

Swivel Joints



The Right Connection™

Safety

Dixon's swivel joints are designed to give years of dependable service for their intended use. The proper selection of a swivel joint for a particular application is of the utmost importance. Users must consider the size, temperature, application, media, and the total weight supported by the swivel joint. Dixon recommends that each swivel joint be inspected and properly maintained on a regular basis. Dixon also recommends that swivel joints be tested each time they are reassembled. If any problem is detected, the swivel joint should be removed from service immediately. Dixon is available to consult, train and recommend the proper swivel joint for a given application. Dixon strongly recommends that distributors and end users utilize Dixon's technical staff to answer any questions. Dixon can be contacted at 800-355-1991.

SAFETY
ALERT

This Safety Alert logo, which appears throughout our catalog, is used as a reminder that the user should carefully review for safety the appropriateness of the product for the media, application and environment in which it will be used.

Features and Benefits

- Full 360° rotational movement offers maximum flexibility
- Wide spacing between dual ball bearing raceways ensures greater load-bearing capacity
- Precision-machined design ensures alignment and years of trouble-free service
- An O-ring dust seal protects the ball races and seal chamber from outside elements.
- The radius elbow design ensures a smooth flow pattern

*All weights and dimensions are approximate and subject to change without notice.
Consult the factory when critical.*

Color Coding System for Seal Identification:

BU Buna-N - red stripe
VI Viton® - green stripe
TF PTFE - natural
EP Ethylene Propylene - green and white stripes

Swivel Styles

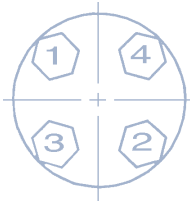
O Ring Style Swivels

- The O-ring pressure seal ensures a leak-proof seal and smoother rotation at lower torques than multiple designs.
- Spring-loaded PTFE pressure seals are available through 3"
- Carbon steel and stainless steel O-ring type swivels provide greater strength and corrosion resistance when needed for lower torque applications

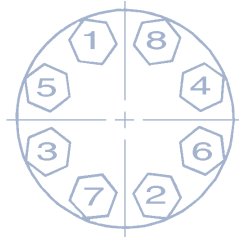
V Ring Style Swivels

- The spring-loaded triple V-ring sealing system ensures a leak-proof seal and an extended seal life compared to the conventional single O-ring design.
- The 3" - 8" carbon steel swivels are manufactured from carbon steel with flame hardened dual raceways for greater load bearing capacity and longer life.
- Stainless steel swivels are manufactured in 316 grade stainless steel for superior corrosion resistance.

Flange Bolt Tightening Sequence (use appropriate gaskets and bolts)



4 Bolt



8 Bolt



12 Bolt

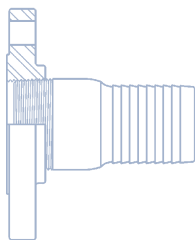
Dimensions of 150 lb. ASA Steel Flanges

| Nominal Pipe Size | Flange O.D. | Thickness * | O.D. of Raised Face | Diameter of Bolt Circle | Number of Bolts | Diameter of Bolt Holes | Diameter of Bolts |
|-------------------|-------------|-------------|---------------------|-------------------------|-----------------|------------------------|-------------------|
| 1" | 4-1/2" | 9/16" | 2" | 3-1/8" | 4 | 5/8" | 1/2" |
| 1-1/2" | 5" | 11/16" | 2-7/8" | 3-7/8" | 4 | 5/8" | 1/2" |
| 2" | 6" | 3/4" | 3-5/8" | 4-3/4" | 4 | 3/4" | 5/8" |
| 2-1/2" | 7" | 7/8" | 4-1/8" | 5-1/2" | 4 | 3/4" | 5/8" |
| 3" | 7-1/2" | 15/16" | 5" | 6" | 4 | 3/4" | 5/8" |
| 4" | 9" | 15/16" | 6-3/16" | 7-1/2" | 8 | 3/4" | 5/8" |
| 5" | 10" | 15/16" | 7-5/16" | 8-1/2" | 8 | 7/8" | 3/4" |
| 6" | 11" | 1" | 8-1/2" | 9-1/2" | 8 | 7/8" | 3/4" |
| 8" | 13-1/2" | 1-1/8" | 10-5/8" | 11-3/4" | 8 | 7/8" | 3/4" |
| 10" | 16" | 1-3/16" | 12-3/4" | 14-1/4" | 12 | 1" | 7/8" |
| 12" | 19" | 1-1/4" | 15" | 17" | 12 | 1" | 7/8" |

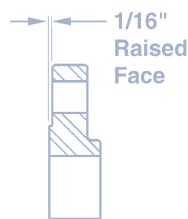
* 1/16" raised face is included in the thickness

Flange Diagrams

Threaded Applications

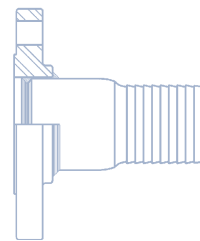


threaded flange with raised face

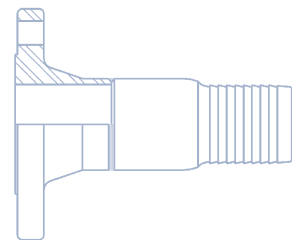


1/16"
Raised Face

Welded Applications



slip-on flange with raised face



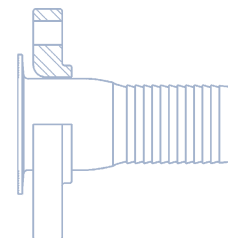
weld neck flange with raised face

Floating Applications

(flange free to swivel)



slip-on flange with raised face



lap-joint flange

Operation / Service

Dixon swivels are recommended for use at the following **maximum** Non-Shock Cold Working Pressures (NSCWP) provided in **PSI**, at ambient temperatures (70°F)

| | (V-Ring) Carbon Steel CS | (O-Ring) Carbon Steel OC | (V-Ring) Stainless Steel SS | (O-Ring) Stainless Steel OS | Aluminum AL | Brass BR | Malleable Iron MI |
|-----|---------------------------------------|---------------------------------------|---|---|-----------------------|--------------------|-----------------------------|
| 1" | --- | 1000 | --- | 1000 | 150 | --- | --- |
| 1¼" | --- | --- | --- | --- | 150 | --- | --- |
| 1½" | --- | 1000 | --- | 1000 | 150 | 300 | 600 |
| 2" | 1000 | 1000 | 1000 | 1000 | 150 | 300 | 600 |
| 3" | 1000 | 1000 | 1000 | 1000 | 150 | 300 | 600 |
| 4" | 1000 | --- | 1000 | --- | 150 | --- | --- |
| 6" | 1000 | --- | --- | --- | 150 | --- | --- |
| 8" | --- | --- | --- | --- | 150 | --- | --- |

- When using flanged ends, the pressure rating will be reduced to coincide with that of the flange being used. **Carbon steel and stainless steel 150# flanges are recommended for use at 275 maximum PSI at ambient temperature (70°F).**
- Lubrication should be performed periodically, depending on service and operation conditions. Twice yearly is normally sufficient.
- All dimensions are approximate. Where critical, consult the factory.

Options Available:

- Any combination of end configurations
- Alternative seal materials: Viton®, PTFE, Ethylene Propylene and FDA Buna
- Alternative ball bearing materials: 440 stainless steel and 316 stainless steel
- Alternative grease materials: FDA approved/food grade and silicone
- Drain holes or counter balance lugs
- Swivels for oxygen service, steam service and submerged service can be specifically designed for unique applications (special order)

Use with Hose

The use of swivel joints to compensate for twist in hose (i.e. Style 20 or Style 60) should be carefully reviewed, since **the hose must be sufficiently stiff to generate the torque needed to actuate the swivel before it kinks.**

In many installations, the twist is caused by lateral movement that can be eliminated by the use of a swivel joint that addresses the lateral movement (i.e. Style 40 or Style 30).

Where this is not possible, the use of hose swivels may be a solution. Hose swivels are generally non-ball bearing designs that require less torque to initiate rotation; however, hose swivels are not designed for load bearing service.

Some hoses are unable to generate even the low torque required for a hose swivel, many metal hoses fall into this group. Other hoses are stiff enough to turn almost any swivel, many armored hoses fall into this group.

Pricing

All pricing available upon request. Please contact factory for pricing and proper equipment selection for the correct application.

Every swivel joint is built to order, due to this, they are not generally returnable. Return requests will be reviewed on a case by case basis. Restocking charges will be applicable on all returns. Restocking charges include 15%, plus any additional costs incurred.

Ordering Information - Swivels

To select the proper swivel joint you need the following information:

Size: _____ Style (shape): _____

End Configuration: _____ Material: _____

Maximum Working Pressure: _____ Temperature Range: _____

Product being handled: (if a chemical, please advise concentration) _____

If for constant rotation, advise RPM: _____

If for suction service, advise maximum vacuum in inches of Mercury (Hg): _____

Our factory sales and engineering staff will be happy to help you evaluate your swivel application. Please call 800.355.1991.

| | | | | | | | | | | | |
|----------------|--------------------|---------------------|--------------------------|----------|--------------------------|------------------------|--|--|------------------------------------|--|-----------------|
| | <i>swivel size</i> | <i>swivel style</i> | <i>end configuration</i> | | <i>end configuration</i> | <i>swivel material</i> | <i>pressure seal (Buna-N standard)</i> | <i>dust seal (Buna-N standard)</i> | <i>retainers (V-Ring ONLY)</i> | <i>ball bearings (carbon steel standard)</i> | <i>grease</i> |
| Example | 2 [A] | 20 [B] | F [C] | X | F [C] | CS [D] | 0 [E] | 0 [F] | 1 [G] | 0 [H] | 0 [I] |

[A] Size

[B] Style (see diagrams)

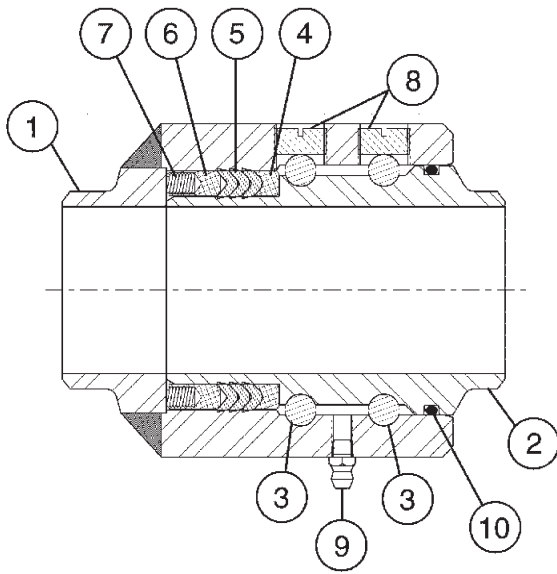
| | | | | | |
|---------------------|------------------------------------|---------------------------------------|------------------------------|--------------------------------|---|
| [C] End Connections | W Weld End | F Female End | FG 150# ASA Flange | TF Tank Truck Flange | PF 300# ASA flange (not available on aluminum) |
| [D] Material | CS (V-Ring) carbon steel | SS (V-Ring) stainless steel | AL aluminum | BR brass | MI malleable iron |
| | OC (O-Ring) carbon steel | OS (O-Ring) stainless steel | | | |

| Code # | [E] Pressure Seal | [F] Dust Seal | [G] Retainers | [H] Ball Bearings | [I] Grease |
|----------|--|--|-------------------------------------|----------------------------|---------------------------------------|
| 0 | Buna-N (standard) | Buna-N (standard) | No retainers (O-ring swivels) | Carbon steel (standard) | Standard |
| 1 | Viton® | Viton® | Aluminum (standard in CS V-ring) | 440 grade stainless | FDA approved/ Food grade |
| 2 | PTFE | --- | PTFE (standard in SS V-ring) | 316 grade stainless | Silicone (required with EPR seals) |
| 3 | Ethylene Propylene (requires silicone grease) | Ethylene Propylene (requires silicone grease) | --- | --- | --- |
| 4 | FDA Buna (O-ring only) | FDA Buna | --- | --- | --- |

The swivel should be packed so that the surfaces coming in contact with the fluid being handled are compatible with that fluid. *In the case of the use of the swivel in submerged service this would include the dust seals and ball bearings.*

Dixon always recommends the use of stainless steel ball bearings when building a swivel for submerged service since the standard carbon steel bearings could rust together making it impossible to disassemble the swivel and possibly affecting its operation.

V-ring Parts Identification List



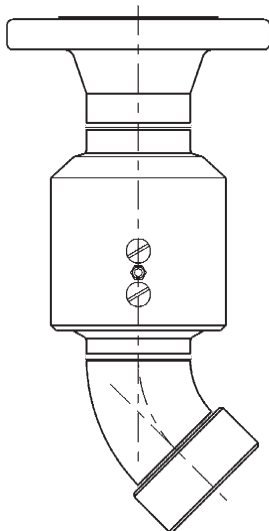
weld end shown

1. body
2. sleeve
3. ball bearings
4. seal retainer
5. V-ring (pressure) seal
6. spring retainer
7. spring
8. ball retainer screw
9. grease fitting
10. O-ring (dust) seal

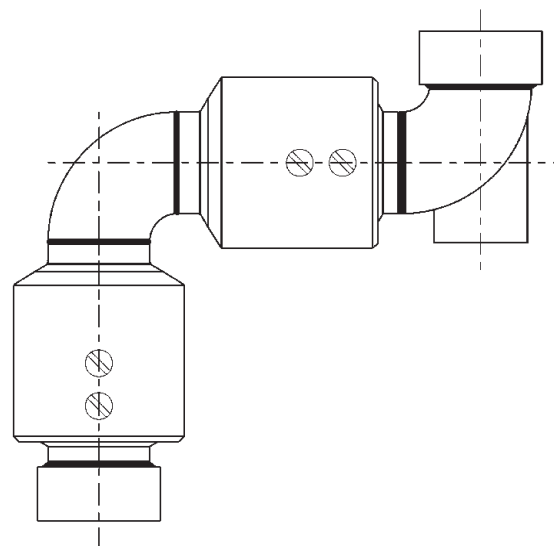
Other available end configurations:

- Male NPT thread
- 300# ASA flange
- Tank car thread with gasket
- TTMA tank truck flange
- British pipe thread

Special Options



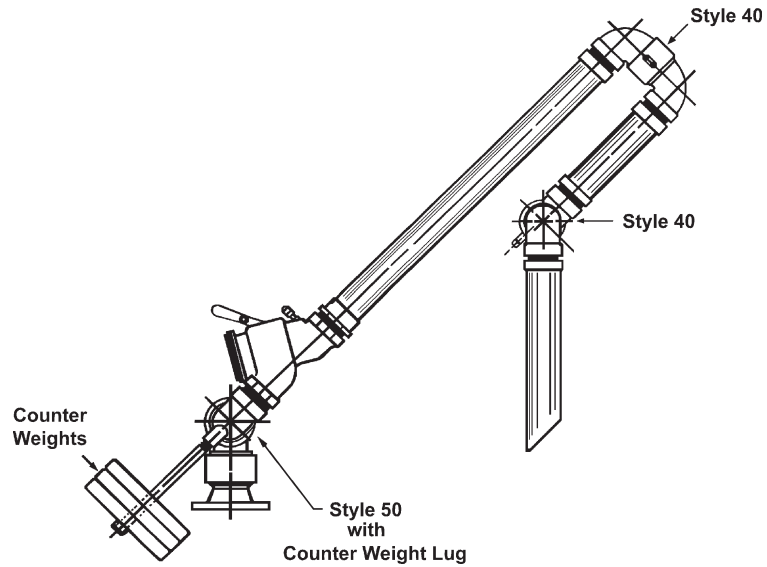
45° Swivel assembly
(style 30 shown)



