

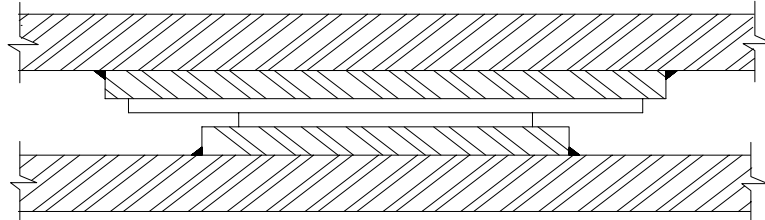


**AAA TECHNOLOGY & SPECIALTIES CO., INC.**

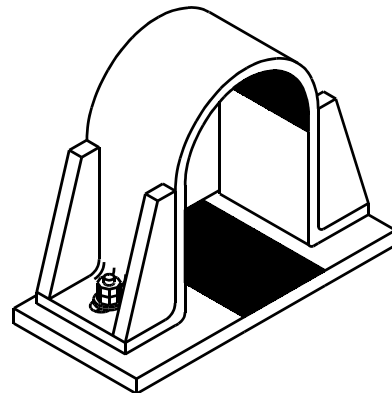
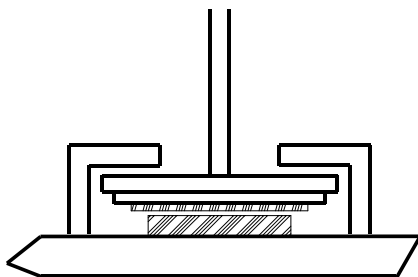
6219 Brittmoore Road ♦ Houston, Texas 77041-5114 U.S.A.

Telephone: (713) 849-3366 ♦ FAX: (713) 849-3654

E-Mail: [info@aaatech.com](mailto:info@aaatech.com) ♦ WebSite: <http://www.aaatech.com>



***TRI\*SLIDE***<sup>TM</sup>



***Low Friction Slide Bearings***

# TRI\*SLIDE™ SLIDE BEARINGS

Type TF2 and TFSS

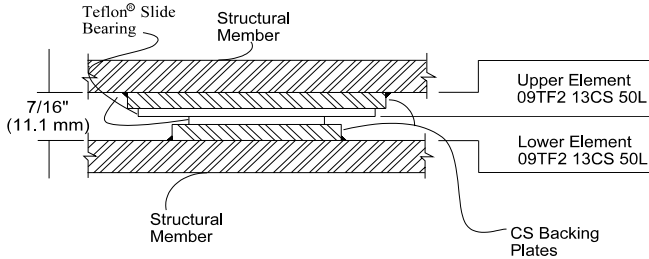
## General Specifications

TRI\*SLIDE™ slide bearings are made of glass filled Teflon® (PTFE) bonded to a steel backing plate. TRI\*SLIDE™ slide bearings are designed to reduce frictional resistance to movement at support or restraint points in piping systems and process equipment. When utilized properly, TRI\*SLIDE™ slide bearings will not show any significant wear during the expected life of the process plant.

TRI\*SLIDE™ slide bearings are available in two basic styles for normal applications as follows:

### Type TF2 (75 psi to 2,000 psi)

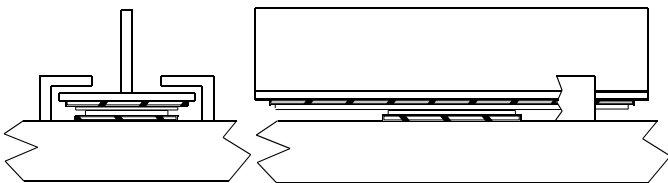
Type TF2 is designed for applications where Teflon® to Teflon® slide bearing surfaces are desired.



The Type TF2 slide bearing consists of a 3/32" thick upper and lower Teflon® slide bearing element. These slide bearing elements are typically bonded to 10 gauge carbon steel backing plates. The standard process industry practice is to make the upper element larger than the lower element by slightly more than the expected maximum movement. In fact, the practice is to insure that the bottom element is never left uncovered by the upper element.

