F	700	16.00	18.25	0.75	2.96	4.63
CPB-800F	800	17.25	19.75	0.75	3.10	4.75
CPB-900F	900	18.25	20.75	0.75	3.12	4.75
CPB-1000F	1000	19.25	22.00	0.75	3.53	5.13

FREE MOVING POT BEARING



PLAN VIEW
FREE MOVING POT BEARING



SECTION A-A

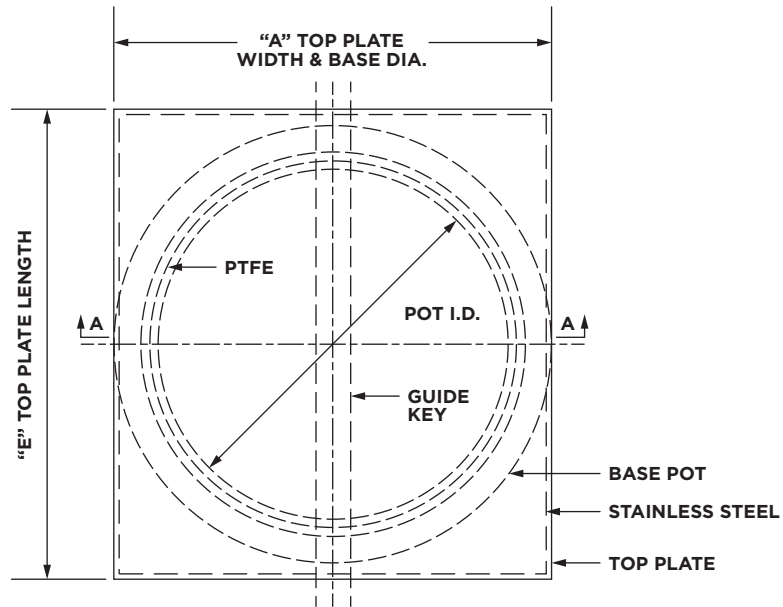
Specify: CPB-50FM

Free Moving Type
Vertical Capacity (K)
CON-SLIDE™ Pot Bearing

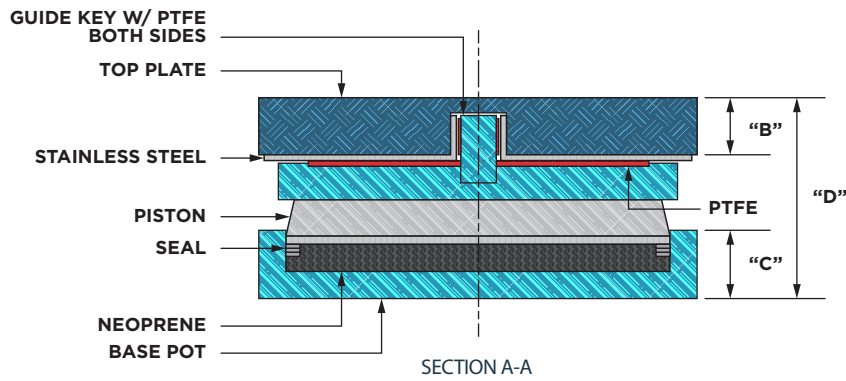
Type	Vert Ld (K)	Pot I.D.	A SQ.TOP	B	C	D	E BASEØ
CPB-50FM (2)	50	4.50	8.25	0.75	1.86	3.50	6.00
CPB-75FM (2)	75	5.50	9.25	0.75	1.87	3.50	7.00
CPB-100FM (2)	100	6.25	10.00	0.75	1.88	3.50	7.75
CPB-125FM (2)	125	7.00	10.75	0.75	1.89	3.63	8.50
CPB-150FM (2)	150	7.50	11.25	0.75	1.89	3.63	9.00
CPB-200FM (2)	200	8.75	12.50	0.75	1.91	3.63	10.25
CPB-250FM (2)	250	9.75	13.50	0.75	1.93	3.75	11.25
CPB-300FM (2)	300	10.75	14.50	0.75	1.95	3.75	12.25
CPB-350FM (2)	350	11.50	15.25	0.88	2.21	4.13	13.00
CPB-400FM (2)	400	12.25	16.25	0.88	2.36	4.25	14.00
CPB-450FM (2)	450	13.00	17.00	0.88	2.38	4.25	14.75
CPB-500FM (2)	500	13.75	18.00	0.88	2.52	4.50	15.75
CPB-600FM (2)	600	15.00	19.25	1.00	2.55	4.63	17.00
CPB-700FM (2)	700	16.25	20.75	1.00	2.95	5.00	18.50
CPB-800FM (2)	800	17.25	22.00	1.00	3.10	5.25	19.75
CPB-900FM (2)	900	18.25	23.00	1.00	3.12	5.25	20.75
CPB-1000FM (2)	1000	19.25	24.25	1.13	3.53	5.75	22.00



