



Swivel Joints Catalog



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ENGINEERING | WHAT'S NEXT



OPW Engineered Systems specializes in the engineering, designing and manufacturing of systems for the safe and efficient loading and unloading of critical hazardous materials: loading systems, swivel joints, instrumentation, quick and dry disconnect systems and safety breakaways.

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Overview

OPW Engineered Systems manufactures swivel joints for a broad range of uses in the chemical, petroleum, petrochemical, refining, mining, distilling, brewing, ink and paint industries, as well as farm irrigation and fertilizing. Design, plant and maintenance engineers use OPW swivels in flexible piping systems, loading arms, hose reels, sewer rodding and wastewater treatment equipment, and various types of process machinery. They also use our swivel joints in machine tool coolant transfer, drum filling applications, and in a variety of in-plant fluid and dry bulk transfer applications.

Versatility is the key to OPW Engineered Systems' swivel joints. They make it possible for you to use rigid metal piping for loading and unloading fluids and dry product under pressure or vacuum without the difficulty or danger of handling heavy, cumbersome hoses.

Proven Experience

For more than 60 years, OPW Engineered Systems has provided innovative solutions for some of the most challenging liquid handling applications. We take pride in our ability to custom design and manufacture swivel joints for specialized applications. Our engineers will work with you to determine the right swivel joint for your application.

Innovative Products Designed for Safety

Our design efforts are supported by a state-of-the-art CAD system for faster, more accurate responses to your technical requests. OPW swivel joints are durable, reliable, easy to operate and maintain. Available in stainless steel, cast steel, fabricated steel, ductile iron, aluminum or bronze, we meet your most demanding specifications. Our special capabilities include split flange, jacketed, lined and coated.

Quality Control for Dependable Operation

Our manufacturing and testing procedures meet or exceed industry standards. All swivel joints are rigorously tested to ensure high quality. CNC equipment is used to machine all critical dimensions within precise tolerances to ensure that each product meets our rigid engineering specifications. As with every other part of our product, welding is an important quality factor. Our welders are certified to ASME Boiler and Pressure Vessel Code, Section IX. Particularly important is our 100% weld penetration of fabricated steel and stainless-steel swivels to meet code.

Additional testing, including radiography as well as material certifications, can be provided to meet your specific requirements. Special exterior surface preparation and painting is also available.

Rely on OPW Service and Support

Our sales representatives are knowledgeable about our products and skilled in coordinating the steps involved in solving your problems. This personalized professional service ensures your satisfaction. Support personnel are also available to assist you in evaluating which swivel design is best suited for your application.

OPW continually strives to maintain our leadership position in the industry by responding to your needs and supplying the high-quality, dependable products you require.

Design Features

OPW Engineered Systems' fabricated and cast ball bearing swivel joints allow you to construct a metal piping system that permits easy movement in any direction. Moveable, flexible and reliable, OPW Engineered Systems' swivels are designed and built to the highest quality standards, including precision machining and 100% penetration welding, with special design features that include:

1) Tight Seals

- O-Rings provide a tight seal without hindering swivel action
- Accurately machined and micro-finished grooves provide for minimal seal wear
- Available in Buna-N, Viton®, EPT, Neoprene, Kalrez® and other seal materials
- Teflon® seals are available as spring energized or silicone/Viton® encapsulated

2) True Ball Bearing Race Alignment

- Body and tail sections are locked together by a double row of ball bearings
- Raceways are machined to precise tolerances
- Double raceway design assures proper alignment and prevents binding caused by temperature changes and heavy radial loads
- Carbon steel swivels have hardened races to maximize load-carrying capability

3) Protected Bearing Chamber

- Protective inner O-ring seal prevents product from entering bearing chamber
- Outer seal keeps rain, dirt, and other contaminants out
- Both seals hold in lubrication

4) Long-Life Bearings

- Ball bearings are hardened, precision-ground steel
- Stainless steel swivels have stainless steel bearings
- All OPW swivels are available with stainless steel bearings on special order