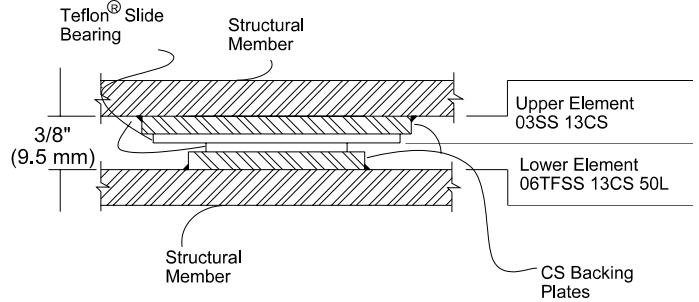
Example:

### Pipe Shoe with Teflon



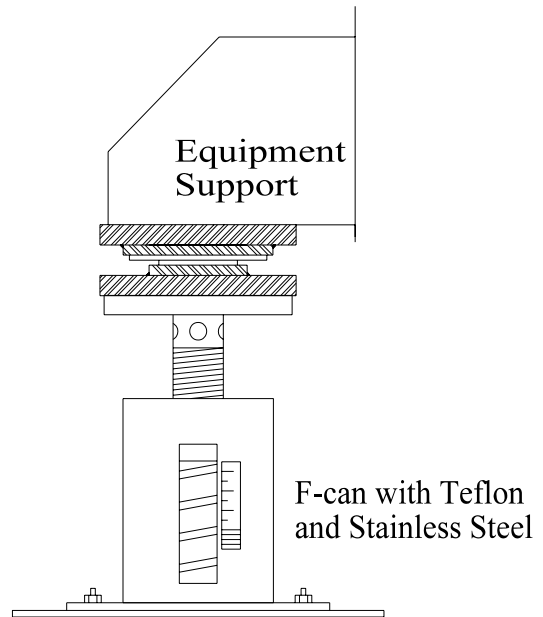
### Type TFSS (2,000 psi to 4,000 psi)

Type TFSS is designed for applications where a polished Stainless Steel plate moves across a Teflon® slide bearing.



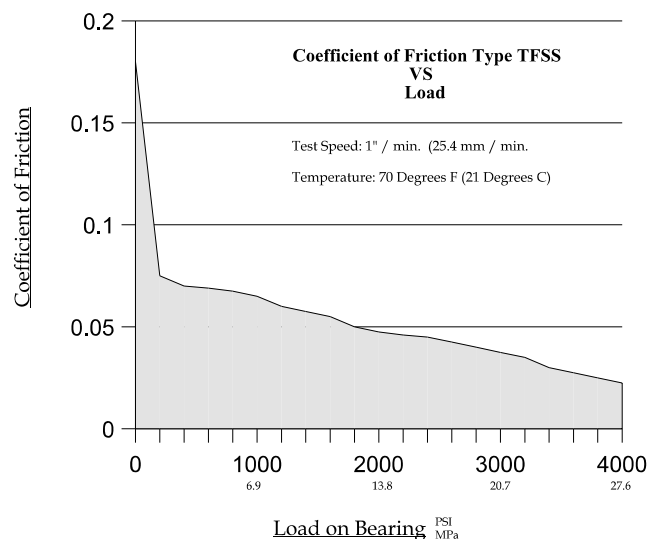
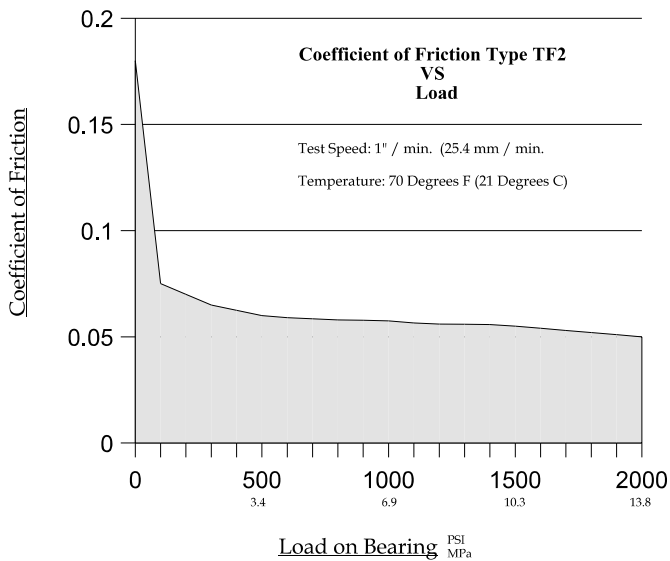
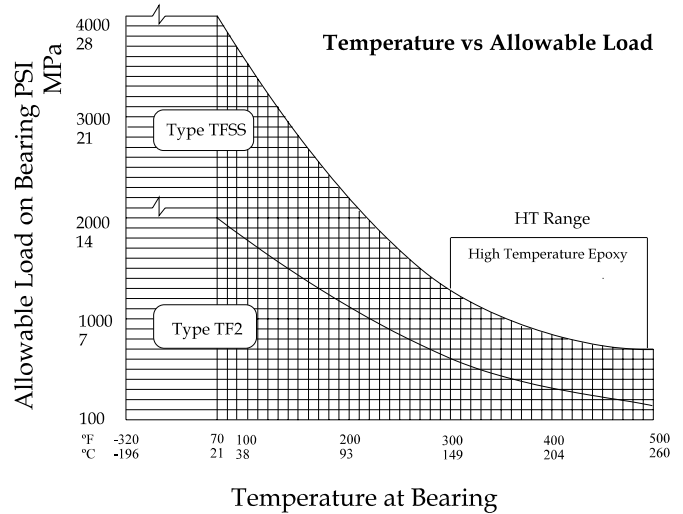
The Type TFSS slide bearing consists of an upper Stainless Steel element and a lower Teflon® element. The upper element is made of a 20 gauge Stainless Steel plate welded to a 10 gauge Carbon Steel backing plate. The lower element is made of a 1/16" thick Teflon® slide bearing element bonded to a 10 gauge carbon steel backing plate. As with Type TF2, the standard process industry practice is to make the Stainless Steel upper element larger than the lower Teflon® slide bearing element by slightly more than the expected maximum movement.