CENTER GUIDED POT BEARING



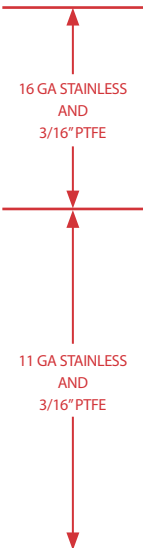
PLAN VIEW
CENTER GUIDED POT BEARING



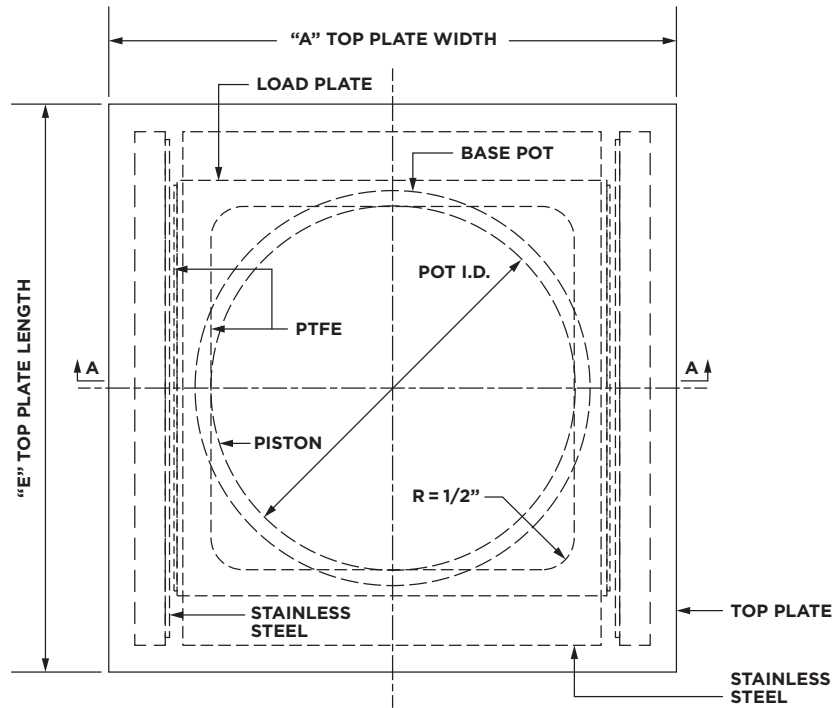
Specify: CPB-50CG

Guided Type
Vertical Capacity (K)
CON-SLIDE™ Pot Bearing

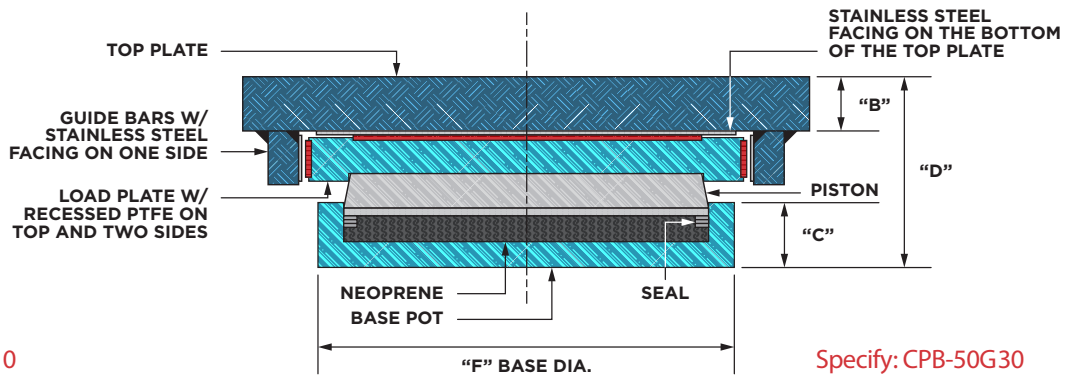
Type	Vert Ld (K)	Pot I.D.	A	B	C	D	E TOPL
CPB-50CG (2)	50	4.50	6.00	1.38	1.86	4.38	8.50
CPB-75CG (2)	75	5.25	6.75	1.38	1.87	4.38	9.50
CPB-100CG (2)	100	6.25	7.75	1.38	1.88	4.38	10.25
CPB-125CG (2)	125	7.00	8.50	1.50	1.89	4.63	11.00
CPB-150CG (2)	150	7.50	9.00	1.50	1.89	4.63	11.75
CPB-200CG (2)	200	8.75	10.25	1.63	1.91	4.75	12.75
CPB-250CG (2)	250	9.75	11.25	1.63	1.93	4.88	13.75
CPB-300CG (2)	300	10.50	12.00	1.75	1.94	5.00	14.75
CPB-350CG (2)	350	11.50	13.00	1.75	2.21	5.25	15.75
CPB-400CG (2)	400	12.25	14.00	1.88	2.36	5.50	16.50
CPB-450CG (2)	450	13.00	14.75	1.88	2.38	5.50	17.25
CPB-500CG (2)	500	13.50	15.50	2.00	2.51	5.75	18.00
CPB-600CG (2)	600	15.00	17.00	2.13	2.55	6.00	19.25
CPB-700CG (2)	700	16.00	18.25	2.13	2.96	6.38	20.50
CPB-800CG (2)	800	17.25	19.75	2.25	3.10	6.75	21.75
CPB-900CG (2)	900	18.25	20.75	2.38	3.12	6.88	22.75
CPB-1000CG (2)	1000	19.25	22.00	2.38	3.53	7.38	23.75