5) Easy Lubrication

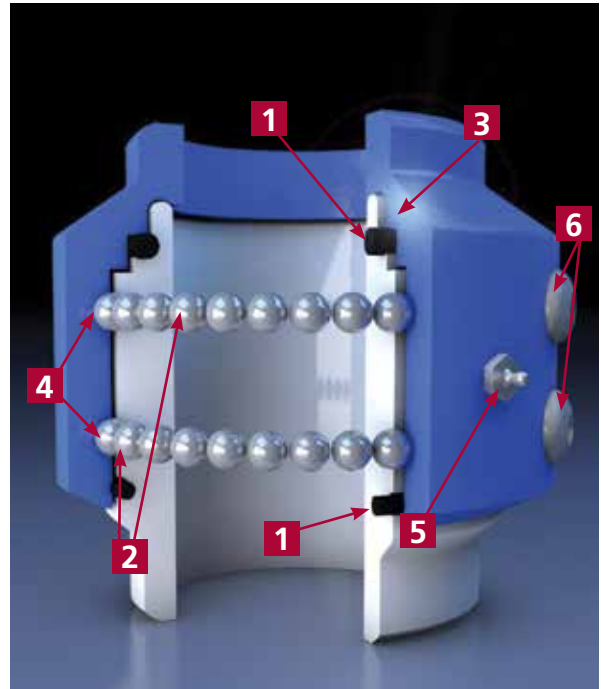
- All OPW swivels are pre-lubricated at the factory
- All 3/4", 1", and submerged swivels are permanently lubricated
- A grease fitting between races that accepts a standard grease gun is available for swivels that require field lubrication
- Non-lubricated swivels are available on special order

6) No Field Adjustment Necessary

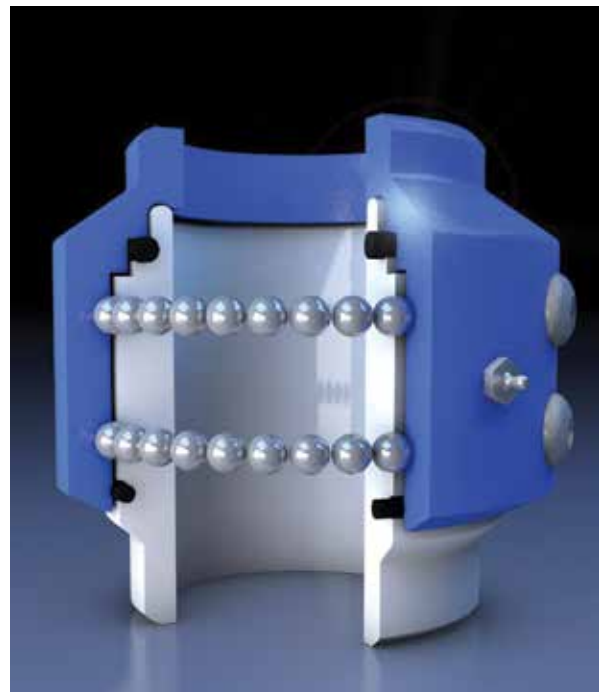
- Balls are held in place by factory-installed plugs that never need to be adjusted to maintain bearing performance

Convenience of Choice

- Available in a variety of sizes beginning at 3/4" and up
- Available in threaded, flanged, and butt welded ends
- Steam jacketed and split flange swivels are also available