Example:



# Sizing for Loads and Movements

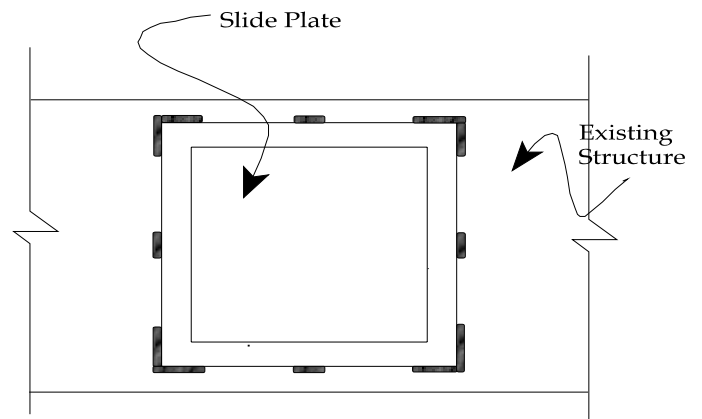
The lower element should be sized for the load and the upper element should be sized for the movement. To design the lower slide bearing element, divide the load carried by the slide bearing element by the allowable pressure given in the following "Load on Bearing" charts. For Type TF2, the allowable pressure range should be between 75 psi and 2,000 psi; for Type TFSS, the allowable pressure range should be between 2,000 psi and 4,000 psi. For example, for a Type TF2 slide bearing carrying 5,000 pounds, the size of the bearing in square inches could be  $5,000/75 = 66.67 \text{ in}^2$  or it could be  $5,000/2,000 = 2.5 \text{ in}^2$ . For Type TF2, many designers typically use between 500 psi and 1,000 psi giving a slide bearing between 10 in<sup>2</sup> and 5 in<sup>2</sup>. For Type TFSS, many designers typically use between 2,500 psi and 3,000 psi giving a slide bearing between 2 in<sup>2</sup> and 1.67 in<sup>2</sup>. Note also that as the temperature increases, the load carrying capacity of the slide bearing decreases.



To properly size the upper slide bearing element, adhere to the following procedure:

1. Start with the size you have determined to be required for the lower element.
2. To the width required for load, add two times the lateral movement expected. Then add 1" or twenty (20) percent of the lateral movement, whichever is greater.
3. To the length required for load, add two times the axial movement expected. Then add 1" or twenty (20) percent of the axial movement, whichever is greater.
4. For both the upper and lower slide bearing elements, AAA Technology recommends a backing plate with a 1/2" lip on all sides. A larger lip can be provided. A smaller lip is not recommended since the slide plates are to be welded in place and a smaller lip may lead to separation of the Teflon® from the backing plate because of the heat buildup from welding the backing plate to the structure.