OUTSIDE GUIDED POT BEARING



PLAN VIEW
OUTSIDE GUIDED DISC BEARING



SECTION A-A

Specify: CPB-50G10

10% Lateral Load
Guided Type
Vertical Capacity (K)
CON-SLIDE™ Pot Bearing

Specify: CPB-50G30

30% Lateral Load
Guided Type
Vertical Capacity (K)
CON-SLIDE™ Pot Bearing

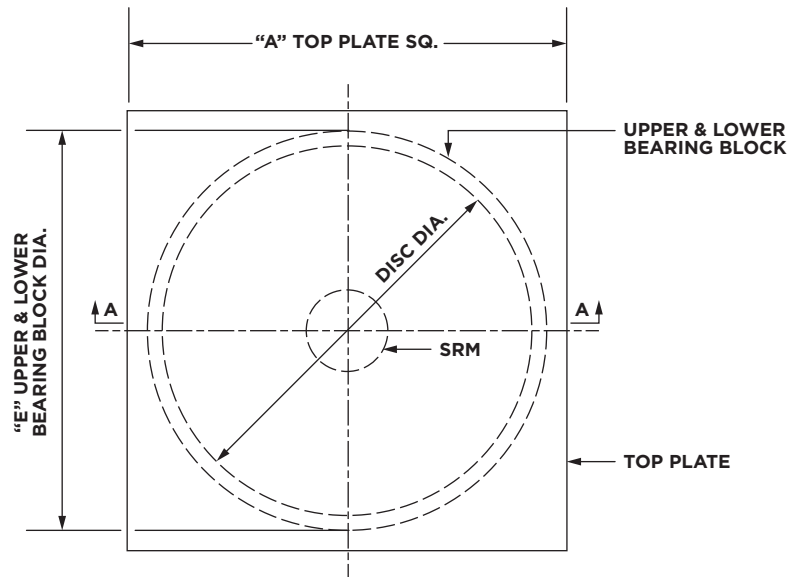
Type	Vert Ld (K)	Pot I.D.	A TOP W	B	C	D	E TOP L	F BASE Ø
CPB-50G10 (2)	50	4.50	10.50	0.75	1.86	4.25	8.75	6.00
CPB-75G10 (2)	75	5.25	11.25	0.75	1.87	4.25	9.50	6.75
CPB-100G10 (2)	100	6.25	12.25	0.75	1.88	4.25	10.50	7.75
CPB-125G10 (2)	125	6.75	12.75	0.88	1.89	4.38	11.00	8.25
CPB-150G10 (2)	150	7.50	13.50	0.88	1.89	4.50	11.75	9.00
CPB-200G10 (2)	200	8.75	14.75	0.88	1.91	4.50	13.00	10.25
CPB-250G10 (2)	250	9.75	16.00	1.00	1.93	5.00	14.00	11.25
CPB-300G10 (2)	300	10.50	17.00	1.13	1.94	5.13	14.75	12.00
CPB-350G10 (2)	350	11.50	18.00	1.13	2.21	5.37	15.75	13.00
CPB-400G10 (2)	400	12.25	19.00	1.13	2.36	5.50	16.75	14.00
CPB-450G10 (2)	450	13.00	19.75	1.13	2.38	5.50	17.50	14.75
CPB-500G10 (2)	500	13.50	20.75	1.25	2.51	6.13	18.25	15.50
CPB-600G10 (2)	600	15.00	22.50	1.25	2.55	6.13	19.75	17.00
CPB-700G10 (2)	700	16.00	23.75	1.38	2.96	6.63	21.00	18.25
CPB-800G10 (2)	800	17.25	25.50	1.50	3.10	7.25	22.50	19.75
CPB-900G10 (2)	900	18.25	26.75	1.50	3.12	7.25	23.50	20.75
CPB-1000G10 (2)	1000	19.25	28.00	1.50	3.53	7.63	24.75	22.00

16 GA STAINLESS AND 3/16" PTFE

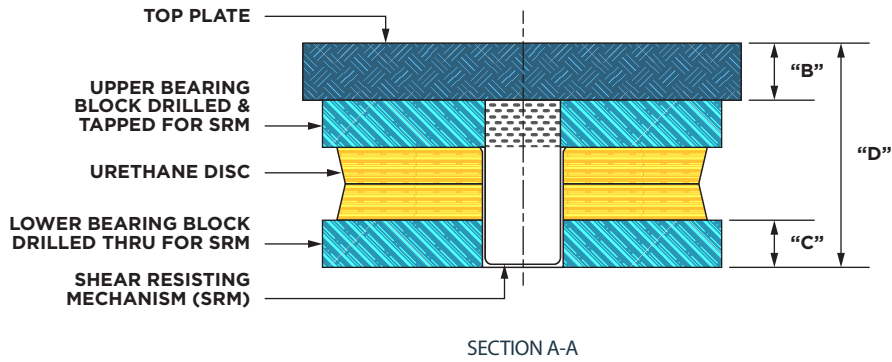
11 GA STAINLESS AND 3/16" PTFE

Type	Vert Ld (K)	Pot I.D.	A TOP W	B	C	D	E TOP L	F BASE Ø
CPB-50G30 (2)	50	4.50	11.00	0.75	1.90	4.50	8.75	6.00
CPB-75G30 (2)	75	5.25	12.25	0.88	1.97	5.00	9.50	6.75
CPB-100G30 (2)	100	6.25	13.25	0.88	2.00	5.00	10.50	7.75
CPB-125G30 (2)	125	6.75	14.50	1.00	2.18	5.63	11.25	8.50
CPB-150G30 (2)	150	7.50	15.50	1.13	2.20	6.00	12.00	9.25
CPB-200G30 (2)	200	8.75	17.50	1.25	2.38	6.38	13.50	10.75
CPB-250G30 (2)	250	9.75	19.00	1.25	2.56	6.88	14.75	12.00
CPB-300G30 (2)	300	10.50	20.50	1.38	2.73	7.38	15.75	13.00
CPB-350G30 (2)	350	11.50	21.75	1.50	3.14	7.88	17.00	14.25
CPB-400G30 (2)	400	12.25	23.25	1.63	3.31	8.50	18.00	15.25
CPB-450G30 (2)	450	13.00	24.25	1.63	3.35	8.75	18.75	16.00
CPB-500G30 (2)	500	13.50	25.25	1.75	3.51	9.00	19.50	16.75
CPB-600G30 (2)	600	15.00	27.25	1.88	3.70	9.63	21.25	18.50
CPB-700G30 (2)	700	16.00	29.25	2.00	4.32	10.50	22.75	20.00
CPB-800G30 (2)	800	17.25	31.00	2.13	4.50	11.13	24.25	21.50
CPB-900G30 (2)	900	18.25	32.75	2.25	4.68	11.63	25.50	22.75
CPB-1000G30 (2)	1000	19.25	34.50	2.25	5.32	12.25	27.00	24.25