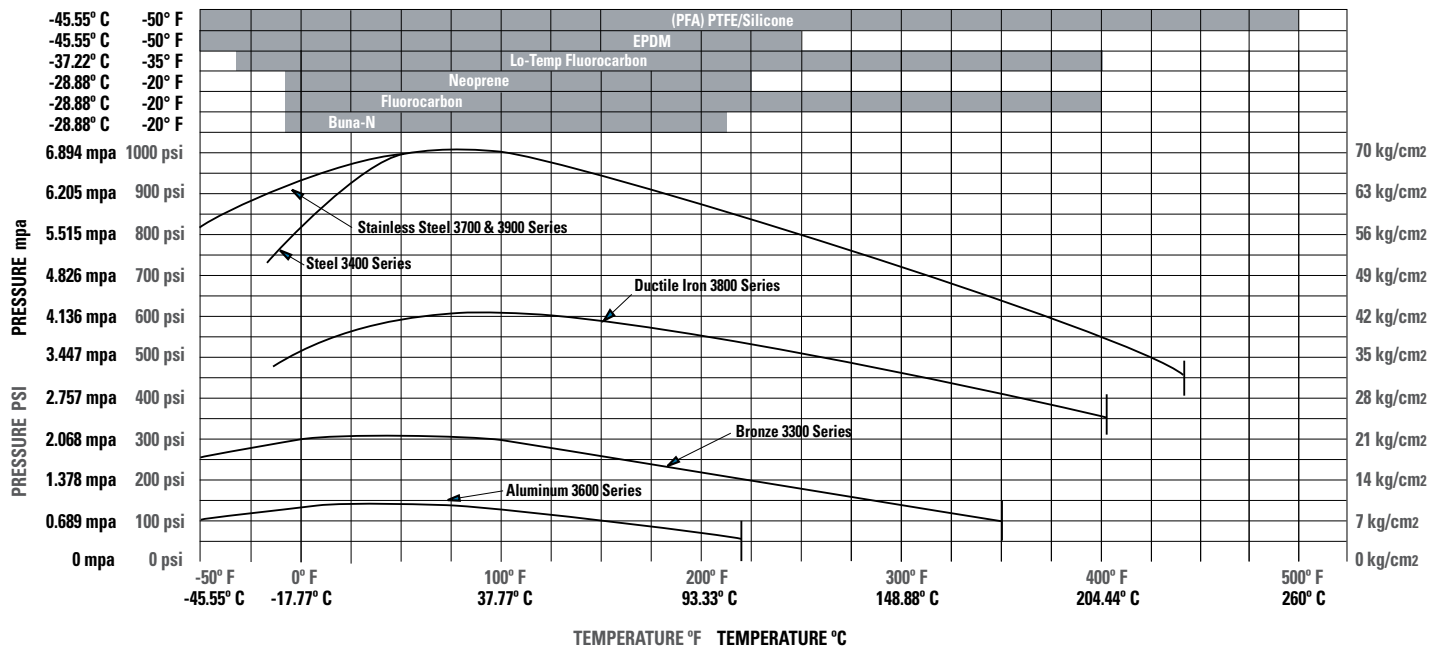


Fabricated Steel and Stainless Steel



Cast High-Pressure Steel
(Main Seal has Teflon® Back-up Ring)

Pressure/Temperature Guide



Availability by Material, Size and Pressure Rating

| Material | 3/4" 20mm | 1" 25mm | 1-1/4" 32mm | 1-1/2" 40mm | 2" 50mm | 3" 80mm | 4" 100mm | 6" 150mm | 8" 200mm | 10" 250mm | 12" 300mm | Pressure Rating* |
|----------------------------------------------|--------------|------------|----------------|----------------|------------|------------|-------------|-------------|-------------|--------------|--------------|----------------------------------------------------------------------|
| Steel, Cast, High-Pressure 3200 Series | | ■ | ■ | ■ | | | | | | | | 3000 psi 210 kg/cm2 20.68 mpa |
| Steel, Fabricated 3400 Series | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1000 psi 70 kg/cm2 6.89 mpa 8", 10" & 12" 500 psi max |
| 316 Stainless Steel 3700 & 3900 Series | ■ | ■ | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | 1000 psi 70 kg/cm2 6.89 mpa 8", 10" & 12" 500 psi max |
| Aluminum 3600 Series | | ■ | | ■ | ■ | ■ | ■ | ■ | | | | 125 psi 9 kg/cm2 0.86 mpa |
| Ductile Iron 3800 Series | | ■ | | ■ | ■ | ■ | ■ | | | | | 600 psi 42 kg/cm2 4.13 mpa |
| Bronze 3300 Series | | ■ | | ■ | ■ | ■ | | | | | | 300 psi 21 kg/cm2 2.06 mpa |

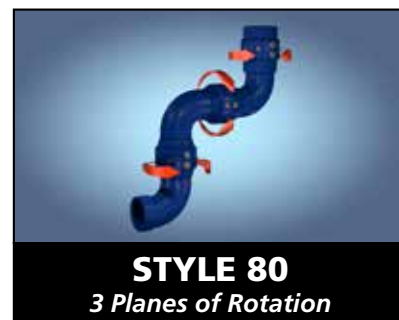
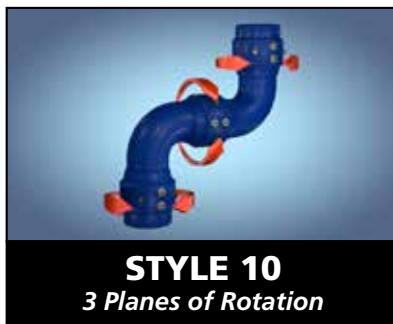
*Maximum pressure rating of OPW swivel joints is as shown, or is determined by the flangelend connection rating, whichever is lower. Buna-N seals are standard in all of the above swivel joints, but each is available with seals made of Viton®, Teflon®, EPT, or Neoprene, depending on the pressures and temperatures of your operation.