## Construction Options for a TYPE TF2



## Slide Bearing

Standard TRI\*SLIDE™ slide bearing assemblies are constructed of the following:

Type TF2	Thickness	Material
Upper Slide Surface	.09"	TF2
Upper Backing Plate	10 GA = 13	Carbon Steel = CS
Lower Slide Surface	.09"	TF2
Lower Backing Plate	10 GA = 13	Carbon Steel = CS

(Note that all thicknesses are specified in hundredths of an inch)

Type TP2 TRI\*SLIDE slide bearing options are as follows:

- ▶ Slide Bearing Thickness = .06"
- ▶ Backing Plate Thicknesses = .25", .375", .5", .75" & 1"
- ▶ Backing Plate Materials = Stainless Steel (SS), Hot Dip Galvanized Carbon Steel (HDG) & Aluminum (AL)

## Construction Options for a TYPE TFSS Slide Bearing

Standard TRI\*SLIDE™ slide bearing assemblies are constructed of the following:

Type TFSS	Thickness	Material
Upper Slide Surface	.03"	Stainless Steel = SS
Upper Backing Plate	10 GA = 13	Carbon Steel = CS
Lower Slide Surface	.06"	TFSS
Lower Backing Plate	10 GA = 13	Carbon Steel = CS

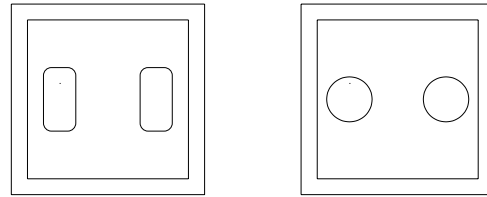
(Note that all thicknesses are specified in hundredths of an inch)

Type TPSS TRI\*SLIDE slide bearing options are as follows:

- ▶ Upper Slide Bearing Thickness = .06" SS
- ▶ Lower Slide Bearing - other thicknesses of TFSS may be specified as well as any desired thickness of Virgin PTFE
- ▶ Backing Plate Thicknesses = .25", .375", .5", .75" & 1"
- ▶ Backing Plate Materials = Stainless Steel (SS), Hot Dip Galvanized Carbon Steel (HDG) & Aluminum (AL)

## Additional Construction Options

- ▶ **Holes and Slots** - If slide bearings are specified at bolted connections, then bolts typically pass through the slide bearings. One slide bearing, typically the upper, will be slotted to allow for movement along the axis of the slots. The other slide bearing will have holes in it to fix the bearing in place while the other slide bearing moves over it.
- ▶ **Studs or Anchors** - If studs or anchors are to be welded to the backing plate, specify a backing plate thickness equal to at least the diameter of the stud or anchor.
- ▶ **High Temperature** - If the surface temperature at the point of the slide bearing exceeds 300 degrees F, a high temperature epoxy will be used.



Examples of Slots & Holes

## How to Specify Type TF2 TRI\*SLIDE™ Slide Bearings

Specify the following items to describe the slide bearings desired:

1. Customer Tag Number (Identifier)
2. Type "TF2"
3. Define the Upper Element Properties
  - a. Element - Upper
  - b. Slide Bearing Thickness
  - c. Backing Plate Thickness
  - d. Backing Plate Material
  - e. Width of the Lip
  - f. Out to Out dimensions in inches of the Backing Plate
4. Define the Lower Element Properties
  - a. Element - Lower
  - b. Slide Bearing Thickness
  - c. Backing Plate Thickness
  - d. Backing Plate Material
  - e. Width of the Lip
  - f. Out to Out dimensions in inches of the Backing Plate
5. Specify HT if the high temperature epoxy is required
6. Describe any Holes and Slots required, if any - Tagged sketches should be attached to clarify hole and slot locations and sizes
7. Describe the Studs or Anchors required, if any - Tagged sketches should be attached to clarify stud and anchor sizes and locations

For example:

- Tag #1, Type TF2
- U, 09, 13, CS, 50, 9" x 9"
- L, 09, 13, CS, 50, 6" x 6"

## How to Specify Type TFSS TRI\*SLIDE™ Slide Bearings

Specify the following items to describe the slide bearings desired:

1. Tag Number (Identifier)
2. Type "TFSS"
3. Define the Upper Element Properties
  - a. Element - Upper
  - b. Slide Bearing Thickness
  - c. Backing Plate Thickness
  - d. Backing Plate Material
  - e. Out to Out dimensions in inches of the Backing Plate

4. Define the Lower Element Properties
  - a. Element - Lower
  - b. Slide Bearing Thickness
  - c. Backing Plate Thickness
  - d. Backing Plate Material
  - e. Width of the Lip
  - f. Out to Out dimensions in inches of the Backing Plate
5. Specify HT if the high temperature epoxy is required
6. Specify Virgin PTFE, if required
7. Describe any Holes and Slots required, if any - Tagged sketches should be attached to clarify hole and slot locations and sizes
8. Describe the Studs or Anchors required, if any - Tagged sketches should be attached to clarify stud and anchor sizes and locations

For example:

- Tag #2, Type TFSS
- U, 03, 13, CS, 10" by 10"
- L, 06, 13, CS, 50, 6" by 6"

## Physical Properties of TRI\*SLIDE™ Slide Bearings

### ◆ Type TF2 Slide Bearings

Type TF2 slide bearings are virgin (unreprocessed) PTFE resin, tested in accordance with the ASTM D1457 Standard, and with reinforcing agents added. Such reinforcing agents include milled glass fibers. Type TF2 slide bearings exhibit the following average mechanical and physical properties:

*Specific Gravity: 2.17 to 2.22*  
*Tensile Strength: 2,200 psi*  
*Elongation: 225%*

Exact values for the mechanical and physical properties of each lot of Type TF2 are available upon request. Statements of certification for the Epoxy and the TF2 slide bearings as well as MTR's for the steel components are available upon request.

### ◆ Type TFSS Slide Bearings

Type TFSS slide bearings are virgin (unreprocessed) PTFE resin, tested in accordance with the ASTM D1457 Standard, and with reinforcing agents added. Such reinforcing agents include milled glass fibers. Type TFSS slide bearings exhibit the following average mechanical and physical properties:

*Specific Gravity: 2.14 to 2.21*  
*Tensile Strength: 3,500 psi*  
*Elongation: 300%*

Exact values for the mechanical and physical properties of each lot of Type TFSS are available upon request. Statements of certification for the Epoxy and the TFSS slide bearings as well as MTR's for the steel components are available upon request.

### ◆ Coefficient of Friction

The coefficients of friction shown in the charts in this document are the maximum values after the initiation of first movement. The coefficients of friction do not vary significantly with variations in temperature. As the speed of movement increases, the coefficients of friction will also increase. For a speed of movement of ten (10) inches per minute, the coefficients of friction will increase approximately forty-five (45) percent.

### ◆ Strength of Epoxy Bonding

The epoxy compound used has been specifically formulated for bonding Type TF2 and TFSS TRI\*SLIDE™ slide bearings. It has been extensively tested and proven to function as designed. The bonding strength between the PTFE element and the backing plate exceeds the required strength by 500 percent. These strength values are also attained for TRI\*SLIDE™ slide bearings subjected to temperatures of between 300 and 500 degrees F when "HT" slide bearings are specified.

### ◆ Wear

When TRI\*SLIDE™ slide bearings are utilized in typical thermal expansion applications in process or power plants, negligible wear is found to occur. In extreme climates where temperatures may reach -70 degrees F, TRI\*SLIDE™ slide bearings have functioned as designed with negligible wear.

### ◆ Ultraviolet Testing

Time accelerated tests have been conducted to determine the effects of ultraviolet rays on Type TF2 and TFSS slide bearings and no ill effects of any significance have been found. Once TRI\*SLIDE™ slide bearings have been installed, the PTFE elements are protected from ultraviolet rays for the most part by the steel backing plates as well as other near-by steel and equipment in the process or power plant.