FIXED
DISC BEARING



PLAN VIEW
FIXED DISC BEARING



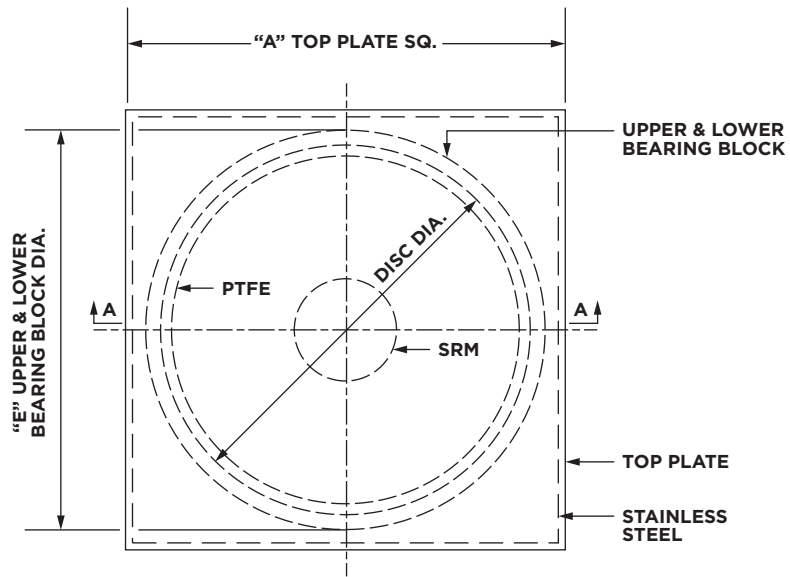
SECTION A-A

Specify: CDB-50F

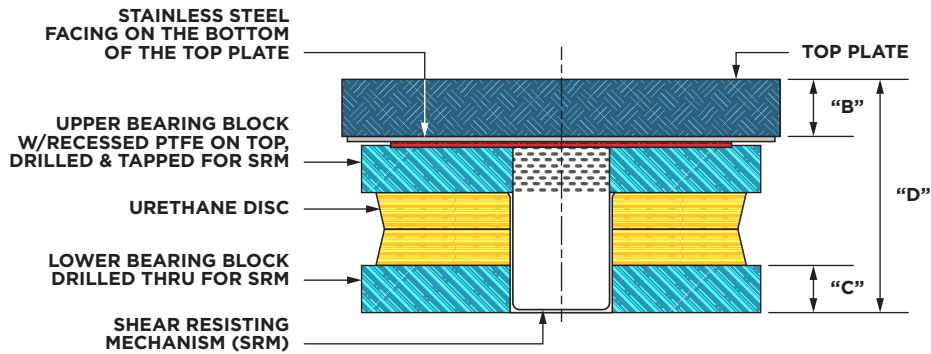
Fixed Moving Type
Vertical Capacity (K)
CON-SLIDE™ Disc Bearing

Type	Vert Ld (K)	DISC O.D.	A	B	C	D	E (∅)
CDB-50F	50	5.25	8.25	0.75	1.00	3.50	6.25
CDB-75F	75	5.75	8.75	0.75	1.00	3.50	6.75
CDB-100F	100	6.00	9.00	0.75	1.00	3.50	7.00
CDB-125F	125	6.88	10.00	0.75	1.00	3.63	8.00
CDB-150F	150	7.13	10.25	0.75	1.13	3.75	8.25
CDB-200F	200	7.63	10.75	0.75	1.13	3.75	8.75
CDB-250F	250	8.75	11.75	0.75	1.25	4.00	9.75
CDB-300F	300	9.75	12.75	0.75	1.25	4.38	10.75
CDB-350F	350	10.50	13.50	0.75	1.25	4.50	11.50
CDB-400F	400	11.50	14.50	0.75	1.25	4.63	12.50
CDB-450F	450	11.75	14.75	0.75	1.25	4.63	12.75
CDB-500F	500	12.50	15.50	0.75	1.38	4.88	13.50
CDB-600F	600	13.75	17.25	0.75	1.38	5.00	15.25
CDB-700F	700	14.75	18.25	0.75	1.38	5.13	16.25
CDB-800F	800	16.00	19.50	0.75	1.38	5.38	17.50
CDB-900F	900	16.75	20.25	0.75	1.63	5.75	18.25
CDB-1000F	1000	17.50	21.50	0.75	1.63	5.88	19.50