Styles Available

OPW Engineered Systems' swivel joints are available in one, two and three planes of rotation for virtually unlimited flexibility. Standard combinations of five different metals and seal materials cover pressures, temperatures, corrosion resistance and load bearing capacities well within the limits of most application requirements.

OPW swivel joints are available in two types of body construction – cast and fabricated – which differ in appearance. For illustrative purposes only, most of the drawings featured on the following pages are the "fabricated type."

A rotary manifold board uses OPW Engineered Systems' swivel joints and dry disconnect fittings to clean up messy hose exchange areas in blending and similar operations.



NOTE: Flanged or butt weld ends are available in many styles and sizes. Only the most common styles of OPW swivel joints appear on the following pages. If you don't see exactly what you need, please contact us.

Style 20

Thread x Thread Style 20

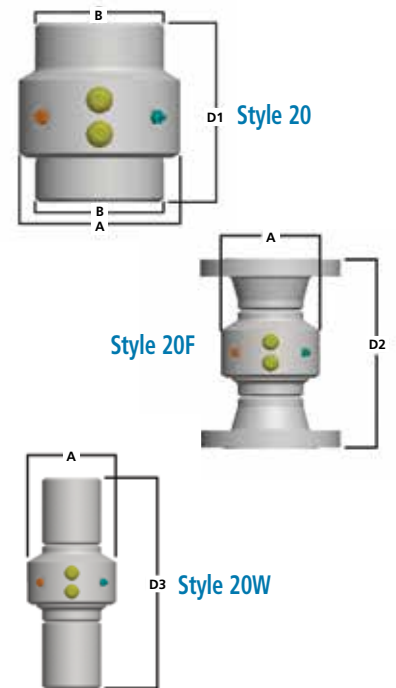
| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|--------------------|------------|
| Steel, Cast, High Pressure | 3220 | 1, 1-1/4, 1-1/2, 2 | ▲ |
| Steel, Fabricated | 3420 | 2, 3, 4 | ▲ |
| Stainless Steel, Cast | 3720 | 3/4, 1, 1-1/2 | ▲ |
| Stainless Steel, Fabricated | 3920 | 2, 3, 4 | ▲ |
| Aluminum | 3620 | 1, 1-1/2, 2, 3, 4 | ● |
| Ductile Iron | 3820 | 1, 1-1/2, 2, 3, 4 | ● |
| Bronze | 3320 | 1, 1-1/2, 2, 3 | ● |

Flange x Flange Style 20F

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3420F | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3920F | 2, 3, 4, 6, 8, 10 | ▲ |
| Aluminum | 3620F | 3, 4, 6 | ● |

Butt Weld x Butt Weld Style 20W

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3420W | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3920W | 2, 3, 4, 6, 8, 10 | ▲ |



Style 30

Thread x Thread Style 30

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|--------------------|------------|
| Steel, Cast, High Pressure | 3230 | 1, 1-1/4, 1-1/2, 2 | ▲ |
| Steel, Fabricated | 3430 | 2, 3, 4 | ▲ |
| Stainless Steel, Cast | 3730 | 3/4, 1, 1-1/2 | ▲ |
| Stainless Steel, Fabricated | 3930 | 2, 3, 4 | ▲ |
| Aluminum | 3630 | 1, 1-1/2, 2, 3, 4 | ● |
| Ductile Iron | 3830 | 1, 1-1/2, 2, 3, 4 | ● |
| Bronze | 3330 | 1, 1-1/2, 2, 3 | ● |

Flange x Flange Style 30F

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3430F | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3930F | 2, 3, 4, 6, 8, 10 | ▲ |
| Aluminum | 3630F | 3, 4, 6 | ● |
| Ductile Iron | 3830F | 3, 4 | ● |