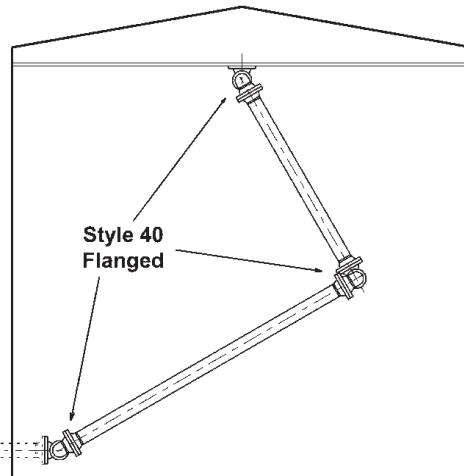
Swivel assembly with counterweight lug
(style 50 shown)

Typical V-ring Swivel Applications

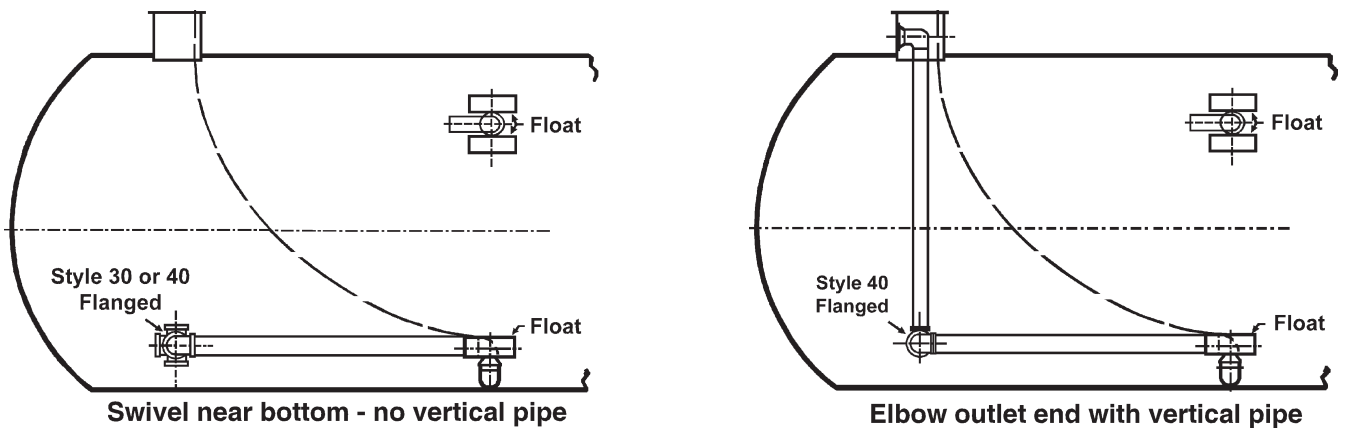
Loading Arm



Floating Roof Drain

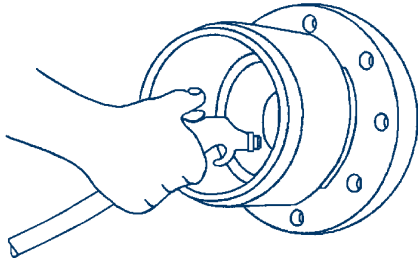


Floating Suction

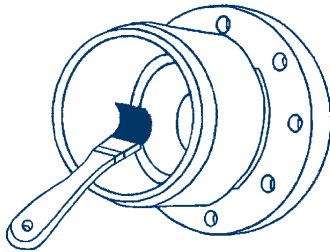


V-ring Swivel Joints

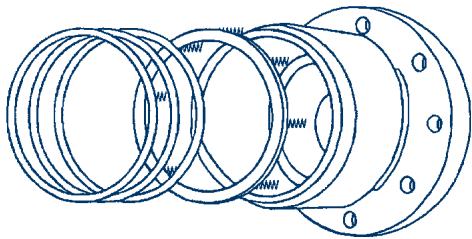
V-ring Swivel Seal Replacement Procedure



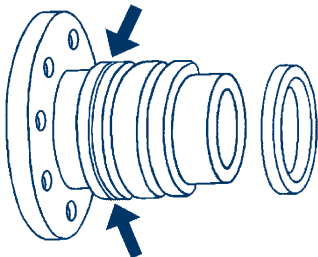
1 Remove the ball retainer screws. Add a sufficient amount of solvent into each raceway to flush out the lubricant. Rotate the sleeve, catching the balls as they fall out. When all the balls have been removed, the body and sleeve can be separated. Discard old seals. Thoroughly clean the body, sleeve retainer, spring retainer and springs. *



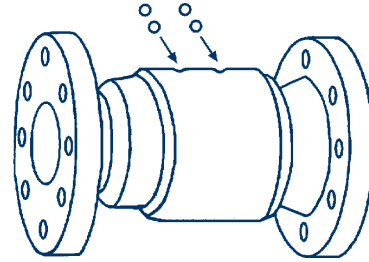
2 Lubricate the body unit with a Moly lubricant or equivalent.



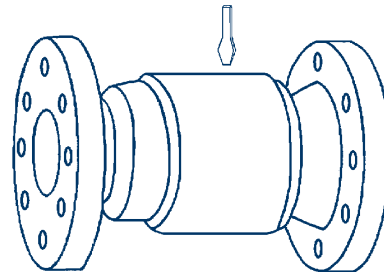
3 Place the assembled spring retainer unit (spring end first) into the body. Place the set of V rings onto the spring retainer. Be sure V rings are installed with the sealing lips facing toward the retainer. Lubricate the body and seals with a Moly lubricant or equivalent.



4 Set the dust seal into O ring groove on the sleeve. Place the seal retainer on the sleeve with the grooved end facing the V rings. Lubricate the sleeve with grease.



5 Insert sleeve into body, compressing swivel joint together until ball races of body and sleeve are in alignment (do not rotate either unit while compressing). Care should be taken to avoid pinching or scoring of V rings. Drop balls into raceway holes, rotating the sleeve slowly as you load. To make space for all the balls, insert a screw driver into the raceway while continuing to rotate the sleeve in one direction (be careful not to damage the threads). This will cause the balls to jam up, making room for the remaining balls. Now reverse the rotation of the sleeve and insert the remaining balls.



6 Reinstall ball retainer screws until tight. If this interferes with the smooth rotation of the ball bearings, then back off 1/8 - 1/4 turn. A thread locking sealant is recommended to prevent screws from backing off. After pressure testing, the unit is ready for installation.

* The last coil of the springs has been upset (OD slightly larger). When upset end is inserted into the holes provided in the spring retainer, the springs remain secure.

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Caution:

Body and sleeve are matched during manufacturing. Do not mix components with other units.

Optional Seals for V-Ring Swivels

V-Ring - Pressure Seals

- V-Ring pressure seal material; Viton®, PTFE (SS), PTFE (CS and AL) which includes changing to PTFE retainers, EPR and Buna-N. Buna-N is standard.
- V-Ring pressure seals are available in 2", 3", 4", 6" and 8"

O-Ring - Dust Seals

- Dust seal material: Viton®, EPR and Buna-N. Buna-N is standard.
- O-Ring dust seals are available in 2", 3", 4", 6" and 8"
- Carbon steel V-ring swivels come standard with aluminum retainers. These must be compatible with the material flowing through the swivel. PTFE retainers are available.

Rebuild Kits for V-Ring Swivels

V-Ring Swivel Rebuild Kit - each kit contains 3 V-rings in the material indicated, 1 Buna-N dust seal, 2 ball retainer screws, 1 grease plug and 10 ball bearings. The spring retainer and seal retainer *are not included* in the V-ring swivel rebuild kits.

| Size | Buna | Viton® | PTFE | EPR |
|------|---------------|---------------|---------------|---------------|
| 2" | <i>2RKVBU</i> | <i>2RKVVI</i> | <i>2RKVTF</i> | <i>2RKVEP</i> |
| 3" | <i>3RKVBU</i> | <i>3RKVVI</i> | <i>3RKVTF</i> | <i>3RKVEP</i> |
| 4" | <i>4RKVBU</i> | <i>4RKVVI</i> | <i>4RKVTF</i> | <i>4RKVEP</i> |
| 6" | <i>6RKVBU</i> | <i>6RKVVI</i> | <i>6RKVTF</i> | <i>6RKVEP</i> |
| 8" | <i>8RKVBU</i> | <i>8RKVVI</i> | <i>8RKVTF</i> | <i>8RKVEP</i> |

Note: All rebuild kits are per plane of rotation

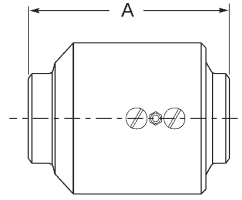
Optional Ball Bearings for V-Ring Swivels

- material: 440 stainless steel or 316 stainless steel
- ball bearings are available in 2", 3", 4", 6" and 8"

Replacement Ball Bearings for V-Ring Swivels

| Size | Qty Per Plane of Rotation | Carbon Steel (standard) | 440 Stainless Steel | 316 Stainless Steel |
|------|------------------------------|----------------------------|---------------------|---------------------|
| | | <i>Part #</i> | <i>Part #</i> | <i>Part #</i> |
| 2" | 50 | <i>38CSBA</i> | <i>38SSBA</i> | <i>38SSBA-316</i> |
| 3" | 62 | <i>38CSBA</i> | <i>38SSBA</i> | <i>38SSBA-316</i> |
| 4" | 84 | <i>38CSBA</i> | <i>38SSBA</i> | <i>38SSBA-316</i> |
| 6" | 96 | <i>12CSBA</i> | <i>12SSBA</i> | <i>12SSBA-316</i> |
| 8" | 84 | <i>34CSBA</i> | <i>34SSBA</i> | <i>34SSBA-316</i> |

Single Plane V - Ring Style 20 Weld end x Weld end



| Size | Part # | Material | Weight (lbs) | Dimensions (inches) A |
|------|---------------|----------------------|--------------|--------------------------|
| 2" | <i>220WXW</i> | CS - carbon steel | 9.2 | 5-5/16" |
| | | SS - stainless steel | 9.2 | |
| 3" | <i>320WXW</i> | CS - carbon steel | 12.9 | 5-3/4" |
| | | SS - stainless steel | 13.1 | |
| 4" | <i>420WXW</i> | CS - carbon steel | 24.4 | 7" |
| | | SS - stainless steel | 25.1 | |
| 6" | <i>620WXW</i> | CS - carbon steel | 54.5 | 8-3/8" |
| | | SS - stainless steel | 56.5 | |
| | | AL - aluminum | 21.6 | |
| 8" | <i>820WXW</i> | CS - carbon steel | 78.3 | 8-5/8" |
| | | SS - stainless steel | 92.3 | |
| | | AL - aluminum | 35.3 | |



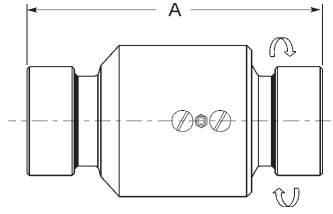
Caution:

Weld end swivel joints should be completely disassembled prior to welding, so as not to damage the seals. Care should be taken to avoid distortion of seal and ball race diameters.

Swivels are shipped standard with the following components:

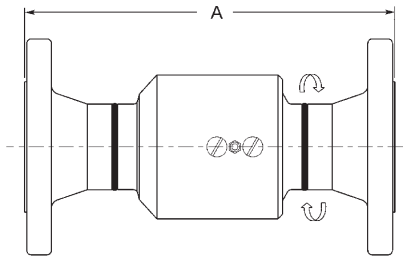
- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Single Plane V - Ring Style 20 Female NPT x Female NPT



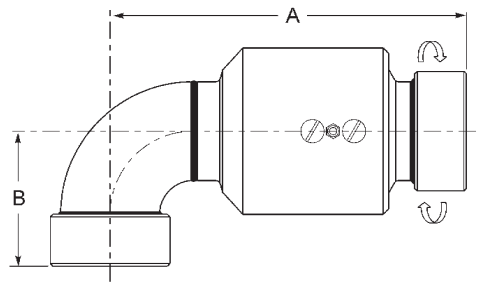
| Size | Part # | Material | Weight (lbs) | Dimensions (inches) A |
|------|--------|----------------------|--------------|--------------------------|
| 2" | 220FXF | CS - carbon steel | 12.7 | 8-11/16" |
| | | SS - stainless steel | 12.2 | |
| 3" | 320FXF | CS - carbon steel | 17.0 | 10" |
| | | SS - stainless steel | 18.4 | |
| 4" | 420FXF | CS - carbon steel | 36.7 | 11-3/4" |
| | | SS - stainless steel | 37.7 | |
| 6" | 620FXF | CS - carbon steel | 67.5 | 12-1/8" |
| | | SS - stainless steel | 69.5 | |
| | | AL - aluminum | 25.8 | |
| 8" | 820FXF | CS - carbon steel | --- | 12-7/8" |
| | | SS - stainless steel | --- | |
| | | AL - aluminum | --- | |

150# ASA Flange x 150# ASA Flange



| Size | Part # | Material | Weight (lbs) | Dimensions (inches) A |
|------|----------|----------------------|--------------|--------------------------|
| 2" | 220FGXFG | CS - carbon steel | 21.7 | 10-5/16" |
| | | SS - stainless steel | 21.1 | |
| 3" | 320FGXFG | CS - carbon steel | 36.0 | 11-1/4" |
| | | SS - stainless steel | 35.3 | |
| 4" | 420FGXFG | CS - carbon steel | 57.4 | 13" |
| | | SS - stainless steel | 58.1 | |
| 6" | 620FGXFG | CS - carbon steel | 104.2 | 15-3/8" |
| | | SS - stainless steel | 106.2 | |
| | | AL - aluminum | 39.0 | |
| 8" | 820FGXFG | CS - carbon steel | 162.3 | 16-5/8" |
| | | SS - stainless steel | 170.3 | |
| | | AL - aluminum | 61.0 | |

Single Plane V - Ring Style 30 Female NPT x Female NPT

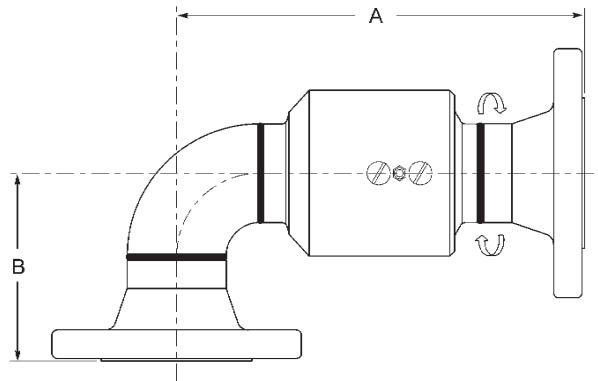


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | |
|------|--------|----------------------|--------------|---------------------|----------|
| | | | | A | B |
| 2" | 230FXF | CS - carbon steel | 12.1 | 9" | 3-11/16" |
| | | SS - stainless steel | 12.1 | | |
| 3" | 330FXF | CS - carbon steel | 20.6 | 10-7/8" | 5-1/8" |
| | | SS - stainless steel | 21.3 | | |
| 4" | 430FXF | CS - carbon steel | 42.4 | 13-3/8" | 6-3/8" |
| | | SS - stainless steel | 44.4 | | |
| 6" | 630FXF | CS - carbon steel | 84.3 | 16-1/4" | 7-7/8" |
| | | SS - stainless steel | 84.2 | | |
| | | AL - aluminum | 31.5 | | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Single Plane V - Ring Style 30 10# ASA Flange x 150# ASA Flange