FREE MOVING DISC BEARING



PLAN VIEW
FREE MOVING DISC BEARING



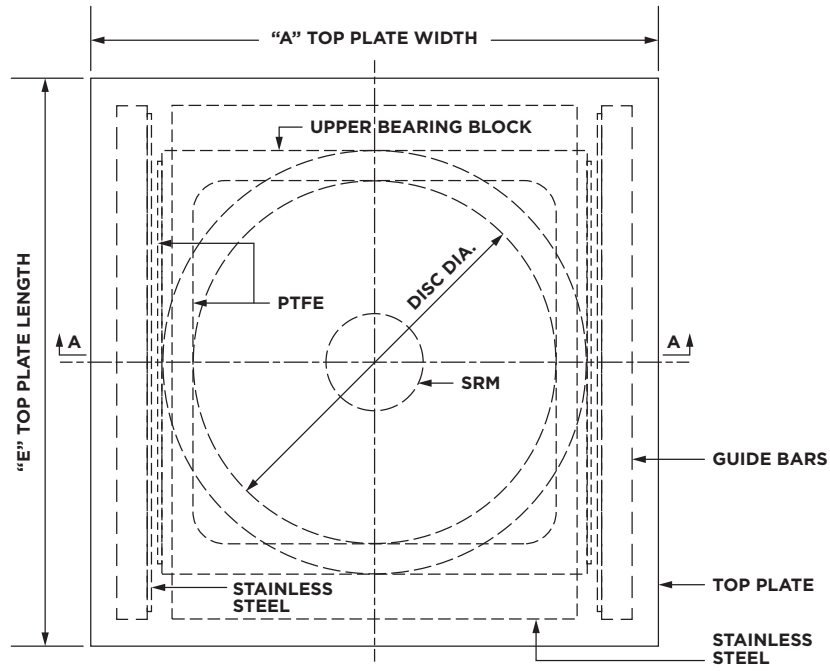
SECTION A-A

Specify: CDB-50FM
 Free Moving Type
 Vertical Capacity (K)
 CON-SLIDE™ Disc Bearing

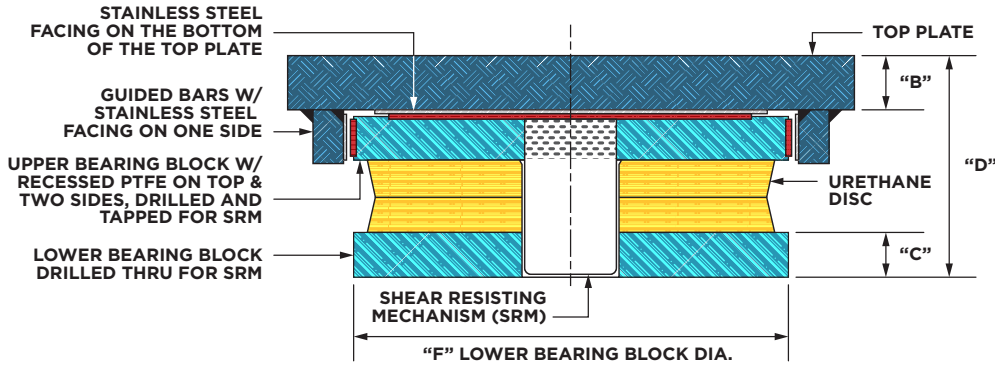
Type	Vert Ld (K)	Disc O.D.	A	B	C	D	E (Ø)
CDB-50FM (2)	50	5.25	8.25	0.75	1.00	3.66	6.25
CDB-75FM (2)	75	5.75	8.75	0.75	1.00	3.66	6.75
CDB-100FM (2)	100	6.00	9.00	0.75	1.00	3.66	7.00
CDB-125FM (2)	125	6.88	10.00	0.75	1.00	3.78	8.00
CDB-150FM (2)	150	7.13	10.50	0.75	1.13	3.91	8.50
CDB-200FM (2)	200	8.25	11.75	0.75	1.25	4.22	9.75
CDB-250FM (2)	250	8.75	13.00	0.75	1.25	4.22	11.00
CDB-300FM (2)	300	9.75	14.00	0.75	1.25	4.59	12.00
CDB-350FM (2)	350	10.50	14.75	0.75	1.25	4.72	12.75
CDB-400FM (2)	400	11.50	15.50	0.75	1.25	4.84	13.50
CDB-450FM (2)	450	11.75	16.25	0.75	1.25	4.84	14.25
CDB-500FM (2)	500	12.50	17.00	0.75	1.38	5.09	15.00
CDB-600FM (2)	600	13.75	18.50	0.75	1.38	5.22	16.50
CDB-700FM (2)	700	14.75	19.75	0.75	1.38	5.34	17.75
CDB-800FM (2)	800	16.00	21.00	0.75	1.38	5.59	19.00
CDB-900FM (2)	900	16.75	22.00	0.75	1.63	5.97	20.00
CDB-1000FM (2)	1000	17.50	23.25	0.75	1.63	6.09	21.25