Flange for Submerged Use Style 30FJ

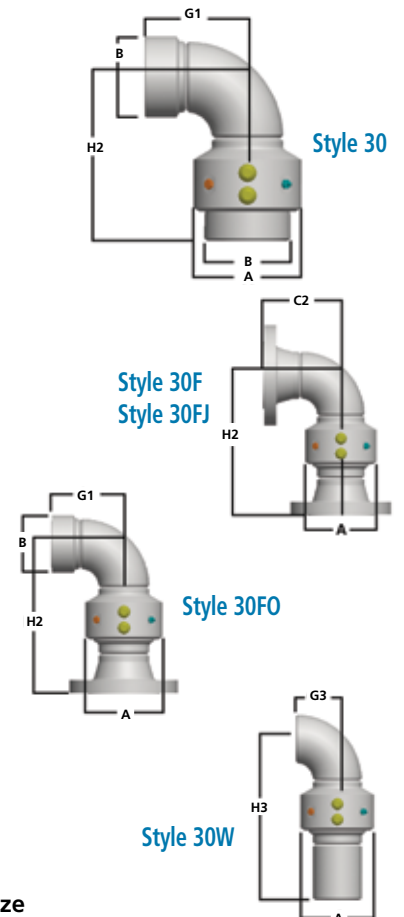
| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|-------------------|------------|
| Steel, Fabricated | 3430FJ | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3930FJ | 2, 3, 4, 6, 8, 10 | ▲ |
| Aluminum | 3630FJ | 3, 4, 6 | ● |

Flange x Thread Style 30FO

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|---------------|------------|
| Steel, Fabricated | 3430FO | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3930FO | 2, 3, 4 | ▲ |
| Aluminum | 3630FO | 3, 4 | ● |
| Ductile Iron | 3830FO | 3, 4 | ● |

Butt Weld x Butt Weld Style 30W

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3430W | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3930W | 2, 3, 4, 6, 8, 10 | ▲ |



Dimensions Chart on page 20: ▲ Steel & Stainless Steel ● Aluminum, Ductile Iron & Bronze

Style 34

Thread x Thread Style 34

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3434 | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3934 | 2, 3, 4 | ▲ |

Flange x Flange Style 34F

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3434F | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3934F | 2, 3, 4 | ▲ |

Style 35

Thread x Thread Style 35

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3435 | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3935 | 2, 3, 4 | ▲ |
| Aluminum | 3635 | 3, 4 | ● |

Flange x Flange Style 35F

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3435F | 2, 3, 4, 6 | ▲ |
| Stainless Steel, Fabricated | 3935F | 2, 3, 4, 6 | ▲ |

TTMA Truck Flanges Style 35FT

| Material | Model | Size (inches) | Dimensions |
|----------|---------|---------------|------------|
| Aluminum | 3635FT | 4 | ● |
| Aluminum | 3635FT* | 4 | ● |

*Comes complete with straight pipe handle.

Style 40

Thread x Thread Style 40

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|--------------------|------------|
| Steel, Cast, High Pressure | 3240 | 1, 1-1/4, 1-1/2, 2 | ▲ |
| Steel, Fabricated | 3440 | 2, 3, 4 | ▲ |
| Stainless Steel, Cast | 3740 | 3/4, 1, 1-1/2 | ▲ |
| Stainless Steel, Fabricated | 3940 | 2, 3, 4 | ▲ |
| Aluminum | 3640 | 1, 1-1/2, 2, 3, 4 | ● |
| Ductile Iron | 3840 | 1, 1-1/2, 2, 3, 4 | ● |
| Bronze | 3340 | 1, 1-1/2, 2, 3 | ● |

Flange x Flange Style 40F

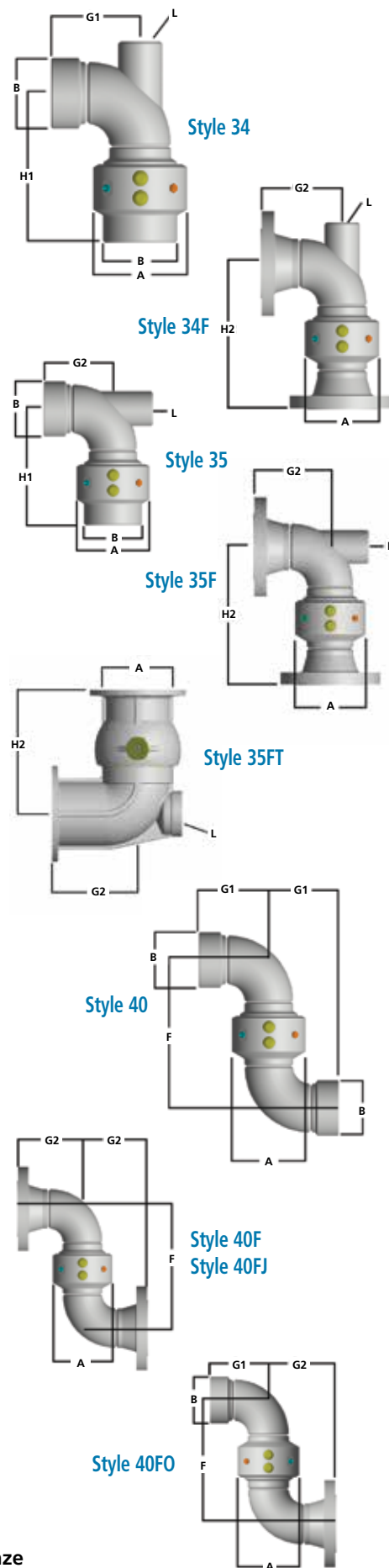
| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3440F | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3940F | 2, 3, 4, 6, 8, 10 | ▲ |
| Aluminum | 3640F | 3, 4, 6 | ● |
| Ductile Iron | 3840F | 3, 4 | ● |