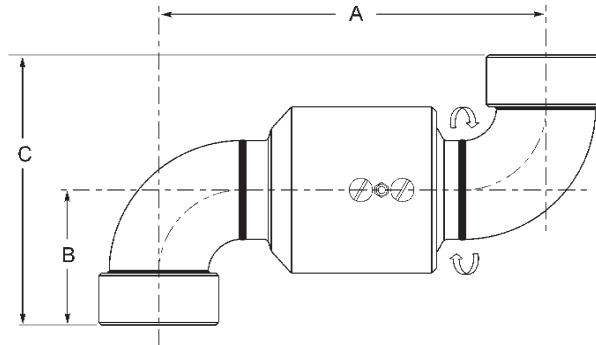


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | |
|------|----------|----------------------|--------------|---------------------|--------|
| | | | | A | B |
| 2" | 230FGXFG | CS - carbon steel | 22.7 | 9-13/16" | 4-1/2" |
| | | SS - stainless steel | 22.1 | | |
| 3" | 330FGXFG | CS - carbon steel | 39.4 | 11-1/2" | 5-3/4" |
| | | SS - stainless steel | 38.2 | | |
| 4" | 430FGXFG | CS - carbon steel | 63.6 | 14" | 7" |
| | | SS - stainless steel | 64.8 | | |
| 6" | 630FGXFG | CS - carbon steel | 121.0 | 17-7/8" | 9-1/2" |
| | | SS - stainless steel | 120.9 | | |
| | | AL - aluminum | 44.7 | | |
| 8" | 830FGXFG | CS - carbon steel | 196.3 | 20-5/8" | 12" |
| | | SS - stainless steel | 207.9 | | |
| | | AL - aluminum | 76.6 | | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Single Plane V - Ring Style 40 Female NPT x Female NPT

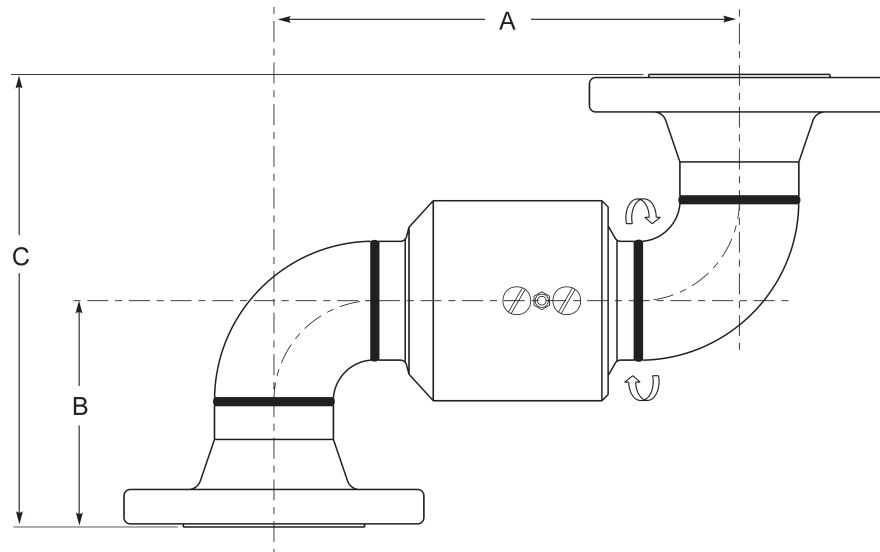


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | | |
|------|--------|----------------------|--------------|---------------------|----------|---------|
| | | | | A | B | C |
| 2" | 240FXF | CS - carbon steel | 13.1 | 9-5/16" | 3-11/16" | 7-3/8" |
| | | SS - stainless steel | 13.1 | | | |
| 3" | 340FXF | CS - carbon steel | 24.0 | 11-3/4" | 5-1/8" | 10-1/4" |
| | | SS - stainless steel | 24.2 | | | |
| 4" | 440FXF | CS - carbon steel | 48.6 | 15" | 6-3/8" | 12-3/4" |
| | | SS - stainless steel | 51.1 | | | |
| 6" | 640FXF | CS - carbon steel | 101.1 | 20-3/8" | 7-7/8" | 15-3/4" |
| | | SS - stainless steel | 98.9 | | | |
| | | AL - aluminum | 39.0 | | | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Single Plane V - Ring Style 40 150# ASA Flange x 150# ASA Flange

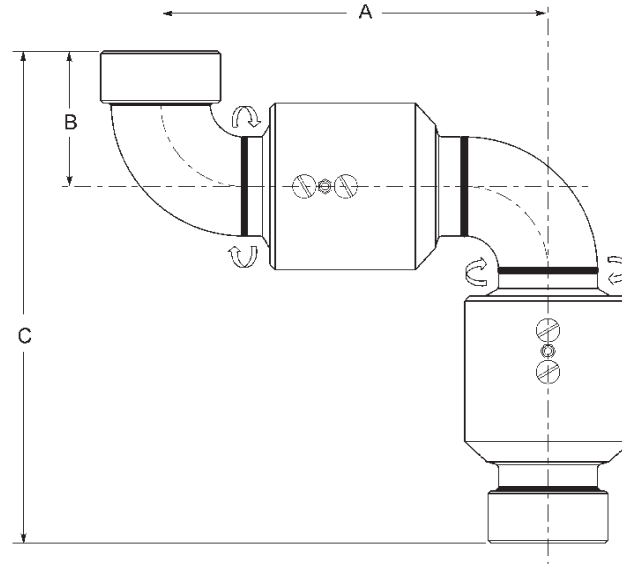


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | | |
|------|----------|----------------------|--------------|---------------------|--------|---------|
| | | | | A | B | C |
| 2" | 240FGXFG | CS - carbon steel | 23.7 | 9-5/16" | 4-1/2" | 9" |
| | | SS - stainless steel | 23.1 | | | |
| 3" | 340FGXFG | CS - carbon steel | 42.8 | 11-3/4" | 5-3/4" | 11-1/2" |
| | | SS - stainless steel | 41.1 | | | |
| 4" | 440FGXFG | CS - carbon steel | 69.8 | 15" | 7" | 14" |
| | | SS - stainless steel | 71.5 | | | |
| 6" | 640FGXFG | CS - carbon steel | 137.8 | 20-3/8" | 9-1/2" | 19" |
| | | SS - stainless steel | 135.6 | | | |
| | | AL - aluminum | 52.2 | | | |
| 8" | 840FGXFG | CS - carbon steel | 230.3 | 24-5/8" | 12" | 24" |
| | | SS - stainless steel | 245.5 | | | |
| | | AL - aluminum | 92.2 | | | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Double Plane V - Ring Style 50 Female NPT x Female NPT

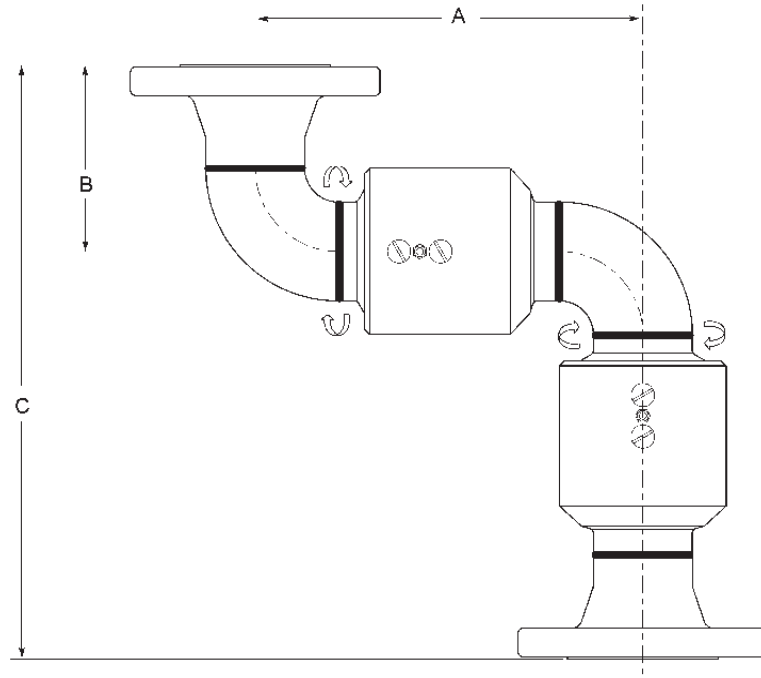


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | | |
|------|--------|----------------------|--------------|---------------------|----------|-----------|
| | | | | A | B | C |
| 2" | 250FXF | CS - carbon steel | 22.8 | 9-5/16" | 3-11/16" | 12-11/16" |
| | | SS - stainless steel | 23.3 | | | |
| 3" | 350FXF | CS - carbon steel | 36.9 | 11-3/4" | 5-1/8" | 16" |
| | | SS - stainless steel | 37.3 | | | |
| 4" | 450FXF | CS - carbon steel | 73.0 | 15" | 6-3/8" | 19-3/4" |
| | | SS - stainless steel | 76.2 | | | |
| 6" | 650FXF | CS - carbon steel | 155.6 | 20-3/8" | 7-7/8" | 24-1/8" |
| | | SS - stainless steel | --- | | | |
| | | AL - aluminum | 60.6 | | | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Double Plane V - Ring Style 50 150# ASA Flange x 150# ASA Flange

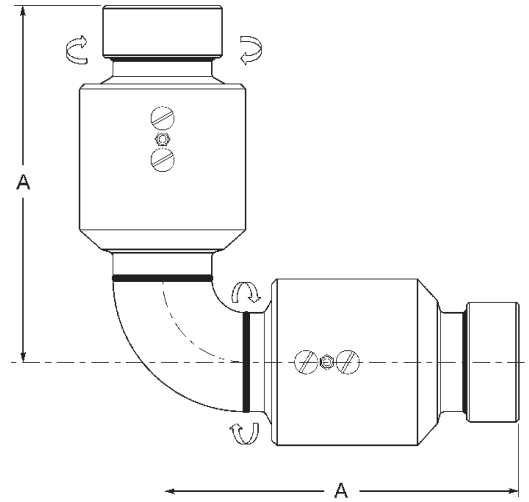


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | | |
|------|----------|----------------------|--------------|---------------------|--------|----------|
| | | | | A | B | C |
| 2" | 250FGXFG | CS - carbon steel | 32.8 | 9-5/16" | 4-1/2" | 14-5/16" |
| | | SS - stainless steel | 32.2 | | | |
| 3" | 350FGXFG | CS - carbon steel | 55.7 | 11-3/4" | 5-3/4" | 17-1/4" |
| | | SS - stainless steel | 54.3 | | | |
| 4" | 450FGXFG | CS - carbon steel | 94.2 | 15" | 7" | 21" |
| | | SS - stainless steel | 96.6 | | | |
| 6" | 650FGXFG | CS - carbon steel | 192.3 | 20-3/8" | 9-1/2" | 27-3/8" |
| | | SS - stainless steel | 192.1 | | | |
| | | AL - aluminum | 73.8 | | | |
| 8" | 850FGXFG | CS - carbon steel | 308.6 | 24-5/8" | 12" | 32-5/8" |
| | | SS - stainless steel | 337.8 | | | |
| | | AL - aluminum | 127.5 | | | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Double Plane V - Ring Style 60 Female NPT x Female NPT

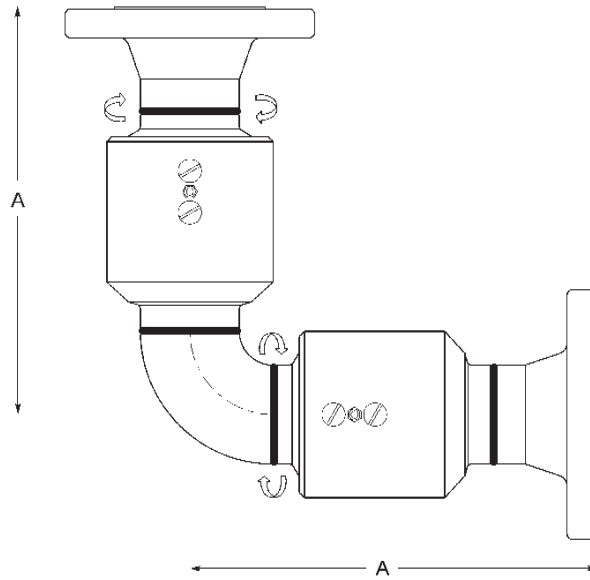


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) A |
|------|--------|----------------------|--------------|--------------------------|
| 2" | 260FXF | CS - carbon steel | 21.40 | 9" |
| | | SS - stainless steel | 21.50 | |
| 3" | 360FXF | CS - carbon steel | 34.30 | 10-7/8" |
| | | SS - stainless steel | 34.30 | |
| 4" | 460FXF | CS - carbon steel | 72.00 | 13-3/8" |
| | | SS - stainless steel | 72.00 | |
| 6" | 660FXF | CS - carbon steel | 118.00 | 16-1/4" |
| | | SS - stainless steel | --- | |
| | | AL - aluminum | --- | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Double Plane V - Ring Style 60 150# ASA Flange x 150# ASA Flange

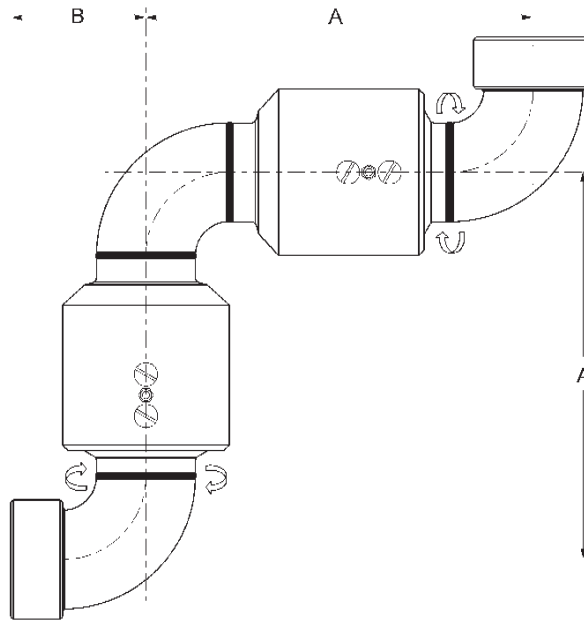


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) A |
|------|----------|----------------------|--------------|--------------------------|
| 2" | 260FGXFG | CS - carbon steel | 42.00 | 9-13/16" |
| | | SS - stainless steel | 42.00 | |
| 3" | 360FGXFG | CS - carbon steel | 83.00 | 11-1/2" |
| | | SS - stainless steel | 83.00 | |
| 4" | 460FGXFG | CS - carbon steel | 106.00 | 14" |
| | | SS - stainless steel | 106.00 | |
| 6" | 660FGXFG | CS - carbon steel | 172.00 | 17-7/8" |
| | | SS - stainless steel | 172.00 | |
| | | AL - aluminum | --- | |
| 8" | 860FGXFG | CS - carbon steel | 312.00 | 20-5/8" |
| | | SS - stainless steel | 312.00 | |
| | | AL - aluminum | --- | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Double Plane V - Ring Style 70 Female NPT x Female NPT

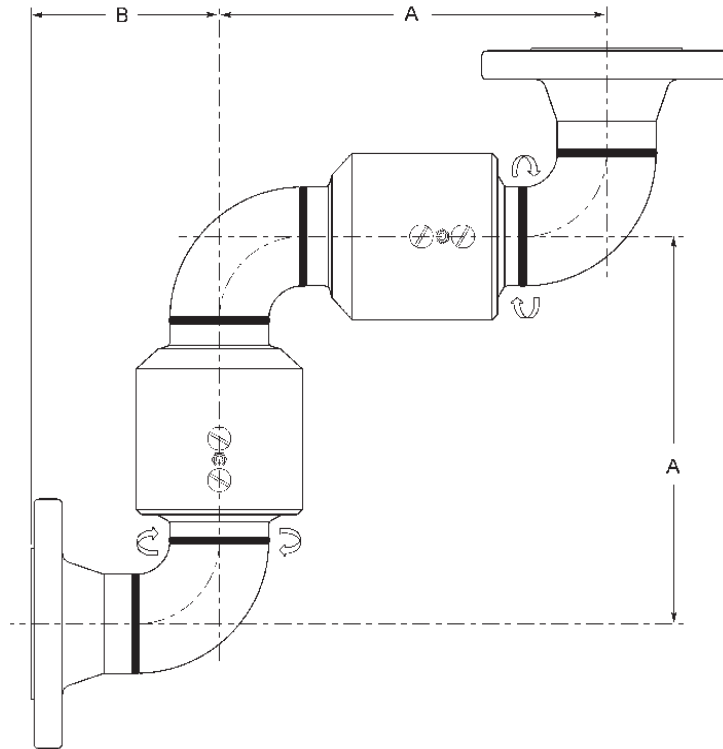


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | |
|------|--------|----------------------|--------------|---------------------|---------|
| | | | | A | B |
| 2" | 270FXF | CS - carbon steel | 23.7 | 9-5/16" | 3-11/16 |
| | | SS - stainless steel | 24.35 | | |
| 3" | 370FXF | CS - carbon steel | 40.3 | 11-3/4" | 5-1/8" |
| | | SS - stainless steel | 40.2 | | |
| 4" | 470FXF | CS - carbon steel | 79.2 | 15" | 6-3/8" |
| | | SS - stainless steel | 82.9 | | |
| 6" | 670FXF | CS - carbon steel | 172.4 | 20-3/8" | 7-7/8" |
| | | SS - stainless steel | --- | | |
| | | AL - aluminum | --- | | |