OUTSIDE GUIDED DISC BEARING



PLAN VIEW
OUTSIDE GUIDED DISC BEARING



SECTION A-A

Specify: CDB-50G10

10% Lateral Load
Guided Type
Vertical Capacity (K)
CON-SLIDE™ Disc Bearing

Specify: CDB-50G30

30% Lateral Load
Guided Type
Vertical Capacity (K)
CON-SLIDE™ Disc Bearing

Type	Vert Ld (K)	DISC O.D.	A TOPW	B	C	D	E TOP L	F BASEØ
CDB-50G10 (2)	50	5.25	10.25	0.75	1.00	3.66	8.50	6.25
CDB-75G10 (2)	75	5.75	10.75	0.75	1.00	3.66	9.00	6.75
CDB-100G10 (2)	100	6.00	11.00	0.75	1.00	3.66	9.25	7.00
CDB-125G10 (2)	125	6.88	12.00	0.75	1.00	3.78	10.25	8.00
CDB-150G10 (2)	150	7.13	12.25	0.88	1.13	4.03	10.50	8.25
CDB-200G10 (2)	200	8.25	13.50	0.88	1.25	4.53	11.50	9.25
CDB-250G10 (2)	250	8.75	14.25	1.00	1.25	4.66	12.00	9.75
CDB-300G10 (2)	300	9.75	15.25	1.00	1.25	4.84	13.00	10.75
CDB-350G10 (2)	350	10.50	16.25	1.13	1.25	5.34	13.75	11.50
CDB-400G10 (2)	400	11.50	17.50	1.13	1.25	5.47	14.75	12.50
CDB-450G10 (2)	450	11.75	17.75	1.13	1.25	5.47	15.00	12.75
CDB-500G10 (2)	500	12.50	18.75	1.25	1.38	6.09	15.75	13.50
CDB-600G10 (2)	600	13.75	20.50	1.25	1.38	6.22	17.50	15.25
CDB-700G10 (2)	700	14.75	21.75	1.25	1.38	6.34	18.50	16.25
CDB-800G10 (2)	800	16.00	23.25	1.38	1.38	6.84	19.75	17.50
CDB-900G10 (2)	900	16.75	24.00	1.38	1.63	7.22	20.50	18.25
CDB-1000G10 (2)	1000	17.50	25.25	1.38	1.63	7.22	21.75	19.50

16 GA STAINLESS AND 3/16" PTFE
11 GA STAINLESS AND 3/16" PTFE

Type	Vert Ld (K)	DISC O.D.	A TOPW	B	C	D	E TOP L	F BASEØ
CDB-50G30 (2)	50	5.25	10.75	0.75	1.00	3.91	8.50	6.25
CDB-75G30 (2)	75	5.75	11.75	0.75	1.00	4.16	9.00	6.75
CDB-100G30 (2)	100	6.13	12.75	0.88	1.00	4.53	9.50	7.25
CDB-125G30 (2)	125	6.88	13.75	1.00	1.00	5.03	10.25	8.00
CDB-150G30 (2)	150	7.25	14.50	1.13	1.13	5.53	10.50	8.25
CDB-200G30 (2)	200	8.25	16.00	1.25	1.38	6.28	11.50	9.25
CDB-250G30 (2)	250	9.25	17.75	1.25	1.38	6.72	13.00	10.75
CDB-300G30 (2)	300	9.88	19.00	1.38	1.50	7.22	13.75	11.50
CDB-350G30 (2)	350	10.75	20.00	1.38	1.63	7.72	14.50	12.25
CDB-400G30 (2)	400	11.50	21.50	1.50	1.63	7.97	15.75	13.50
CDB-450G30 (2)	450	12.38	22.50	1.50	1.75	8.22	16.75	14.50
CDB-500G30 (2)	500	12.75	23.25	1.63	1.75	8.59	17.00	14.75
CDB-600G30 (2)	600	14.13	25.50	1.63	2.00	9.22	19.00	16.75
CDB-700G30 (2)	700	15.25	27.00	1.75	2.25	9.97	20.00	17.75
CDB-800G30 (2)	800	16.25	28.75	1.75	2.50	10.59	21.25	19.00
CDB-900G30 (2)	900	17.25	30.50	1.88	2.63	11.22	22.50	20.25
CDB-1000G30 (2)	1000	18.25	31.75	2.00	2.63	11.72	23.50	21.25

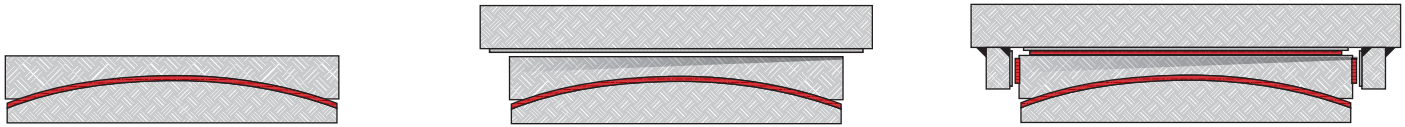
CON-SLIDE™ RADIAL/SPHERICAL BEARINGS

CON-SERV can supply customer-designed bearings or can design and supply radial or spherical bearings to customer requirements.

Slide surfaces shall consist of stainless steel and bronze or PTFE Fiber.

For design work, the following information is desirable to have if possible:

- Vertical Load
- Lateral Load (if any)
- Rotation
- Total Movement (if any)
- Type of Connection to Structure
- Type of Material
- Temperature



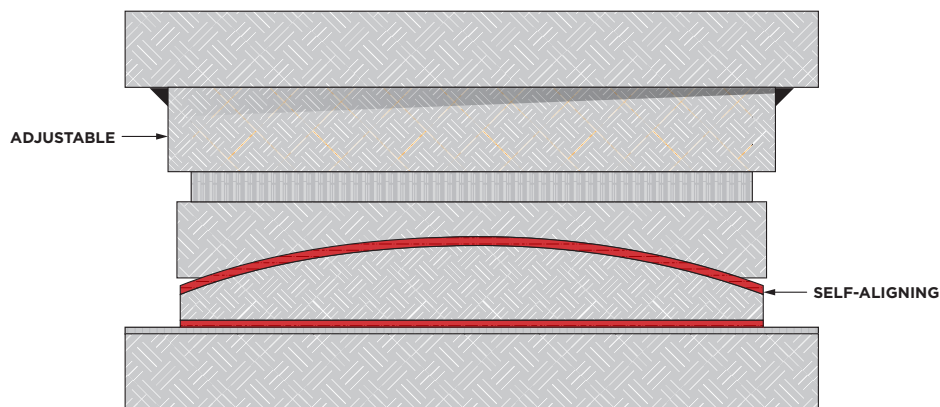
FIXED

NON-GUIDED

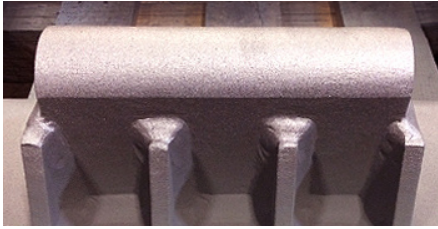
GUIDED

CON-SLIDE™ SELF-ALIGNING/ADJUSTABLE BEARINGS

CON-SLIDE™ self-aligning/adjustable bearings help meet tolerances of elevation and alignment, thereby eliminating the need for field shimming and expensive machining. Also, these bearings accommodate slight differences in elevation during erection, allow for field adjustment, and compensate for the differential settling of steel and concrete structures.