Flanged for Submerged Use Style 40FJ

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|-------------------|------------|
| Steel, Fabricated | 3440FJ | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3940FJ | 2, 3, 4, 6, 8, 10 | ▲ |
| Aluminum | 3640FJ | 2, 3, 4, 6 | ● |

Flange x Thread Style 40FO

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|---------------|------------|
| Steel, Fabricated | 3440FO | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3940FO | 2, 3, 4 | ▲ |
| Aluminum | 3640FO | 3, 4 | ● |
| Ductile Iron | 3840FO | 3, 4 | ● |



Dimensions Chart on page 20: ▲ Steel & Stainless Steel ● Aluminum, Ductile Iron & Bronze

Style 40 (CONTINUED)

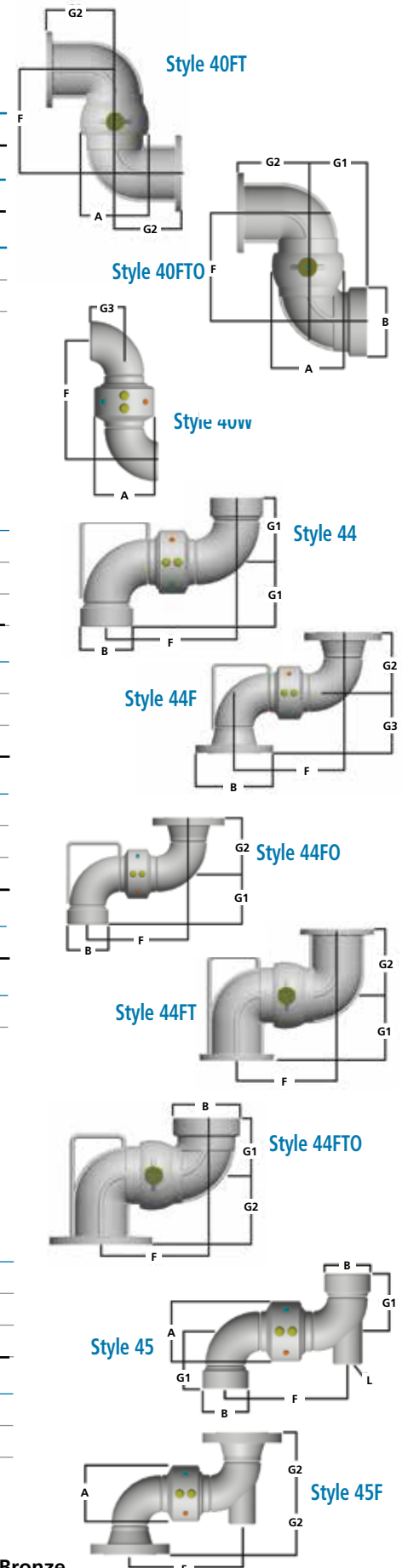
| | | | | |
|---------------------------------------------------|-----------------------------|--------------|----------------------|-------------------|
| TTMA Truck Flange Style 40FT | Material | Model | Size (inches) | Dimensions |
| | Aluminum | 3640FT | 3, 4 | ● |
| TTMA Truck Flange x Thread Style 40FTO | Material | Model | Size (inches) | Dimensions |
| | Aluminum | 3640FTO | 3, 4 | ● |
| Butt Weld x Butt Weld Style 40W | Material | Model | Size (inches) | Dimensions |
| | Steel, Fabricated | 3440W | 2, 3, 4, 6, 8, 10 | ▲ |
| | Stainless Steel, Fabricated | 3940W | 2, 3, 4, 6, 8, 10 | ▲ |