Swivels are shipped standard with the following components:

- Buna N for pressure seals and dust seals
- Carbon steel for ball bearings
- Aluminum for retainers in carbon steel swivels
- PTFE for retainers in stainless steel swivels

Double Plane V - Ring Style 70 150# ASA Flange x 150# ASA Flange

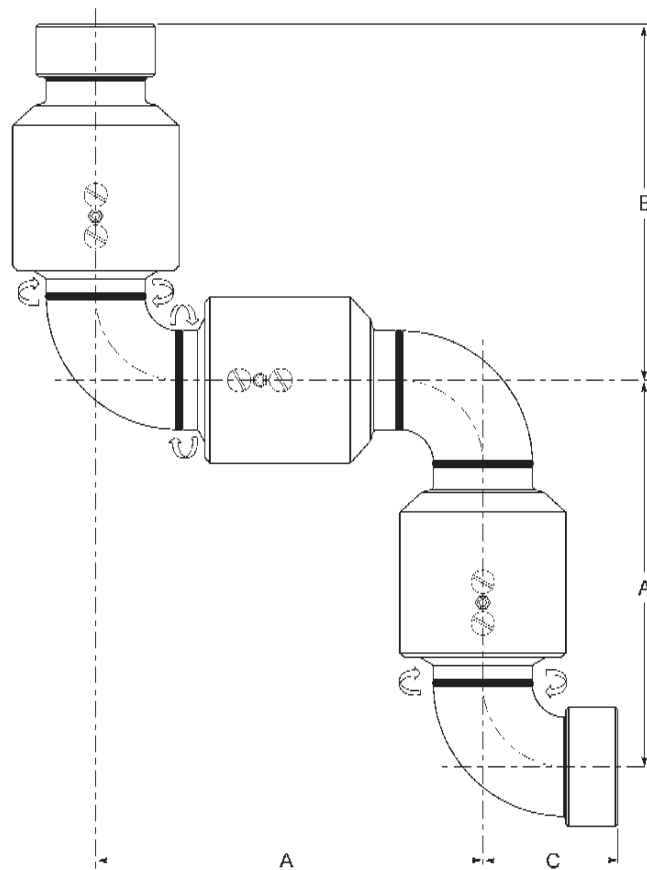


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | |
|------|----------|----------------------|--------------|---------------------|--------|
| | | | | A | B |
| 2" | 270FGXFG | CS - carbon steel | 33.8 | 9-5/16" | 4-1/2" |
| | | SS - stainless steel | 33.2 | | |
| 3" | 370FGXFG | CS - carbon steel | 59.1 | 11-3/4" | 5-3/4" |
| | | SS - stainless steel | 57.2 | | |
| 4" | 470FGXFG | CS - carbon steel | 100.4 | 15" | 7" |
| | | SS - stainless steel | 103.3 | | |
| 6" | 670FGXFG | CS - carbon steel | 209.1 | 20-3/8" | 9-1/2" |
| | | SS - stainless steel | 206.8 | | |
| | | AL - aluminum | 81.5 | | |
| 8" | 870FGXFG | CS - carbon steel | 342.6 | 24-5/8" | 12" |
| | | SS - stainless steel | 375.4 | | |
| | | AL - aluminum | 143.0 | | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Triple Plane V - Ring Style 80 Female NPT x Female NPT

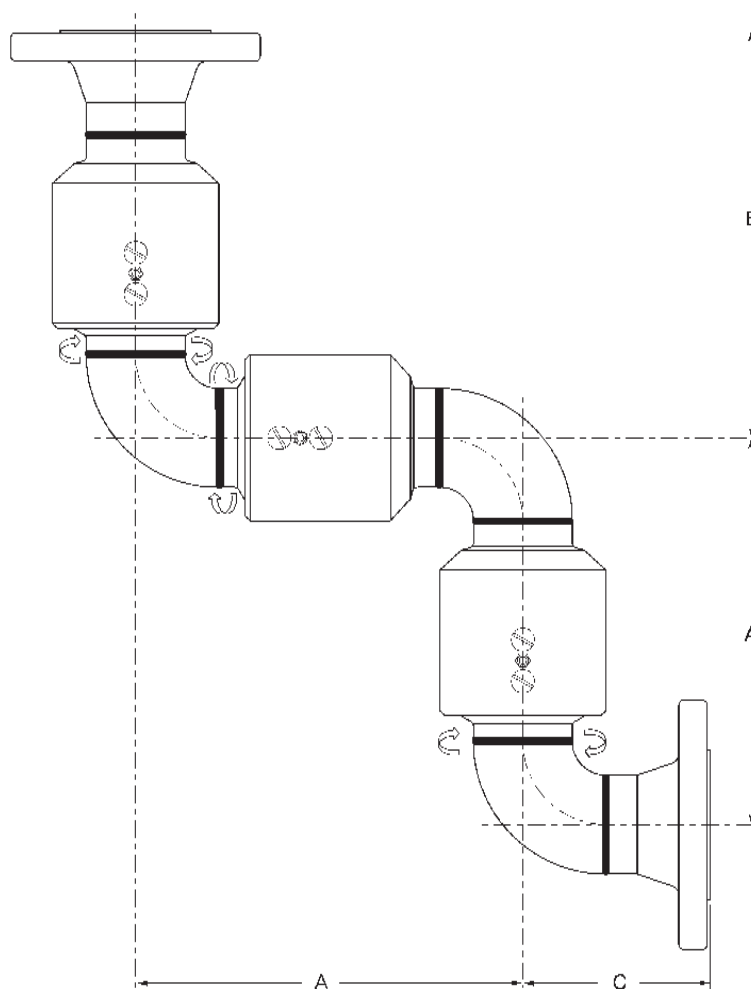


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | | |
|------|--------|----------------------|--------------|---------------------|---------|----------|
| | | | | A | B | C |
| 2" | 280FXF | CS - carbon steel | 33.0 | 9-5/16" | 9-9/16" | 3-11/16" |
| | | SS - stainless steel | 33.5 | | | |
| 3" | 380FXF | CS - carbon steel | 53.2 | 11-3/4" | 10-7/8" | 5.1/8" |
| | | SS - stainless steel | 53.3 | | | |
| 4" | 480FXF | CS - carbon steel | 103.6 | 15" | 13-3/8" | 6-3/8" |
| | | SS - stainless steel | 108.0 | | | |
| 6" | 680FXF | CS - carbon steel | 226.9 | 20-3/8" | 16-1/4" | 7-7/8" |
| | | SS - stainless steel | 226.6 | | | |
| | | AL - aluminum | --- | | | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Triple Plane V - Ring Style 80 150# ASA Flange x 150# ASA Flange

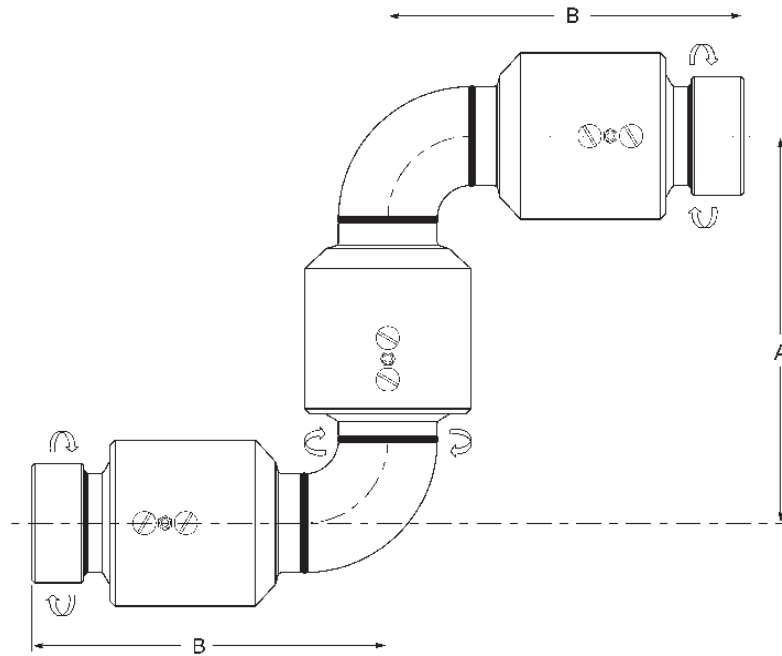


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | | |
|------|----------|----------------------|--------------|---------------------|----------|--------|
| | | | | A | B | C |
| 2" | 280FGXFG | CS - carbon steel | 43.1 | 9-5/16" | 9-13/16" | 4-1/2" |
| | | SS - stainless steel | 42.4 | | | |
| 3" | 380FGXFG | CS - carbon steel | 72.0 | 11-3/4" | 11-1/2" | 5-3/4" |
| | | SS - stainless steel | 70.3 | | | |
| 4" | 480FGXFG | CS - carbon steel | 124.8 | 15" | 14" | 7" |
| | | SS - stainless steel | 128.4 | | | |
| 6" | 680FGXFG | CS - carbon steel | 263.6 | 20-3/8" | 17-7/8" | 9-1/2" |
| | | SS - stainless steel | 263.3 | | | |
| | | AL - aluminum | 102.2 | | | |
| 8" | 880FGXFG | CS - carbon steel | 420.9 | 24-5/8" | 20-5/8" | 12" |
| | | SS - stainless steel | 467.6 | | | |
| | | AL - aluminum | 178.0 | | | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Triple Plane V - Ring Style 10 Female NPT x Female NPT

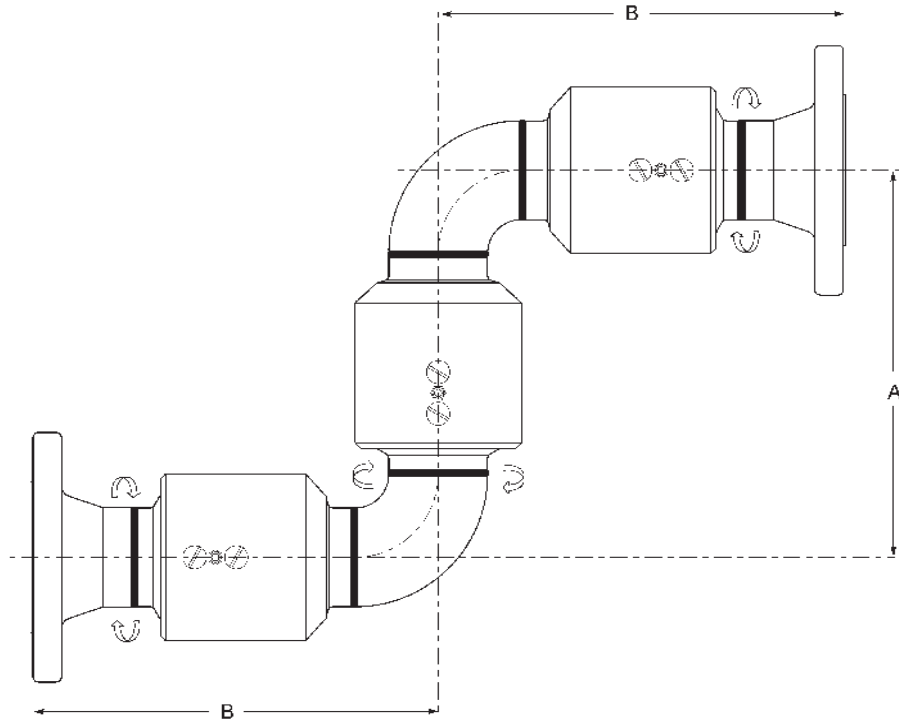


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | |
|------|--------|----------------------|--------------|---------------------|---------|
| | | | | A | B |
| 2" | 210FXF | CS - carbon steel | 32.0 | 9-5/16" | 9" |
| | | SS - stainless steel | 32.5 | | |
| 3" | 310FXF | CS - carbon steel | 49.8 | 11-3/4" | 10-7/8" |
| | | SS - stainless steel | 50.4 | | |
| 4" | 410FXF | CS - carbon steel | 97.4 | 15" | 13-3/8" |
| | | SS - stainless steel | 101.3 | | |
| 6" | 610FXF | CS - carbon steel | 210.2 | 20-3/8" | 16-1/4" |
| | | SS - stainless steel | --- | | |
| | | AL - aluminum | --- | | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

Triple Plane V - Ring Style 10 150# ASA Flange x 150# ASA Flange

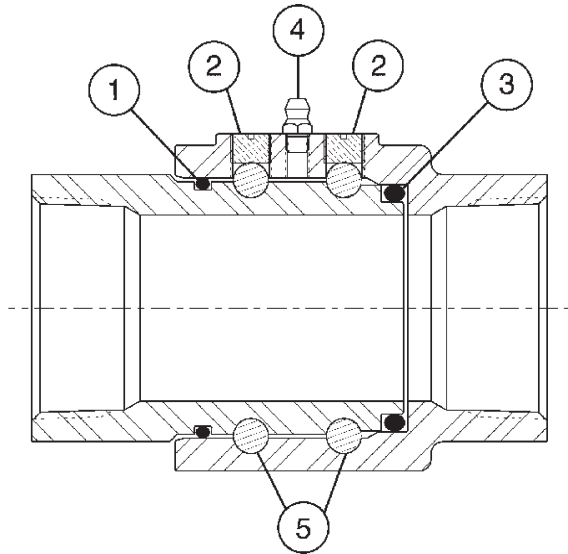


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | |
|------|----------|----------------------|--------------|---------------------|----------|
| | | | | A | B |
| 2" | 210FGXFG | CS - carbon steel | 42.1 | 9-5/16" | 9-13/16" |
| | | SS - stainless steel | 41.4 | | |
| 3" | 310FGXFG | CS - carbon steel | 68.6 | 11-3/4" | 11-1/2" |
| | | SS - stainless steel | 67.4 | | |
| 4" | 410FGXFG | CS - carbon steel | 118.6 | 15" | 14" |
| | | SS - stainless steel | 121.7 | | |
| 6" | 610FGXFG | CS - carbon steel | 222.1 | 20-3/8" | 17-7/8" |
| | | SS - stainless steel | 233.9 | | |
| | | AL - aluminum | 97.2 | | |
| 8" | 810FGXFG | CS - carbon steel | 386.9 | 24-5/8" | 20-5/8" |
| | | SS - stainless steel | 430.1 | | |
| | | AL - aluminum | 162.8 | | |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings
- *Aluminum* for retainers in carbon steel swivels
- *PTFE* for retainers in stainless steel swivels

O-ring Parts Identification List



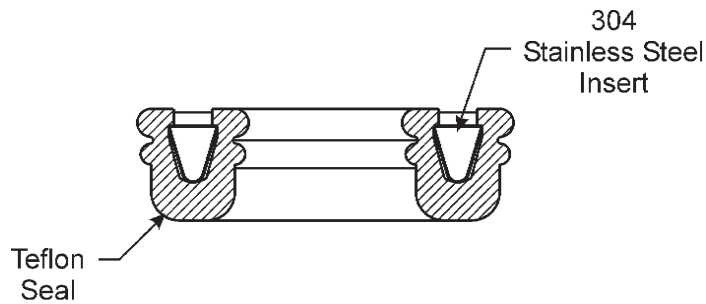
- 1) O-ring (dust) seal
- 2) ball retainer screw
- 3) O-ring (pressure) seal
- 4) grease fitting
- 5) ball bearings

female NPT shown

Other available end configurations:

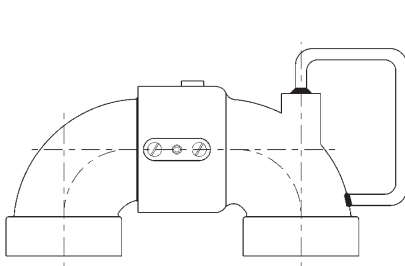
- Tank car thread with gasket
- TTMA tank truck flange

Spring-Loaded PTFE Pressure Seal for O-ring Swivels

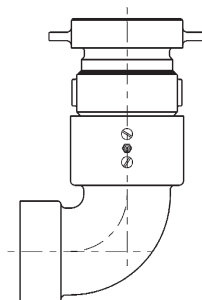


Cross Sectional View of Seal
(for use in sizes 1" - 3")

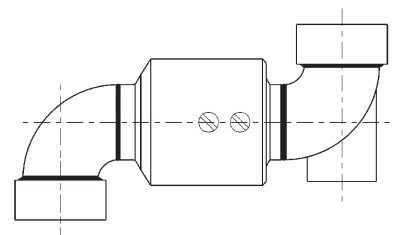
Special Options for O-ring Swivels



Swivel with Handle
(style 40 shown)



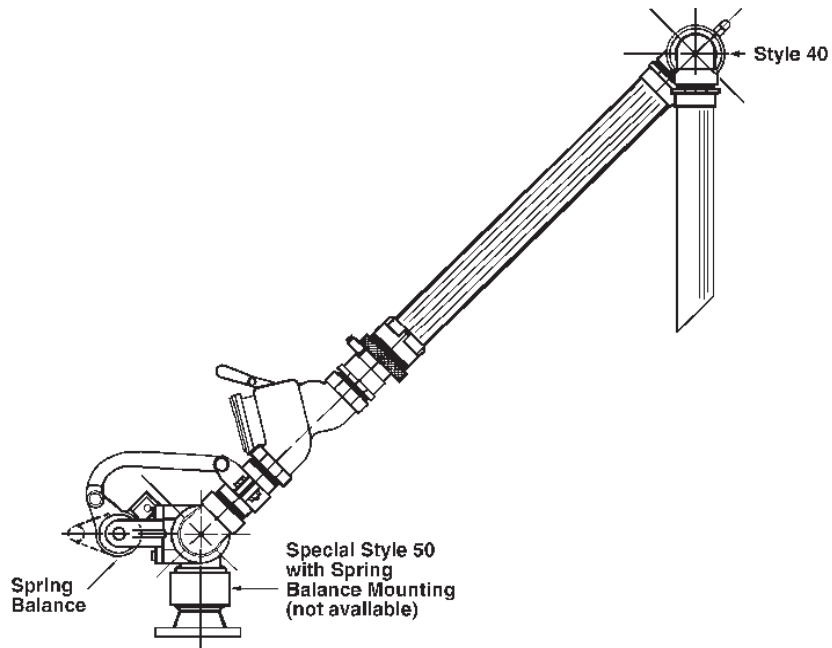
Tank Car Swivel
(style 30 shown)



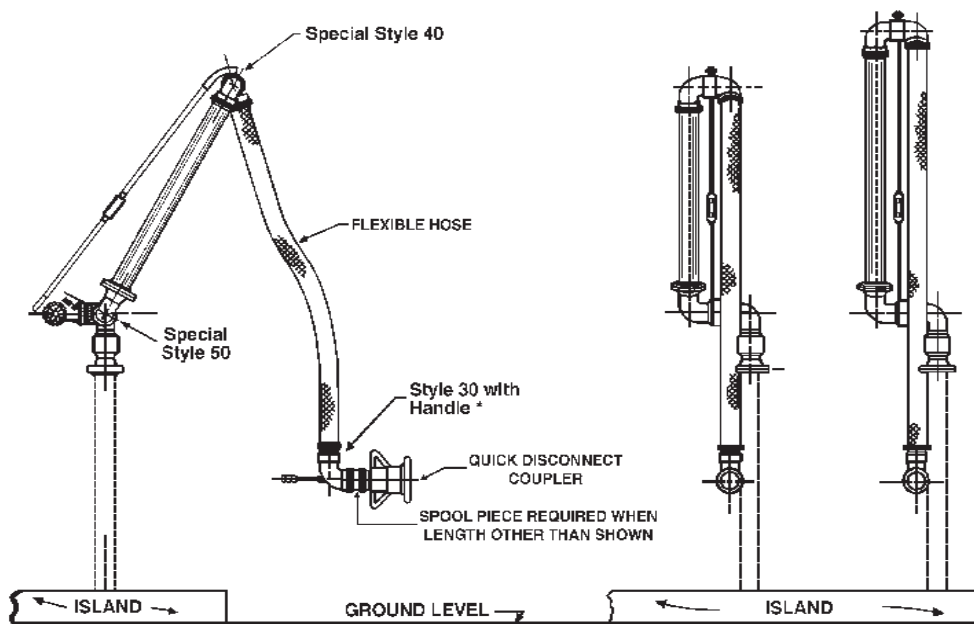
Swivel Assembly with
Counterweight Lug
(style 40 shown)

Typical Applications for O-ring Swivels

Loading Arm



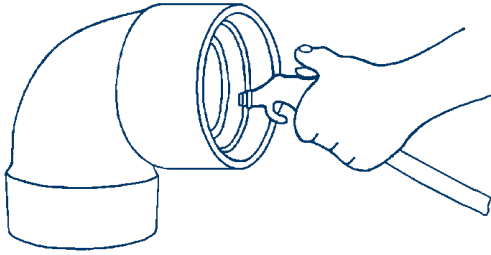
Hose Loaders



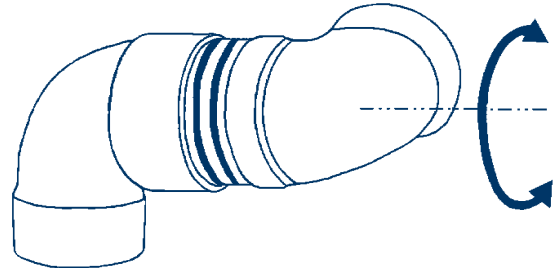
Note: style 60 may also be used in this application

O-ring Swivel Seal Replacement Procedure

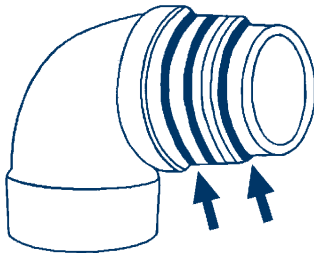
Note: Instructions not for assembly with spring-loaded PTFE pressure seal. Consult the factory.



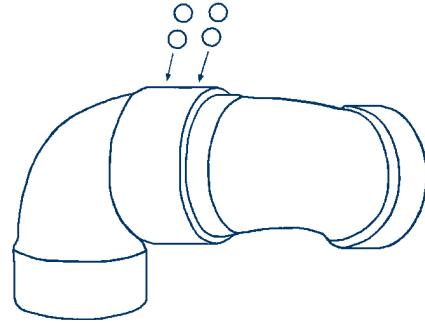
1 Remove the ball retainer screws. Add a sufficient amount of solvent into each raceway to flush out the lubricant. Rotate the sleeve, catching the balls as they fall out. When all the balls have been removed, the body and sleeve can be separated. Discard old seals. Thoroughly clean the body and sleeve.



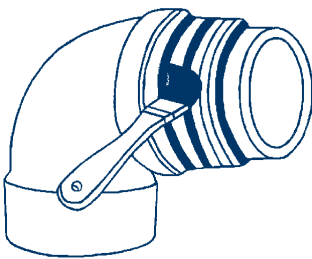
4 Insert the sleeve into the body, slowly rotate the sleeve while inserting into the body.



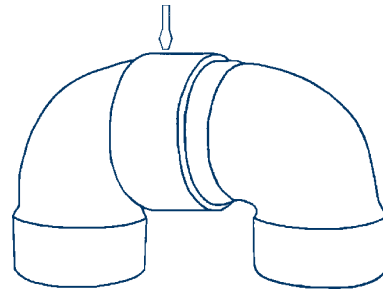
2 Install the new O rings on the sleeve, dust seal to the rear, product (pressure) seal up front.



5 When the sleeve is fully inserted, feed the ball bearings into the raceways while rotating the sleeve. To make space for all the balls, insert a screw driver into the raceway, while continuing to rotate the sleeve in one direction (be careful not to damage the threads). This will cause the balls to jam up, making room for the remaining balls. Now reverse rotation of sleeve and insert the remaining balls.



3 Lubricate the body and the sleeve with grease.



6 Reinstall ball retainer screws until tight. If this interferes with the smooth rotation of the ball bearings, then back off 1/8 - 1/4 turn. A thread locking sealant is recommended to prevent screws from backing off. After pressure testing, the unit is ready for installation.



Caution:

Body and sleeve are matched during manufacturing. Do not mix components with other units.

Optional Seals for O-Ring Swivels

O-Ring - Pressure Seals

- O-Ring Pressure seal material: Viton®, Spring-loaded PTFE, EPR, Food Grade Buna and Buna-N. Buna-N is standard.
- O-Ring pressure seals are available in 1", 1¼" and 1½", 2", 3" and 4"

O-Ring - Dust Seals

- Dust seal material: Viton®, EPR and Buna-N. Buna-N is standard.
- O-Ring dust seals are available in 1", 1¼", 1½", 2", 3" and 4".

Note: When a change of seals is ordered, only the pressure seal is changed unless specifically requested by the customer.

Rebuild Kits for O-Ring Swivels

O-Ring Swivel Rebuild Kit - each kit contains 1 O-Ring (pressure seal) in the material indicated, 1 Buna-N dust seal, 2 ball retainer screws, 1 grease plug and 10 ball bearings.

| Size | Buna | Viton® | PTFE | EPR |
|------------|-----------------|-----------------|-----------------|-----------------|
| 1" | <i>1RKOBU</i> | <i>1RKОВI</i> | <i>1RKOTF</i> | --- |
| 1¼ and 1½" | <i>150RKOBU</i> | <i>150RKОВI</i> | <i>150RKOTF</i> | <i>150RKOEP</i> |
| 2" | <i>2RKOBU</i> | <i>2RKОВI</i> | <i>2RKOTF</i> | <i>2RKOEP</i> |
| 3" | <i>3RKOBU</i> | <i>3RKОВI</i> | <i>3RKOTF</i> | <i>3RKOEP</i> |
| 4" | <i>4RKOBU</i> | <i>4RKОВI</i> | --- | <i>4RKOEP</i> |

Note: All rebuild kits are per plane of rotation

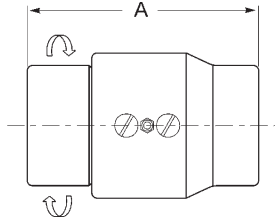
Optional Ball Bearings for O-Ring Swivels

- material: 440 stainless steel or 316 stainless steel
- ball bearings are offered in 1", 1¼", 1½", 2", 3" and 4"

Replacement Ball Bearings for O-Ring Swivels

| Size | Qty Per Plane of Rotation | Carbon Steel (Standard) | 440 Stainless Steel | 316 Stainless Steel |
|------------|------------------------------|----------------------------|---------------------|---------------------|
| | | <i>Part #</i> | <i>Part #</i> | <i>Part #</i> |
| 1" | 40 | <i>14CSBA</i> | <i>14SSBA</i> | <i>14SSBA-316</i> |
| 1¼ and 1½" | 56 | <i>14CSBA</i> | <i>14SSBA</i> | <i>14SSBA-316</i> |
| 2" | 46 | <i>38CSBA</i> | <i>38SSBA</i> | <i>38SSBA-316</i> |
| 3" | 60 | <i>38CSBA</i> | <i>38SSBA</i> | <i>38SSBA-316</i> |
| 4" | 80 | <i>38CSBA</i> | <i>38SSBA</i> | <i>38SSBA-316</i> |

Single Plane O - Ring Style 20 Female NPT x Female NPT

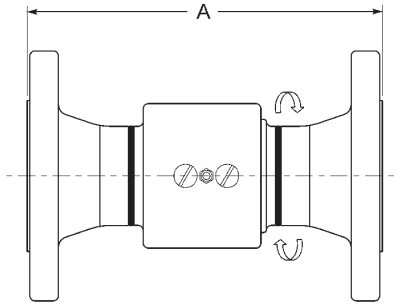


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) A |
|---------------------|----------|---------------------|--------------|--------------------------|
| 1" | 120FXF | OC - carbon steel | 2.80 | 3-15/16" |
| | | OS- stainless steel | 2.50 | |
| 1 1/4" | 12520FXF | AL - aluminum | 1.10 | 3-15/16" |
| | | AL - aluminum | 1.40 | |
| 1 1/2" | 15020FXF | OC - carbon steel | 3.55 | 4" |
| | | OS- stainless steel | 3.55 | |
| | | AL - aluminum | 1.40 | 4" |
| | | BR- brass | 4.30 | |
| MI - malleable iron | 3.80 | | | |
| 2" | 220FXF | OC - carbon steel | 6.30 | 5-9/16" |
| | | OS- stainless steel | 6.80 | |
| | | AL - aluminum | 3.50 | 5-9/16" |
| | | BR- brass | 8.50 | |
| MI - malleable iron | 7.50 | | | |
| 3" | 320FXF | OC - carbon steel | 8.60 | 5-7/8" |
| | | OS- stainless steel | 9.00 | |
| | | AL - aluminum | 4.00 | 5-29/32" |
| | | BR- brass | 11.10 | |
| MI - malleable iron | 9.70 | | | |
| 4" | 420FXF | AL - aluminum | 7.30 | 7-5/8" |

Swivels are shipped standard with the following components:

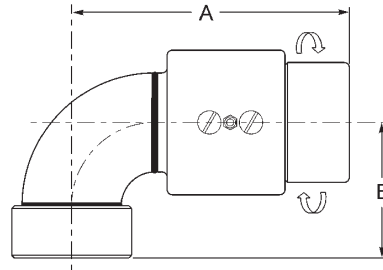
- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings

**Single Plane O - Ring Style 20
150# ASA Flange x 150# ASA Flange**



| Size | Part # | Material | Weight (lbs) | Dimensions (inches) A |
|------|-------------------|----------------------------|--------------|--------------------------|
| 1" | <i>120FGXFG</i> | OC -carbon steel | 7.80 | 7-9/32" |
| 1½" | <i>15020FGXFG</i> | OC -carbon steel | 11.60 | 8-1/16" |
| | | OS -stainless steel | 11.60 | 8-11/16" |
| 2" | <i>220FGXFG</i> | AL -aluminum | --- | 8-17/32" |
| | | OC -carbon steel | 16.60 | 10-3/8" |
| | | OS -stainless steel | 16.60 | |
| 3" | <i>320FGXFG</i> | AL -aluminum | 7.50 | |
| | | OC -carbon steel | 30.60 | 9-5/8" |
| | | OS -stainless steel | 30.60 | 11-5/32" |
| 4" | <i>420FGXFG</i> | AL -aluminum | 10.00 | 13-5/16" |
| | | AL -aluminum | 13.00 | |