CON-SERV INC: QUALITY PRODUCTS



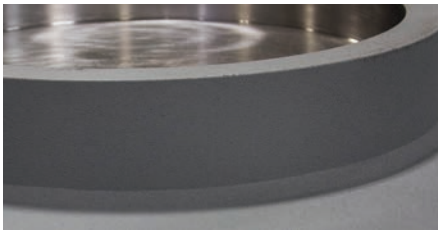
FABRICATING TO SPECIFICATIONS

At Con-Serv, fit and finish matter. Our in-house Quality Control System ensures the highest finished product quality. Our Quality Control System has been accepted by many major engineering and construction firms in the United States. These include Walter P. Moore, Jacobs Engineering, Fluor, Wood Group, Black & Veatch, Stone & Webster, TechnipFMC and AECOM.



IN-HOUSE SPRAY PAINT BOOTH

Our in-house spray paint booth enables CON-SERV to offer your choice of quality wet coatings, heat-activated powder coatings or metallized finishes in your choice of color.



PRECISION WELDING

Experienced CON-SERV welders perform detailed MIG, TIG and STICK welding on all steels, including stainless steels. In addition, state of the art robotic welding can be performed when higher throughput is required.



PROMPT SHOP DRAWING APPROVAL

The CON-SERV Engineering Team has 35 years of experience in coordinating fast approvals of shop drawings to keep your project on schedule. CON-SERV experts will review your drawings, suggest and make any necessary design revisions, and submit them for project owner approval in a timely manner.



CRITICAL TESTING

CON-SERV offers one of the largest certified multi-functional test presses in the Eastern US:

- 5,000,000 pounds vertical compression for an unlimited period of time
- Static horizontal load of 1,250,000 pounds
- Dynamic horizontal load of 300,000 pounds
- Test results can be printed or saved to a USB
- Coefficient of friction test capabilities
- Rotation Test (Proof Load Test – squeeze bearing and hold) capabilities

All measuring equipment is calibrated annually by independent agencies. The test frame is also ASTM E4 certified up to 5,000,000 pounds (2,500 tons) for compression proof load testing.