Style 44 (LOADING ARM DROP TUBE SWIVEL WITH GRASP HANDLE)

| | | | | |
|-------------------------------------------------------|-----------------------------|--------------|----------------------|-------------------|
| Thread x Thread Style 44 | Material | Model | Size (inches) | Dimensions |
| | Steel, Fabricated | 3444 | 2, 3, 4 | ▲ |
| | Stainless Steel, Fabricated | 3944 | 2, 3, 4 | ▲ |
| | Aluminum | 3644 | 2, 3, 4 | ● |
| Flange x Flange Style 44F | Material | Model | Size (inches) | Dimensions |
| | Steel, Fabricated | 3444F | 2, 3, 4 | ▲ |
| | Stainless Steel, Fabricated | 3944F | 2, 3, 4 | ▲ |
| | Aluminum | 3644F | 3, 4, 6 | ● |
| Flange x Thread Style 44FO | Material | Model | Size (inches) | Dimensions |
| | Steel, Fabricated | 3444FO | 2, 3, 4 | ▲ |
| | Stainless Steel, Fabricated | 3944FO | 2, 3, 4 | ▲ |
| | Aluminum | 3644FO | 3, 4 | ● |
| TTMA Truck Flange Style 44FT | Material | Model | Size (inches) | Dimensions |
| | Aluminum | 3644FT | 3, 4 | ● |
| TTMA Truck Flange x Thread Style 44FTO | Material | Model | Size (inches) | Dimensions |
| | Aluminum | 3644FTO | 3, 4 | ● |

Style 45

| | | | | |
|--------------------------------------|-----------------------------|--------------|----------------------|-------------------|
| Thread x Thread Style 45 | Material | Model | Size (inches) | Dimensions |
| | Steel, Fabricated | 3445 | 2, 3, 4 | ▲ |
| | Stainless Steel, Fabricated | 3945 | 2, 3, 4 | ▲ |
| | Aluminum | 3645 | 3, 4 | ● |
| Flange x Flange Style 45F | Material | Model | Size (inches) | Dimensions |
| | Steel, Fabricated | 3445F | 2, 3, 4, 6 | ▲ |
| | Stainless Steel, Fabricated | 3945F | 2, 3, 4, 6 | ▲ |



Dimensions Chart on page 20: ▲ Steel & Stainless Steel ● Aluminum, Ductile Iron & Bronze

Style 50

Thread x Thread Style 50

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|----------------|------------|
| Steel Cast, High Pressure | 3250 | 1, 1-1/2, 2 | ▲ |
| Steel, Fabricated | 3450 | 2, 3, 4 | ▲ |
| Stainless Steel, Cast | 3750 | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3950 | 2, 3, 4 | ▲ |
| Aluminum | 3650 | 1-1/2, 2, 3, 4 | ● |
| Ductile Iron | 3850 | 2, 3, 4 | ● |

Flange x Flange Style 50F

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3450F | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3950F | 2, 3, 4, 6, 8, 10 | ▲ |
| Aluminum | 3650F | 3, 4 | ● |
| Ductile Iron | 3850F | 3, 4 | ● |

Flange x Thread Style 50FO

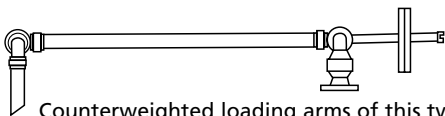
| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|---------------|------------|
| Steel, Fabricated | 3450FO | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3950FO | 2, 3, 4 | ▲ |
| Aluminum | 3650FO | 3, 4 | ● |
| Ductile Iron | 3850FO | 3, 4 | ● |

TTMA Truck Flange Style 50FT

| Material | Model | Size (inches) | Dimensions |
|----------|--------|---------------|------------|
| Aluminum | 3650FT | 3, 4 | ● |

Butt Weld x Butt Weld Style 50W

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3450W | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3950W | 2, 3, 4, 6, 8, 10 | ▲ |



Counterweighted loading arms of this type use basic Style 55 inlet swivels. Style 55FO inlet swivel is shown. Aluminum swivels are not recommended for this application.