Single Plane O - Ring Style 30 Female NPT x Female NPT

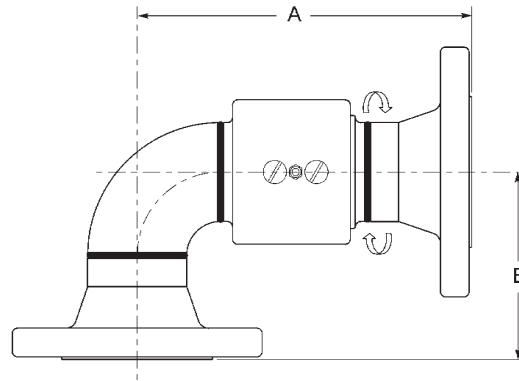


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | |
|---------------------|----------|---------------------|--------------|---------------------|----------|
| | | | | A | B |
| 1" | 130FXF | OC - carbon steel | 3.6 | 4-13/32" | 2-3/16" |
| | | OS- stainless steel | 3.0 | 5-29/32" | 2-11/16" |
| 1½" | 15030FXF | OC - carbon steel | 5.0 | 5-7/16" | 3-15/32" |
| | | OS- stainless steel | 5.6 | | |
| | | AL - aluminum | 1.7 | 4-11/16" | 3" |
| | | BR- brass | 5.2 | | |
| | | MI - malleable iron | 4.6 | | |
| 2" | 230FXF | OC - carbon steel | 7.6 | 6-21/32" | 3-1/4" |
| | | OS- stainless steel | 6.3 | | |
| | | AL - aluminum | 4.1 | 6-3/16" | 2-7/8" |
| | | BR- brass | 9.9 | | |
| MI - malleable iron | 8.8 | | | | |
| 3" | 330FXF | OC - carbon steel | 13.4 | 8-9/64" | 4-13/16" |
| | | OS- stainless steel | 13.2 | | |
| | | AL - aluminum | 5.2 | 7-1/16" | 3-7/8" |
| | | BR- brass | 15.4 | | |
| MI - malleable iron | 13.0 | | | | |
| 4" | 430FXF | AL - aluminum | 9.2 | 9-1/8" | 4-3/4" |

Swivels are shipped standard with the following components:

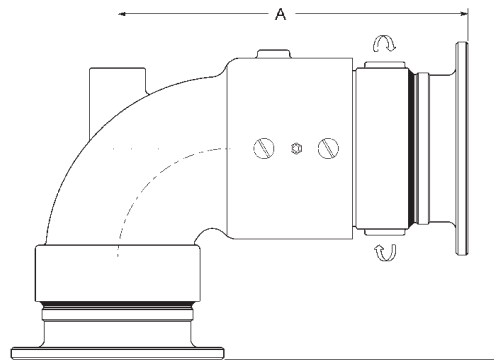
- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings

Single Plane O - Ring Style 30 150# ASA Flange x 150# ASA Flange



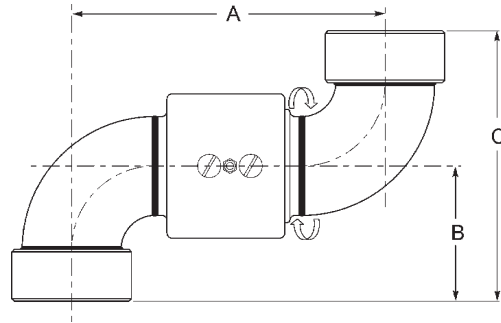
| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | |
|------|------------|----------------------|--------------|---------------------|----------|
| | | | | A | B |
| 1" | 130FGXFG | OC - carbon steel | --- | 6-3/32" | 3-3/16" |
| | | OS - stainless steel | --- | 6-19/32" | 3-11/16" |
| 1½" | 15030FGXFG | OC - carbon steel | --- | 7-7/8" | 4-11/16" |
| | | OS - stainless steel | --- | 7-1/32" | 5-11/32" |
| | | AL - aluminum | --- | 8-1/32" | 4-1/2" |
| 2" | 230FGXFG | OC - carbon steel | 20.20 | 8-1/32" | 5-9/32" |
| | | OS - stainless steel | 20.20 | 8-5/8" | 5-9/32" |
| | | AL - aluminum | --- | 9-7/8" | 5-3/4" |
| 3" | 330FGXFG | OC - carbon steel | 32.90 | 9-11/16" | 6-15/32" |
| | | OS - stainless steel | 32.90 | 11-31/32" | 7-19/32" |
| | | AL - aluminum | 12.80 | | |
| 4" | 430FGXFG | AL - aluminum | 14.00 | | |

Tank Truck Flange x Tank Truck Flange



| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | |
|------|----------|----------------------|--------------|---------------------|---------|
| | | | | A | B |
| 2" | 230TFXTF | OC - carbon steel | --- | --- | --- |
| | | OS - stainless steel | --- | --- | --- |
| | | AL - aluminum | --- | 8-3/4" | 5-9/16" |
| 3" | 330TFXTF | OC - carbon steel | --- | 10-15/16" | 6-9/16" |
| | | OS - stainless steel | --- | | |
| | | AL - aluminum | --- | | |
| 4" | 430TFXTF | AL - aluminum | 12.00 | | |

Single Plane O - Ring Style 40 Female NPT x Female NPT

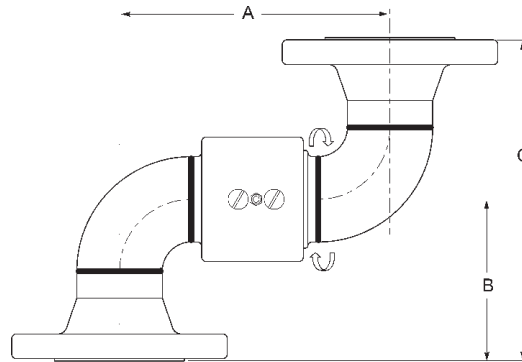


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | | |
|---------------------|----------|----------------------|--------------|---------------------|----------|----------|
| | | | | A | B | C |
| 1" | 140FXF | OC - carbon steel | 4.4 | 4-59/64" | 2-3/16" | 4-3/8" |
| | | OS - stainless steel | | 5-59/64" | 2-11/16" | 5-3/8" |
| 1½" | 15040FXF | OC - carbon steel | --- | 7-11/16" | 3-15/32" | 6-15/16" |
| | | OS - stainless steel | 7.0 | | | |
| | | AL - aluminum | 2.3 | 6-1/8" | 3" | 6" |
| | | BR - brass | 6.8 | | | |
| | | MI - malleable iron | 6.2 | | | |
| 2" | 240FXF | OC - carbon steel | 8.5 | 7-17/32" | 3-1/4" | 6-1/2" |
| | | OS - stainless steel | --- | | | |
| | | AL - aluminum | 4.5 | 6-11/16" | 2-7/8" | 5-3/4" |
| | | BR - brass | 11.2 | | | |
| MI - malleable iron | 9.1 | | | | | |
| 3" | 340FXF | OC - carbon steel | 17.7 | 10-1/8" | 4-13/16" | 9-5/8" |
| | | OS - stainless steel | --- | | | |
| | | AL - aluminum | 5.9 | 8-1/4" | 3-7/8" | 7-3/4" |
| | | BR - brass | 18.0 | | | |
| MI - malleable iron | 15.0 | | | | | |
| 4" | 440FXF | AL - aluminum | 10.2 | 10-5/8" | 4-3/4" | 9-1/2" |

Swivels are shipped standard with the following components:

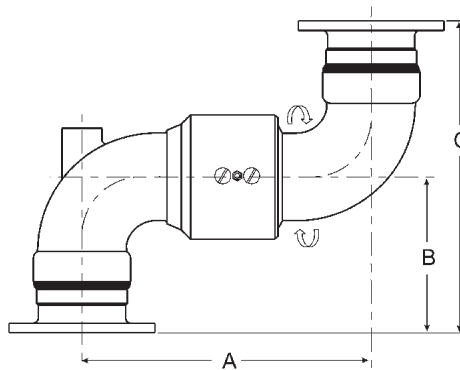
- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings

Single Plane O - Ring Style 40 150# ASA Flange x 150# ASA Flange



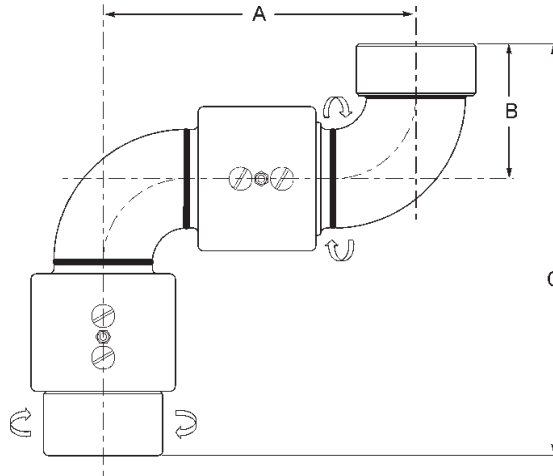
| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | | |
|------|------------|----------------------|--------------|---------------------|----------|----------|
| | | | | A | B | C |
| 1" | 140FGXFG | OC - carbon steel | 8.90 | 4-59/64" | 3-3/16" | 6-3/8" |
| | | OS - stainless steel | 8.90 | 5-59/64" | 3-11/16" | 7-3/8" |
| 1½" | 15040FGXFG | OC - carbon steel | --- | 7-11/16" | 4-11/16" | 9-3/8" |
| | | OS - stainless steel | --- | --- | --- | --- |
| | | AL - aluminum | --- | 6-1/8" | 5-11/32" | 5-11/16" |
| 2" | 240FGXFG | OC - carbon steel | 21.10 | 7-17/32" | 4-1/2" | 9" |
| | | OS - stainless steel | 21.10 | --- | --- | --- |
| | | AL - aluminum | --- | 6-11/16" | 5-9/32" | 10-9/16" |
| 3" | 340FGXFG | OC - carbon steel | 39.70 | 10-1/8" | 5-3/4" | 11-1/2" |
| | | OS - stainless steel | 39.70 | --- | --- | --- |
| | | AL - aluminum | 11.00 | 8-1/4" | 6-5/8" | 13-1/4" |
| 4" | 440FGXFG | AL - aluminum | --- | 10-5/8" | 7-9/16" | 15-1/8" |

Tank Truck Flange x Tank Truck Flange



| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | | |
|------|----------|----------------------|--------------|---------------------|---------|---------|
| | | | | A | B | C |
| 2" | 240TFXTF | OC - carbon steel | --- | --- | --- | --- |
| | | OS - stainless steel | --- | --- | --- | |
| | | AL - aluminum | --- | --- | --- | |
| 3" | 340TFXTF | OC - carbon steel | --- | --- | --- | --- |
| | | OS - stainless steel | --- | --- | --- | |
| | | AL - aluminum | 7.3 | 8-1/4" | 5-9/16" | 11-1/8" |
| 4" | 440TFXTF | AL - aluminum | 17.0 | 10-5/8" | 6-9/16" | 13-1/8" |

Double Plane O - Ring Style 50 Female NPT x Female NPT

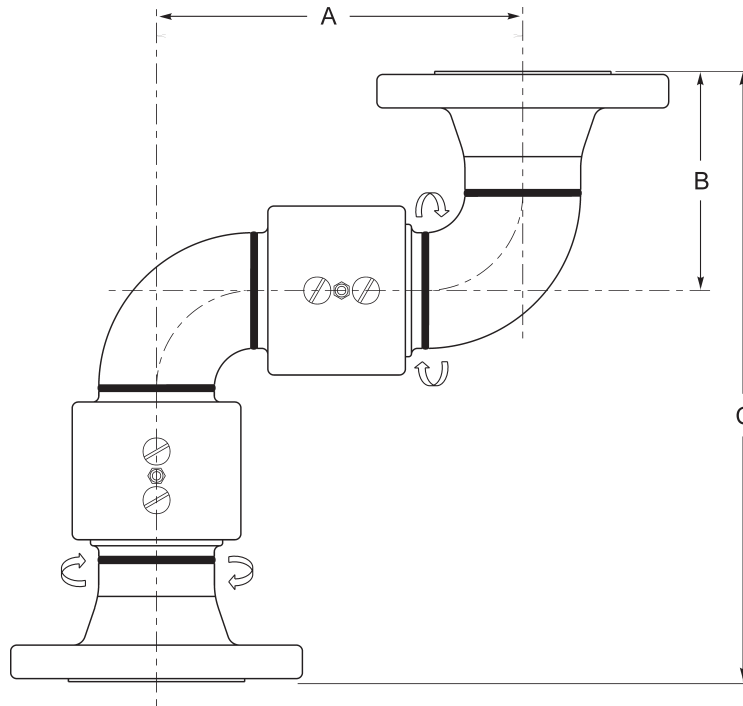


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | | |
|------|----------|----------------------|--------------|---------------------|----------|-----------|
| | | | | A | B | C |
| 1" | 150FXF | OC - carbon steel | 7.30 | 4-59/64" | 2-3/16" | 6-3/32" |
| | | OS - stainless steel | 7.30 | 5-59/64" | 2-11/16" | 7-19/32" |
| 1½" | 15050FXF | OC - carbon steel | 9.00 | 7-11/16" | 3-15/32" | 8-29/32" |
| | | OS - stainless steel | 9.00 | | | |
| | | AL - aluminum | --- | 6-1/8" | 3" | 7-11/16" |
| 2" | 250FXF | OC - carbon steel | --- | 7-17/32" | 3-1/4" | 9-29/32" |
| | | OS - stainless steel | --- | | | |
| | | AL - aluminum | 7.80 | | | |
| | | BR - brass | 14.90 | 6-11/16" | 2-7/8" | 9-1/16" |
| 3" | 350FXF | MI - malleable iron | 13.20 | | | |
| | | OC - carbon steel | 21.80 | 10-1/8" | 4-13/16" | 12-61/64" |
| | | OS - stainless steel | 21.80 | | | |
| | | AL - aluminum | 9.40 | 8-1/4" | 3-7/8" | 10-29/32" |
| | | MI - malleable iron | 21.50 | | | |
| 4" | 450FXF | AL - aluminum | 15.00 | 10-5/8" | 4-3/4" | 13-7/8" |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings

Double Plane O - Ring Style 50 150# ASA Flange x 150# ASA Flange

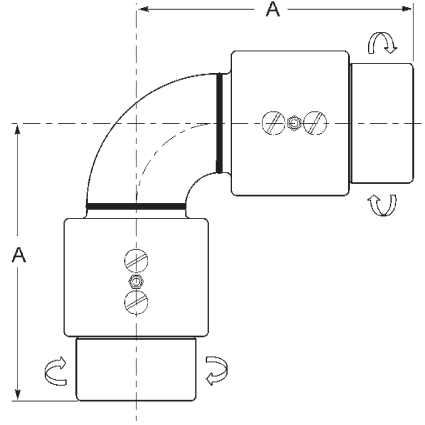


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | | |
|------|------------|----------------------|--------------|---------------------|----------|-----------|
| | | | | A | B | C |
| 1" | 150FGXFG | OC - carbon steel | --- | 4-59/64" | 3-3/16" | 9-19/64" |
| | | OS - stainless steel | --- | 5-59/64" | 3-11/16" | 10-19/64" |
| 1½" | 15050FGXFG | OC - carbon steel | --- | 7-11/16" | 4-11/16" | 12-9/16" |
| | | OS - stainless steel | --- | 7-11/16" | 4-11/16" | 12-9/16" |
| 2" | 250FGXFG | AL - aluminum | --- | 6-1/8" | 5-11/32" | 12-3/8" |
| | | OC - carbon steel | --- | 7-17/32" | 4-1/2" | 12-17/32" |
| 3" | 350FGXFG | OS - stainless steel | --- | 6-11/16" | 5-9/32" | 13-29/32" |
| | | OC - carbon steel | --- | 10-1/8" | 5-3/4" | 15-5/8" |
| 4" | 450FGXFG | OS - stainless steel | --- | 8-1/4" | 6-15/32" | 16-3/32" |
| | | AL - aluminum | --- | 10-5/8" | 7-19/32" | 19-9/16" |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings

Double Plane O - Ring Style 60 Female NPT x Female NPT

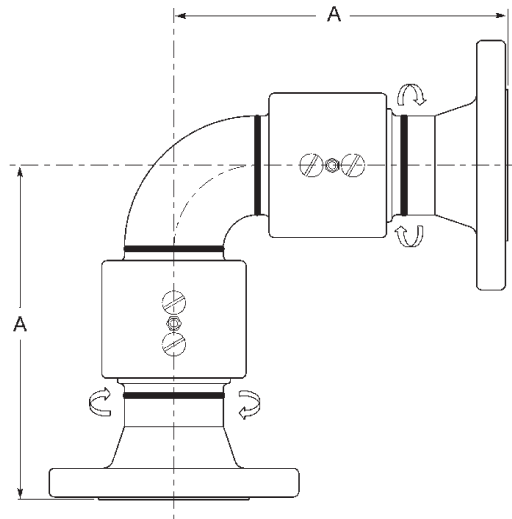


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) A |
|------|----------|----------------------|--------------|--------------------------|
| 1" | 160FXF | OC - carbon steel | 7.00 | 4-13/32" |
| | | OS - stainless steel | --- | 4-29/32" |
| 1½" | 15060FXF | OC - carbon steel | --- | 5-7/16" |
| | | OS - stainless steel | 7.70 | --- |
| | | AL - aluminum | --- | 4-11/16" |
| 2" | 260FXF | OC - carbon steel | 12.30 | 6-21/32" |
| | | OS - stainless steel | 12.30 | --- |
| | | AL - aluminum | 6.90 | --- |
| | | BR - brass | 14.30 | 6-7/32" |
| 3" | 360FXF | MI - malleable iron | --- | --- |
| | | OC - carbon steel | 19.40 | 8-9/64" |
| | | OS - stainless steel | --- | --- |
| 4" | 460FXF | AL - aluminum | 8.60 | 7-1/32" |
| | | MI - malleable iron | 18.60 | --- |
| | | AL - aluminum | 13.40 | 9-1/8" |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings

Double Plane O - Ring Style 60 150# ASA Flange x 150# ASA Flange

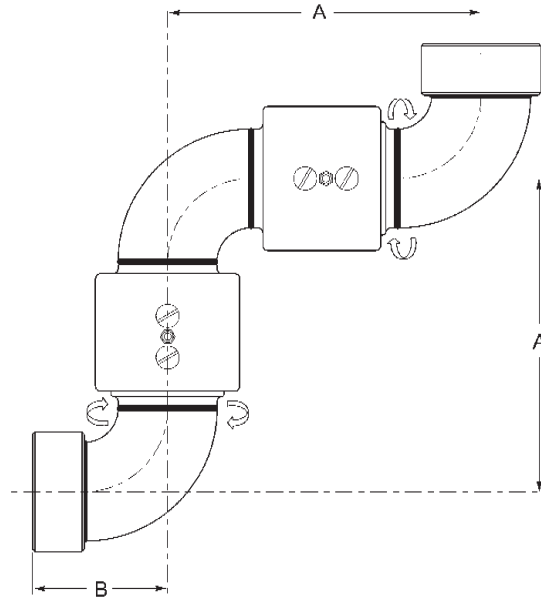


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) A |
|------|----------|----------------------|--------------|--------------------------|
| 1" | 160FGXFG | OC - carbon steel | --- | 6-7/64" |
| | | OS - stainless steel | --- | 6-39/64" |
| 1½" | 1560FGFG | OC - carbon steel | --- | 7-7/8" |
| | | OS - stainless steel | --- | |
| | | AL - aluminum | --- | 7-1/32" |
| 2" | 260FGXFG | OC - carbon steel | 24.90 | 8-1/32" |
| | | OS - stainless steel | 24.90 | |
| | | AL - aluminum | --- | 8-5/8" |
| 3" | 360FGXFG | OC - carbon steel | --- | 9-7/8" |
| | | OS - stainless steel | --- | |
| | | AL - aluminum | --- | 9-5/8" |
| 4" | 460FGXFG | AL - aluminum | --- | 11-31/32" |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings

Triple Plane O - Ring Style 70 Female NPT x Female NPT

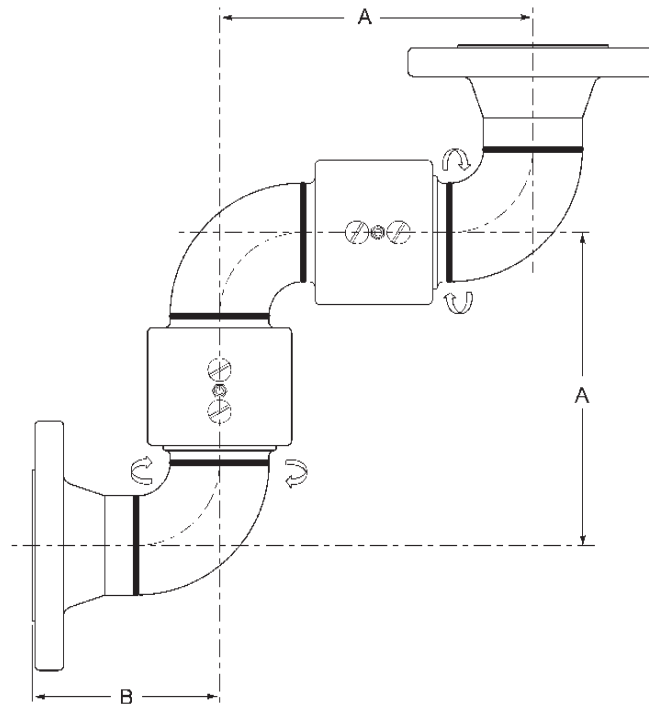


| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | |
|---------------------|----------|----------------------|--------------|---------------------|----------|
| | | | | A | B |
| 1" | 170FXF | OC - carbon steel | 7.60 | 4-59/64" | 2-3/16" |
| | | OS - stainless steel | --- | 5-59/64" | 2-11/16" |
| 1½" | 15070FXF | OC - carbon steel | --- | 7-11/16" | 3-15/32" |
| | | OS - stainless steel | --- | | |
| | | AL - aluminum | 3.80 | 6-1/8" | 3" |
| 2" | 270FXF | OC - carbon steel | 16.40 | 7-17/32" | 3-1/4" |
| | | OS - stainless steel | --- | | |
| | | AL - aluminum | 7.80 | 6-11/16" | 2-7/8" |
| | | BR - brass | --- | | |
| MI - malleable iron | --- | | | | |
| 3" | 370FXF | OC - carbon steel | --- | 10-1/8" | 4-13/16" |
| | | OS - stainless steel | --- | | |
| | | AL - aluminum | 10.10 | 8-1/4" | 3-7/8" |
| 4" | 470FXF | AL - aluminum | 16.70 | 10-5/8" | 4-3/4" |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings

Triple Plane O - Ring Style 70 150# ASA Flange x 150# ASA Flange



| Size | Part # | Material | Weight (lbs) | Dimensions (inches) | |
|------|----------|----------------------|--------------|---------------------|----------|
| | | | | A | B |
| 1" | 170FGXFG | OC - carbon steel | --- | 4-59/64" | 3-3/16" |
| | | OS - stainless steel | --- | 5-59/64" | |
| 1½" | 1570FGFG | OC - carbon steel | --- | 7-11/16" | 4-11/16" |
| | | OS - stainless steel | --- | 6-1/8" | |
| | | AL - aluminum | --- | 5-11/32" | |
| 2" | 270FGXFG | OC - carbon steel | --- | 7-17/32" | 4-1/2" |
| | | OS - stainless steel | --- | 6-11/16" | |
| | | AL - aluminum | --- | 5-9/32" | |
| 3" | 370FGXFG | OC - carbon steel | --- | 10-1/8" | 5-3/4" |
| | | OS - stainless steel | --- | 8-1/4" | |
| | | AL - aluminum | --- | 6-15/32" | |
| 4" | 470FGXFG | AL - aluminum | --- | 10-5/8" | 7-19/32" |

Swivels are shipped standard with the following components:

- *Buna-N* for pressure seals and dust seals
- *Carbon steel* for ball bearings

Trademarks

PTFE is a registered trademark of E.I. duPont Nemours and Company.

Viton® is a registered trademark of DuPont Dow Elastomers.

Corrosion Resistance of Coupling Material

Caution

The following data has been compiled from generally available sources and should not be relied upon without consulting and following the specific recommendations of the manufacturer regarding particular coupling materials.

Ratings

| Metal | Non-Metal | Gasket/Seal Material |
|---|---|---|
| 1 - excellent 2 - good 3 - fair X- not recommended -- contact factory | A- acceptable X- not recommended -- contact factory | T - PTFE V - Viton® E - EPDM, EPR N - Neoprene B - Buna N |

Note: 1. Ratings given are based at 70°F. Chemical compatibility varies greatly with temperature. For applications at temperatures other than 70°F, contact the factory for recommendations.

2. Gasket / seal materials are not necessarily listed in order of preference.

3. Chemical resistance of a material does not necessarily indicate the suitability of a fitting in a given application due to variables such as improper clamp and coupling application, special hose construction, gasket material, etc.

Special caution should be taken when handling hazardous materials.

| AGENT | Aluminum | Brass | Malleable Iron Carbon Steel | Stainless Steel, 316 | Seal Material |
|-----------------------------------|-----------------|--------------|--|-----------------------------|----------------------|
| Acetate Solvents (Crude) | 1 | X | 2 | 1 | T |
| Acetate Solvents (Pure) | 1 | 1 | X | 1 | T |
| Acetic Acid (80%) | 3 | X | X | 1 | TEVNB |
| Acetic Acid (50%) | 2 | X | X | 1 | TEVNB |
| Acetic Acid (20%) | 2 | X | X | 1 | TEVNB |
| Acetic Acid (10%) | 2 | X | X | 1 | TEVNB |
| Acetic Anhydride | 2 | X | 2 | 2 | TNB |
| Acetone | 1 | 2 | 2 | 1 | TE |
| Acetylene | 1 | X | 2 | 1 | TEVNB |
| Alcohols | | | | | |
| Amyl Alcohol | 2 | 2 | 2 | 2 | TEVNB |
| Benzyl Alcohol | 2 | 2 | 2 | 1 | TVB |
| Butyl Alcohol | 1 | 2 | 2 | 1 | TEVN |
| Diacetone Alcohol | 1 | 1 | 2 | 2 | TE |
| Ethyl Alcohol | 1 | 2 | 2 | 2 | TEVNB |
| Hexyl Alcohol | - | - | - | - | - |
| Isobutyl Alcohol | - | - | - | - | - |
| Isopropyl Alcohol | 2 | 2 | 2 | 2 | TEVNB |
| Methyl Alcohol (Methanol) | 2 | 2 | 2 | 2 | TENB |
| Octyl Alcohol | - | - | - | - | - |
| Propyl Alcohol | 2 | 2 | 2 | 1 | TEVNB |
| Aluminum | | | | | |
| Aluminum Chloride (Aqu.) | X | X | X | X | TEVNB |
| Aluminum Fluoride (Sat.) | 2 | - | X | 2 | TEVNB |
| Aluminum Nitrate (Sat.) | 3 | X | X | 2 | TEVNB |
| Aluminum Potassium Sulfate (Alum) | 2 | 2 | X | 2 | TEVNB |
| Aluminum Sulfate (Sat.) | X | X | X | 2 | TEVNB |
| Ammonia | | | | | |
| Ammonia Anhydrous | 1 | X | 1 | 1 | TENB |
| Ammonia Gas | X | X | 1 | 1 | TENB |
| Ammonia Nitrate | - | - | - | - | - |
| Ammonium | | | | | |
| Ammonium Bifluoride | - | X | X | - | TEVB |
| Ammonium Carbonate (Sat.) | 2 | X | 2 | 2 | TEVNB |
| Ammonium Casenate | - | - | - | - | - |
| Ammonium Chloride (Sat.) | X | X | X | X | TEVNB |
| Ammonium Hydroxide (Sat.) | 2 | X | 1 | 2 | TEVNB |
| Ammonium Nitrate | 2 | X | X | - | TENB |
| Ammonium Phosphate (10-40%) | X | X | X | 2 | TEVNB |
| Ammonium Sulfate (10-40%) | X | X | X | 2 | TEVNB |
| Aniline | - | X | X | 1 | TV |
| Arsenic Acid | X | X | X | 2 | TEVNB |
| Asphalt | - | - | 2 | 2 | TV |
| Barium | | | | | |
| Barium Carbonate (Sat.) | X | 2 | 2 | 2 | TEVNB |
| Barium Chloride (Sat.) | - | 2 | - | - | TEVNB |
| Barium Hydroxide (Sat.) | X | 2 | 2 | 2 | TEVNB |
| Barium Sulfate | 2 | 2 | X | 2 | TEVNB |
| Barium Sulfide | X | X | 2 | 2 | TEVNB |
| Beer | 1 | 2 | 2 | 1 | TEVNB |
| Benzaldehyde | 2 | 2 | X | 2 | TE |
| Benzene, Benzol | 1 | 2 | 2 | 2 | TV |
| Benzine | - | - | - | - | - |
| Benzoic Acid | 2 | 2 | X | 2 | TVN |
| Black Liquor | X | X | - | 2 | TEVNB |
| Bleach (12.5% Active Chlorine) | X | - | X | X | TEVN |
| Borax | X | 2 | 2 | 1 | TEVNB |
| Boric Acid | 1 | X | X | - | TEVNB |
| Brine Acid | - | 2 | - | - | TEVNB |
| Bromic acid | X | X | - | - | TEVN |
| Bromine Liquid | 2 | - | - | X | TV |
| Butadiene, Butylene | 2 | 2 | 2 | 2 | TVNB |
| Butane | 2 | 2 | 1 | 2 | TV |
| Butyl Acetate | 1 | 2 | 2 | 2 | T |
| Butyric Acid | 2 | 2 | X | 2 | TV |

Ratings given are based at 70°F

Swivel Joints

| AGENT | Aluminum | Brass | Malleable Iron Carbon Steel | Stainless Steel, 316 | Seal Material |
|-----------------------------|----------|-------|--------------------------------|----------------------|---------------|
| Calcium | | | | | |
| Calcium Bisulfate | X | - | X | 2 | T |
| Calcium Bisulfide | - | - | - | 2 | TVB |
| Calcium Bisulfite | X | X | X | 2 | TVNB |
| Calcium Bromide | X | G | X | X | T |
| Calcium Carbonate | X | 2 | 2 | 2 | TEVB |
| Calcium Chloride (Sat.) | - | 2 | 2 | - | TEVNB |
| Calcium Hydroxide (Sat.) | X | 2 | 2 | 2 | TEVNB |
| Calcium Hypochlorite (Sat.) | X | X | X | 2 | TEV |
| Carbon | | | | | |
| Carbon Bisulfide | 1 | X | 2 | 2 | TV |
| Carbon Dioxide (Dry) | 1 | 1 | 2 | 2 | TENB |
| Carbon Dioxide (Wet) | 1 | X | 3 | 2 | TENB |
| Carbon Disulfide | 1 | X | 2 | 2 | TV |
| Carbon Monoxide | 1 | 1 | 2 | 1 | TEVNB |
| Carbon Tetrachloride | X | - | 2 | - | TV |
| Carbonic Acid | 1 | 2 | 2 | 2 | TEVNB |
| Castor Oil | 2 | 2 | 2 | 2 | TEVNB |
| Caustic Potash | X | - | X | 2 | TEVNB |
| Cellosolves | 2 | 2 | 2 | 2 | TE |
| Chlorine (Liquid) | - | - | 2 | 3 | TV |
| Chloroform | - | - | X | - | TV |
| Chlorosulfonic Acid | - | X | 2 | X | T |
| Clorox (Bleach, 5.5% CL) | X | - | X | 2 | TEVB |
| Chromic Acid (50%) | 2 | X | X | - | TVNB |
| Citric Acid | 3 | X | X | - | TEVNB |
| Coke Oven Gas | 2 | 3 | 2 | 2 | TEVN |
| Copper | | | | | |
| Copper Chloride | X | X | X | X | TEVNB |
| Copper Cyanide | X | X | - | 2 | TEVNB |
| Copper Sulfate | X | X | X | 2 | TEVNB |
| Crylic Acid (Conc.) | 2 | 2 | 2 | 2 | TEV |
| Cyclohexane | 2 | 2 | 2 | 2 | TVB |
| Detergents | 2 | 2 | 2 | 2 | TEVNB |
| Dextrose | 2 | - | - | - | TEVNB |
| Diesel Fuels | 1 | 1 | 2 | 1 | TVB |
| Diethylamine | 2 | - | X | 2 | TN |
| Disodium Phosphate | - | - | 1 | 1 | TEV |
| Ethers | 2 | 2 | 2 | 1 | TB |
| Ethyl | | | | | |
| Ethyl Acetate | - | - | 2 | 2 | T |
| Ethyl Chloride | - | - | 2 | 1 | TEVB |
| Ethylene | | | | | |
| Ethylene Chloride | - | - | 2 | - | TV |
| Ethylene Dichloride | - | 2 | 2 | 2 | TV |
| Ethylene Glycol | 1 | 2 | 2 | 2 | TEVNB |
| Ethylene Oxide | 1 | X | 2 | 2 | T |
| Fatty Acids | 1 | 3 | X | 1 | TVNB |
| Ferric | | | | | |
| Ferric Chloride | X | X | X | X | TEVNB |
| Ferric Hydroxide | - | - | - | 1 | TEVNB |
| Ferric Nitrate (10-50%) | X | X | X | 2 | TEVNB |
| Ferric Sulfate | X | X | X | - | TEVNB |
| Ferrous | | | | | |
| Ferrous Chloride (Sat.) | X | X | - | X | TEVNB |
| Ferrous Sulfate | 2 | 2 | X | - | TEVNB |
| Fluboric Acid | X | - | 1 | - | TEVNB |
| Formaldehyde (50%) | - | 2 | X | 1 | TEN |
| Formic Acid (Anhyd.) | 1 | X | X | - | TEVN |
| Freon | | | | | |
| Freon 11 | 2 | 2 | X | 2 | TVNB |
| Freon 12 | 2 | 2 | X | 2 | TVNB |
| Freon 22 | 2 | 2 | X | 2 | TN |
| Fruit Juices | 2 | 2 | X | 2 | TVNB |
| Fuel Oil | 2 | 2 | 2 | 2 | TVNB |