### ◆ Installation of TRI\*SLIDE Slide Bearings

Type TF2 TRI\*SLIDE™ slide bearings consists of two (2) PTFE bearings bonded to backing plates with a lip all the way around the PTFE bearings. With a 1/2" wide lip, the steel backing plate can be stitch welded or seal welded as desired.

Where Type TF2 TRI\*SLIDE™ slide bearings without a "Lip" are being installed, extreme care is to be taken to not exceed the 300 degree limit during stitch welding. A maximum weld of 1" for every 6" of bearing edge is to be applied.

When excessive heat is applied to the steel, epoxy and PTFE during welding, the steel and the PTFE will separate. Whenever possible, Type TF2 TRI\*SLIDE™ slide bearings without a "Lip" should be installed using mechanical attachments or bonding with an appropriate epoxy. Contact AAA Technology for such recommendations.

In all installations where the backing plate is welded to a structural member to attach the slide bearing, the bearing slide surfaces must be protected from weld splatter as well as all foreign matter that would scratch or gall the slide surfaces. While awaiting installation, the PTFE surfaces should be stored where they are not exposed for prolonged periods to the direct rays of the sun. All PTFE surfaces and Stainless Slide surfaces should have a protective covering until installation is completed.

**Recommended Installation Procedure for a TRI\*SLIDE Type TF2 Slide Bearing** - A typical TRI\*SLIDE™ TF2 slide bearing will be supplied with a smaller bearing pad for use as the lower element and a larger bearing pad for use as the upper element.

1. The lower element should be installed first.
2. The PTFE bearing should be covered with a material that will protect it from weld splatter during installation.
3. Once the PTFE bearing is properly protected, the backing plate on the lower element should be stitch welded. If the bearing plate is to be seal welded, use the skip and fill technique. The temperature of the steel, epoxy and PTFE during welding is not to exceed 300 degrees F. If "HT" slide bearings are being installed, the temperature of the steel, epoxy and bearing plate during welding is not to exceed 500 degrees F.
4. After the lower element has been installed, completely cover the PTFE on the upper slide bearing and the lower slide bearing.
5. Once the PTFE bearing is properly protected, the backing plate on the upper element should be stitch welded. If the bearing plate is to be seal welded, use the skip and fill technique. The temperature of the steel, epoxy and PTFE during welding is not to exceed 300 degrees F. If

"HT" slide bearings are being installed, the temperature of the steel, epoxy and bearing plate during welding is not to exceed 500 degrees F.

6. After welding or other installation methods are concluded, the protective covering must be removed from the PTFE surfaces to allow for the desired movement to occur.

**Recommended Installation Procedure for a TRI\*SLIDE Type TFSS Slide Bearing** - A typical TRI\*SLIDE™ TFSS slide bearing will be supplied with a smaller bearing pad for use as the lower element and a larger Stainless Steel bearing pad for use as the upper element.

1. The lower element should be installed first.
2. The PTFE bearing should be covered with a material that will protect it from weld splatter during installation.
3. Once the PTFE bearing is properly protected, the backing plate on the lower element should be stitch welded. If the bearing plate is to be seal welded, use the skip and fill technique. The temperature of the steel, epoxy and PTFE during welding is not to exceed 300 degrees F. If "HT" slide bearings are being installed, the temperature of the steel, epoxy and bearing plate during welding is not to exceed 500 degrees F.
4. After the lower element has been installed, completely cover the PTFE on the lower slide bearing and the Stainless Steel upper slide bearing.
5. Once the slide bearing surfaces are properly protected, the backing plate on the upper Stainless Steel slide bearing should be stitch welded. The Stainless Steel slide bearing may be seal welded, if desired.
6. After welding or other installation methods are concluded, the protective covering must be removed from the PTFE surface and the Stainless Steel slide bearing surface to allow for the desired movement to occur.

FAX, mail, courier or E-Mail your requirements to us for a complimentary price and delivery quotation. We at AAA Technology welcome an opportunity to serve you!



## **AAA TECHNOLOGY & SPECIALTIES CO., INC.**

6219 Brittmoore Road ♦ Houston, Texas 77041-5114 U.S.A.

Telephone: (713) 849-3366 ♦ FAX: (713) 849-3654

E-Mail: [info@aaatech.com](mailto:info@aaatech.com) ♦ WebSite: <http://www.aaatech.com>