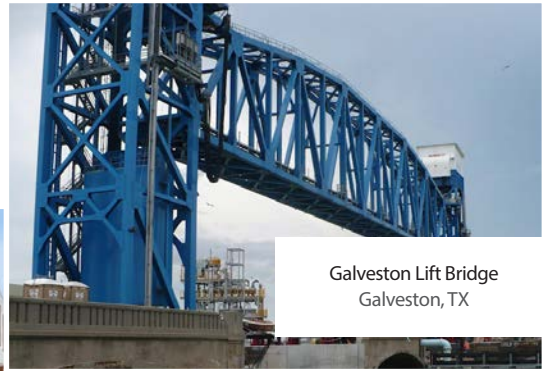
NOTABLE PROJECTS



Wynn Hotel
Las Vegas, NV



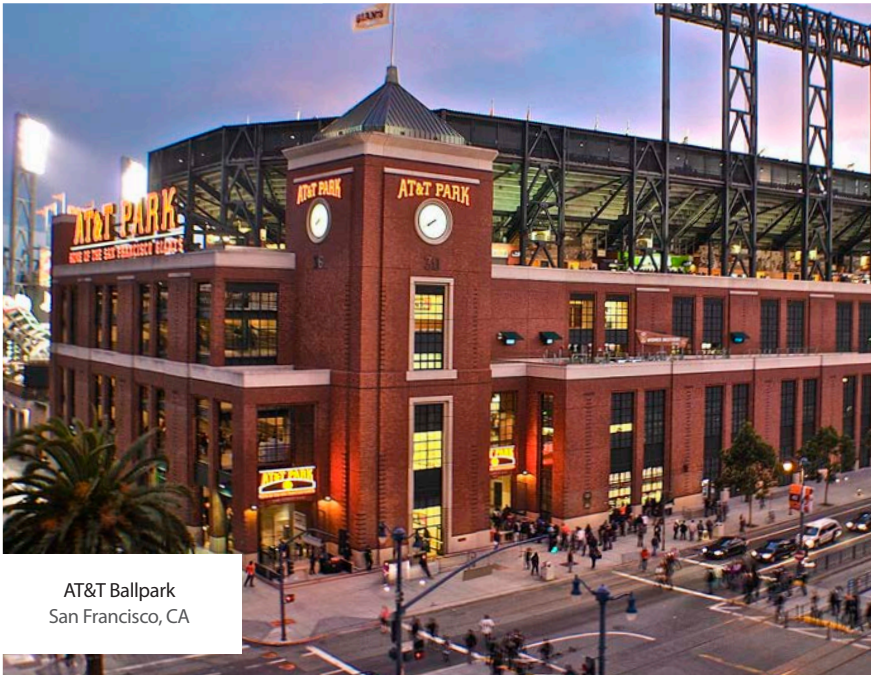
Nu Skin Center
Provo, UT



Galveston Lift Bridge
Galveston, TX



British Petroleum
Whiting, IN



AT&T Ballpark
San Francisco, CA



McCormick Place
Chicago, IL



On-Time
Shipping

SERVICE • QUALITY • ECONOMY

PHONE: 843-546-1044
FAX: 843-546-1055
EMAIL: SALES@CON-SERVINC.COM



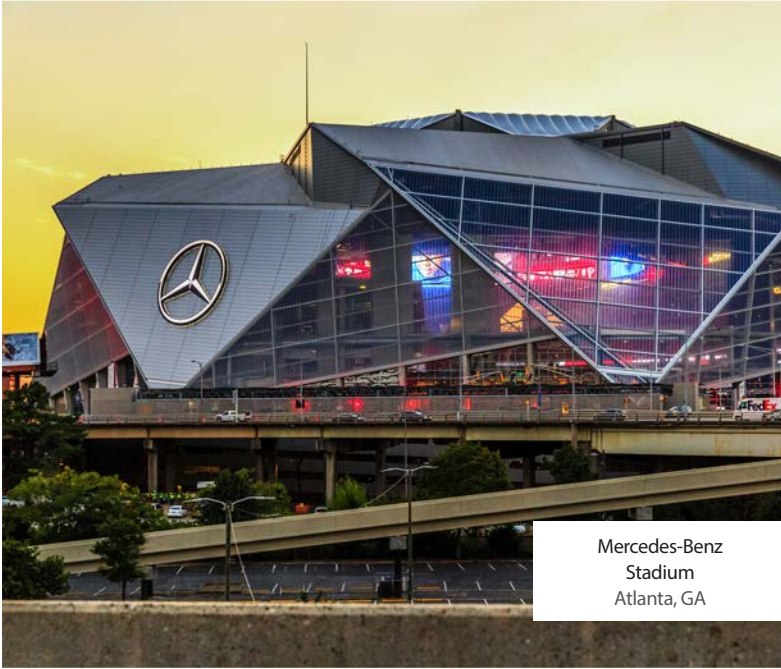
CON-SERV Georgetown, SC

CON-SERV's headquarters is located in Georgetown, SC. All administrative functions and light manufacturing are performed here.



CON-SERV Brunswick, OH

Our second manufacturing site is located near Cleveland, OH. Our heavy manufacturing, computer-controlled milling, grinding, painting and critical testing occurs here.



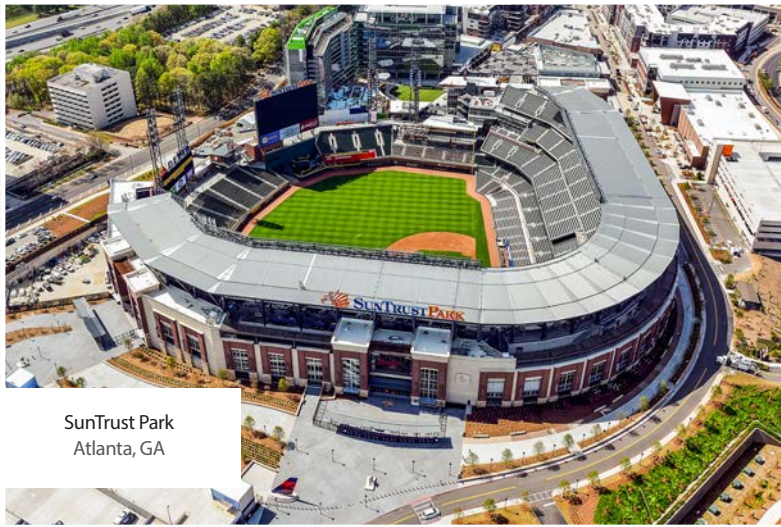
Mercedes-Benz Stadium
Atlanta, GA



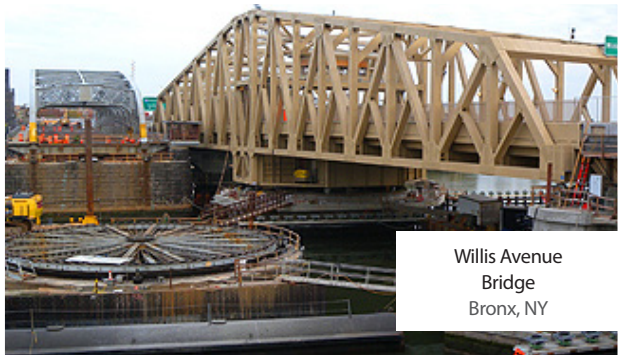
State Farm Arena
Atlanta, GA



Phoenix Airport Skytrain
Phoenix, AZ



SunTrust Park
Atlanta, GA

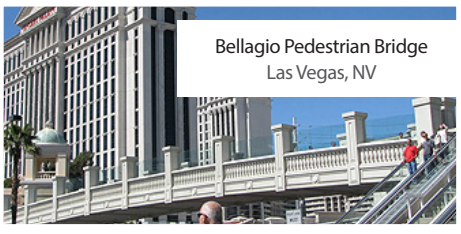


Willis Avenue Bridge
Bronx, NY

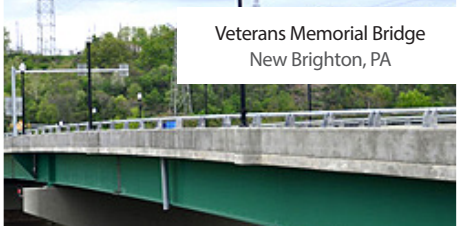
CON-SERV



Precision Tooling



Bellagio Pedestrian Bridge
Las Vegas, NV



Veterans Memorial Bridge
New Brighton, PA



CON-SERV

INC.  GEORGETOWN, SC

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