Ratings given are based at 70°F

| AGENT | Aluminum | Brass | Malleable Iron Carbon Steel | Stainless Steel, 316 | Seal Material |
|--------------------------------|----------|-------|--------------------------------|----------------------|---------------|
| Furfural | 2 | 2 | 2 | 2 | TEN |
| Gasoline | | | | | |
| Refined Gasoline | 2 | 2 | 2 | 2 | TVNB |
| Sour Gasoline | X | 2 | 2 | 2 | TVNB |
| Gelatin | 2 | 2 | X | 2 | TEVNB |
| Glucose | 2 | 2 | 2 | 2 | TEVNB |
| Glue | 2 | 2 | 2 | 2 | TEVNB |
| Glycerine | 1 | 1 | 2 | 1 | TEVNB |
| Glycols | 2 | 2 | 2 | 2 | TEVNB |
| Green Liquor | - | - | 2 | - | TEVNB |
| Heptane | 2 | 2 | 2 | 2 | TVNB |
| Hexane | 2 | 2 | 2 | 1 | TVNB |
| Hydrobromic Acid (50%) | X | X | X | X | TEV |
| Hydrobromic Acid (20%) | X | X | X | X | TEV |
| Hydrochloric Acid (20%) | X | X | X | X | TEVNB |
| Hydrochloric Acid (38%) | X | X | X | X | TEVN |
| Hydrocyanic Acid | 2 | X | 2 | 2 | TEVN |
| Hydrofluosilicic Acid (10-50%) | X | 2 | X | 2 | TEVNB |
| Hydrogen | | | | | |
| Hydrogen Peroxide (50%) | - | X | X | - | TEV |
| Hydrogen Sulfide (Aqu.) | - | - | - | 2 | TE |
| Hydrogen Chloride (Dry Gas) | X | 2 | 2 | - | TEVN |
| Hydrogen Gas | 1 | 1 | - | 1 | TEVNB |
| Hypochlorous Acid | X | X | X | X | TEV |
| Iodine | 1 | X | X | X | TEV |
| Isopropyl Ether | - | 2 | - | 2 | T |
| Jet Fuel (JP4, JP5) | 2 | 1 | 2 | 2 | TV |
| Kerosene | 2 | 2 | 2 | 2 | TVNB |
| Ketones | 2 | 2 | 2 | 2 | T |
| Lactic Acid (25%) | 3 | 2 | X | - | TEVN |
| Lactic Acid (80%) | 2 | 2 | X | - | TEVN |
| Lard Oil | 2 | - | 3 | 2 | TVB |
| Lead | | | | | |
| Lead Acetate | X | X | X | 2 | TENB |
| Lead Chloride | X | - | - | 2 | TVNB |
| Lead Sulfate | X | - | X | 2 | TEVNB |
| Lime Sulphur | X | X | X | 2 | TEVN |
| Linoleic Acid | 2 | X | X | 2 | TVB |
| Linseed Oil | 2 | 2 | 2 | 2 | TVNB |
| Lubricants (Oil) | 2 | 1 | 2 | 2 | TVNB |
| Magnesium | | | | | |
| Magnesium Carbonate | 2 | - | - | 2 | TEVNB |
| Magnesium Chloride | X | X | - | - | TEVNB |
| Magnesium Hydroxide | 2 | 2 | 2 | 1 | TEVNB |
| Magnesium Nitrate | 2 | 2 | 2 | 2 | TEVNB |
| Magnesium Oxide | - | - | - | - | - |
| Magnesium Sulfate | 2 | - | - | 2 | TEVNB |
| Maleic Acid | - | 2 | X | 2 | TEV |
| Mercuric | | | | | |
| Mercuric Chloride | X | X | X | - | TEVB |
| Mercuric Cyanide | X | X | X | 2 | TEVB |
| Mercury | X | X | 2 | 1 | TEVNB |
| Methane | 1 | 1 | 2 | 1 | TEVNB |
| Methanol | 2 | 2 | 2 | 2 | TENB |
| Methyl | | | | | |
| Methyl Bromide | X | - | 2 | 2 | TV |
| Methyl Ethyl Ketone | 2 | 2 | 2 | 2 | TE |
| Methyl Isobutyl Ketone | 2 | 2 | 2 | 2 | T |
| Methyl Methacrylate | 2 | - | X | 2 | T |
| Methylene Chloride | - | 2 | 2 | - | T |
| Milk | 1 | X | 2 | 1 | TEVNB |
| Mineral Oil | 2 | 1 | 2 | 2 | TVNB |
| Muriatic Acid | X | - | - | X | TV |
| Napthalene | 2 | 2 | 2 | 1 | TV |
| Naptha | 2 | 2 | 2 | 2 | TVB |

Ratings given are based at 70°F

Swivel Joints

| AGENT | Aluminum | Brass | Malleable Iron Carbon Steel | Stainless Steel, 316 | Seal Material |
|-----------------------------------|----------|-------|--------------------------------|----------------------|---------------|
| Nickel | | | | | |
| Nickel Chloride | X | X | X | - | TEVNB |
| Nickel Sulfate | X | X | - | 2 | TEVNB |
| Nitric | | | | | |
| Nitric Acid (100%) | 1 | X | X | - | TV |
| Nitric Acid (50%) | X | X | X | - | TV |
| Nitric Acid (30%) | X | X | X | - | TV |
| Nitrobenzene | 1 | 2 | 2 | 2 | T |
| Oils | | | | | |
| Castor Oil | 2 | 2 | 2 | 2 | TEVNB |
| Coconut Oil | 2 | - | 3 | 2 | TVB |
| Corn Oil | 2 | 2 | 2 | 2 | TVNB |
| Cotton Seed Oil | 2 | 2 | 2 | 2 | TVNB |
| Fuel Oil | 2 | 2 | 2 | 2 | TVNB |
| Linseed Oil | 2 | 2 | 2 | 2 | TVNB |
| Mineral Oil | 2 | 1 | 2 | 2 | TVNB |
| Silicon Oil | 2 | 1 | 2 | 2 | TEVB |
| Vegetable Oil | 2 | 2 | 2 | 1 | TVNB |
| Oleic Acid | 2 | 3 | 2 | 1 | TB |
| Oleum | 2 | X | 2 | 2 | TV |
| Oxalic Acid (Sat.) | 2 | - | X | X | TEV |
| Oxygen | 2 | 2 | 2 | 2 | TEVNB |
| Palmitic Acid (Sat.) | 2 | 3 | 3 | 2 | TVB |
| Paraffin | 2 | 2 | 2 | 2 | TVNB |
| Perchloroethylene | 2 | 2 | 2 | - | TV |
| Petrolatum | 2 | - | 3 | 2 | TVNB |
| Phenol (Carbolic Acid) | 1 | 1 | 2 | 1 | TV |
| Phosphoric Acid | | | | | |
| Phosphoric Acid (25-50%) | X | X | X | - | TEVN |
| Phosphoric Acid (50-85%) | X | X | X | - | TEV |
| Photographic Solutions | - | - | X | 1 | TVNB |
| Phthalic Anhydride | - | 2 | 2 | 1 | TEV |
| Picric Acid | 1 | X | X | 2 | TEVNB |
| Plating Solutions | | | | | |
| Brass Plating Solution | - | - | - | 2 | TEVNB |
| Cadmium Plating Solution | - | - | - | 2 | TEVNB |
| Chrome 40% Plating Solution | X | 2 | X | 2 | TEVN |
| Copper (Cyanide) Plating Solution | - | - | - | - | TEVNB |
| Gold Plating Solution | - | - | - | 1 | TEVNB |
| Iron Plating Solution | - | - | - | - | TEVB |
| Lead Plating Solution | - | - | - | 1 | TEVNB |
| Nickel Plating Solution | - | - | - | 1 | TEVNB |
| Silver Plating Solution | - | - | - | 1 | TEVNB |
| Tin Plating Solution | - | - | - | 3 | TEVNB |
| Zinc Plating Solution | - | - | - | - | TEVNB |
| Potassium | | | | | |
| Potassium Acetate | X | X | 2 | - | TEVB |
| Potassium Bicarbonate (30%) | X | 2 | 2 | 1 | TEVNB |
| Potassium Carbonate (50%) | X | 2 | 2 | 1 | TEVNB |
| Potassium Chlorate (30%) | 2 | X | 2 | 1 | TEVNB |
| Potassium Chloride (30%) | X | X | 2 | - | TEVNB |
| Potassium Chromate (30%) | 2 | 2 | - | 2 | TEVB |
| Potassium Cyanide Solution (30%) | X | X | 2 | 2 | TEVNB |
| Potassium Dichromate (30%) | 1 | 2 | 2 | 1 | TEVB |
| Potassium Hydroxide (90%) | X | X | - | - | TENB |
| Potassium Nitrate (80%) | 1 | 2 | 2 | 2 | TEVNB |
| Potassium Permanganate (20%) | 2 | 2 | 2 | 2 | TEVN |
| Potassium Sulfate (10%) | 1 | 2 | 2 | 1 | TEVNB |
| Propane | 1 | 1 | 2 | 2 | TVB |
| Propylene Gylcol | 2 | 2 | 2 | 2 | TVNB |
| Propylene Oxide (90%) | - | - | - | 1 | TE |
| Pyridine | 2 | 2 | 2 | 2 | T |
| Pyrogalllic Acid | 2 | 2 | 2 | 2 | TVNB |
| Silver Nitrate | X | X | X | 1 | TEVNB |
| Soap Solutions | 2 | 2 | 2 | 2 | TEVNB |

Ratings given are based at 70°F

| AGENT | Aluminum | Brass | Malleable Iron Carbon Steel | Stainless Steel, 316 | Seal Material |
|---------------------------|-----------------|--------------|--|-----------------------------|----------------------|
| Sodium | | | | | |
| Sodium Acetate | 1 | 2 | X | 2 | TEN |
| Sodium Bicarbonate (20%) | 2 | 2 | 3 | 1 | TEVNB |
| Sodium Bisulfate | X | - | 2 | - | TEVNB |
| Sodium Bisulfite | X | 2 | X | - | TEVNB |
| Sodium Borate | 2 | 2 | 3 | 2 | TEVNB |
| Sodium Perborate (10%) | 2 | X | 2 | 2 | TEVNB |
| Sodium Carbonate | X | 2 | 2 | 2 | TEVNB |
| Sodium Chlorate (50%) | 2 | 2 | X | 2 | TEVNB |
| Sodium Cyanide | X | X | 2 | - | TEVNB |
| Sodium Dichromate | 2 | X | 2 | 2 | TE |
| Sodium Hydroxide (70%) | X | X | 3 | 2 | TENB |
| Sodium Hydroxide (50%) | X | X | 3 | - | TENB |
| Sodium Hydroxide (30%) | X | 2 | 2 | 1 | TENB |
| Sodium Chloride (30%) | X | 2 | 2 | - | TEVNB |
| Sodium Hypochlorite | X | X | X | - | TEV |
| Sodium Metaphosphate | X | X | X | 2 | TEVNB |
| Sodium Nitrate (40%) | 1 | 2 | 2 | 1 | TENB |
| Sodium Perborate (10%) | 2 | X | 2 | 2 | TEVNB |
| Sodium Peroxide (10%) | 2 | X | 2 | 2 | TEVNB |
| Sodium Silicate | 1 | 2 | 2 | 2 | TEVNB |
| Sodium Sulfate | - | 2 | 2 | 1 | TEVNB |
| Sodium Sulfide (50%) | X | X | 2 | 2 | TEVNB |
| Sodium Thiosulphate | 2 | X | X | 2 | TEVNB |
| Stannic Chloride | X | X | X | X | TEVNB |
| Stannous Chloride | X | X | X | - | TEVNB |
| Steam | - | - | - | - | - |
| Stearic Acid | 2 | 3 | 3 | 1 | TVNB |
| Stoddard's Solvent | 2 | 2 | 2 | 2 | TVB |
| Sugar Liquors (Cane) | 1 | 2 | 2 | 2 | TEVNB |
| Sugar Liquors (Beet) | 1 | 2 | 2 | 1 | TEVNB |
| Sulfate Liquors | 2 | X | 3 | 2 | TVNB |
| Sulfite Liquors | X | X | X | 2 | TVNB |
| Sulfur Chloride | X | - | X | - | TV |
| Sulfur Dioxide (Dry) | 2 | 2 | 1 | 2 | TE |
| Sulfur Trioxide | 2 | 2 | 2 | 2 | TEV |
| Sulfuric Acid (TO 10%) | X | 2 | X | X | TEVNB |
| Sulfuric Acid (100%) | X | X | 2 | - | TV |
| Sulfurous Acid | 2 | 2 | X | - | TV |
| Tannic Acid | X | - | X | 2 | TEVNB |
| Tanning Liquors | 1 | - | - | 1 | TVNB |
| Tartaric Acid | - | - | - | 1 | TVNB |
| Titanium Tetrachloride | X | X | 2 | 2 | TV |
| Toluene | 1 | 1 | 1 | 1 | TVB |
| Tetrahydrofuran | X | - | 1 | 2 | T |
| Tomato Juice | 2 | - | 3 | 2 | TEVNB |
| Trichloroethylene | 1 | - | 2 | - | TV |
| Triethanolamine | 2 | X | 2 | 2 | TEVN |
| Triethylamine | - | - | - | 2 | TVB |
| Trisodium Phosphate (10%) | X | 2 | 2 | 1 | TVNB |
| Turpentine | 2 | X | 2 | 1 | TVB |
| Urea (50%) | 2 | - | 2 | 2 | TEVNB |
| Urine | - | - | 2 | 1 | TEVNB |
| Vinegar | 2 | X | 2 | 2 | TEVN |
| Water Acid (Mine) | X | X | X | - | TEVNB |
| Water (Distilled) | X | 2 | X | 2 | TEVNB |
| Water (Sea) | 2 | 2 | X | 2 | TEVNB |
| Whiskey | X | 2 | 2 | 1 | TEVNB |
| White Liquor (Pulp) | 2 | - | X | 2 | TEVNB |
| Wine | X | 2 | X | 1 | TEVNB |
| Xylene | 2 | 2 | 2 | 2 | TV |
| Zinc | | | | | |
| Zinc Chloride | X | X | X | 2 | TEVNB |
| Zinc Nitrate | - | - | - | 2 | TEVNB |
| Zinc Sulfate (50%) | X | 2 | X | 1 | TEVNB |

Ratings given are based at 70°F

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