Style 55

Thread x Thread Style 55

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3455 | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3955 | 2, 3, 4 | ▲ |
| Aluminum | 3655 | 3, 4 | ● |
| Ductile Iron | 3855 | 2, 3 | ● |

Flange x Flange Style 55F

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3455F | 2, 3, 4, 6 | ▲ |
| Stainless Steel, Fabricated | 3955F | 2, 3, 4, 6 | ▲ |

Flange x TTMA Truck Flange Style 55FFT

| Material | Model | Size (inches) | Dimensions |
|-------------------|---------|---------------|------------|
| Steel, Fabricated | 3455FFT | 3, 4 | ▲ |
| Ductile Iron | 3855FFT | 3 | ● |

Flange x Thread Style 55FO

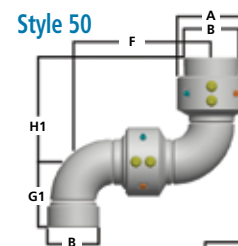
| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|---------------|------------|
| Steel, Fabricated | 3455FO | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3955FO | 2, 3, 4 | ▲ |
| Aluminum | 3655FO | 3, 4 | ● |
| Ductile Iron | 3855FO | 3 | ● |

TTMA Truck Flange Style 55FT

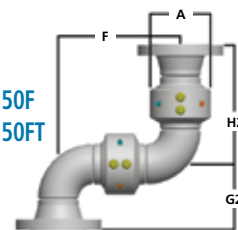
| Material | Model | Size (inches) | Dimensions |
|----------|--------|---------------|------------|
| Aluminum | 3655FT | 4 | ● |

Thread x TTMA Truck Flange Style 55TFT

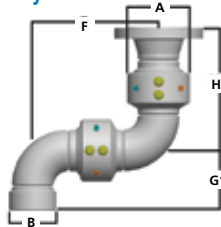
| Material | Model | Size (inches) | Dimensions |
|--------------|---------|---------------|------------|
| Ductile Iron | 3855TFT | 3 | ● |



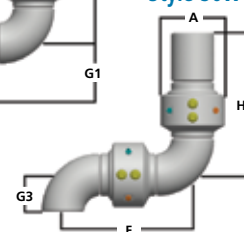
Style 50F
Style 50FT



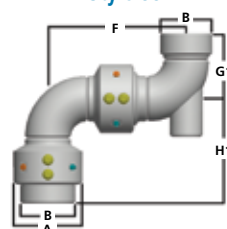
Style 50FO



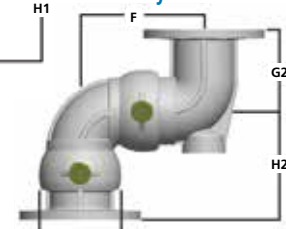
Style 50W



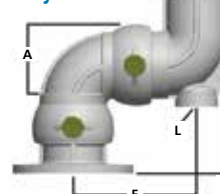
Style 55



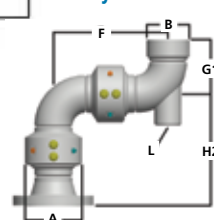
Style 55F
Style 55FT



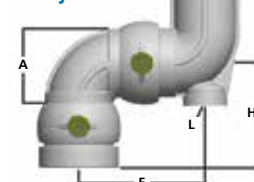
Style 55FFT



Style 55FO



Style 55TFT



Dimensions Chart on page 20: ▲ Steel & Stainless Steel ● Aluminum, Ductile Iron & Bronze

Style 60

Thread x Thread Style 60

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|----------------|------------|
| Steel Cast, High Pressure | 3260 | 1, 1-1/2, 2 | ▲ |
| Steel, Fabricated | 3460 | 2, 3, 4 | ▲ |
| Stainless Steel, Cast | 3760 | 1, 1 1/2 | ▲ |
| Stainless Steel, Fabricated | 3960 | 2, 3, 4 | ▲ |
| Aluminum | 3660 | 1-1/2, 2, 3, 4 | ● |
| Ductile Iron | 3860 | 2, 3, 4 | ● |

Flange x Flange Style 60F

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3460F | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3960F | 2, 3, 4, 6, 8, 10 | ▲ |
| Aluminum | 3660F | 3, 4 | ● |
| Ductile Iron | 3860F | 3, 4 | ● |

Flange x Thread Style 60FO

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|---------------|------------|
| Steel, Fabricated | 3460FO | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3960FO | 2, 3, 4 | ▲ |
| Aluminum | 3660FO | 3, 4 | ● |
| Ductile Iron | 3860FO | 3, 4 | ● |

Thread x Thread, with Drilled Boss Style 60T

| Material | Model | Size (inches) | Dimensions |
|--------------|-------|---------------|------------|
| Ductile Iron | 3860T | 2 | ● |
| Bronze | 3360T | 1-1/2, 2 | ● |

Butt Weld x Butt Weld Style 60W

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3460W | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3960W | 2, 3, 4, 6, 8, 10 | ▲ |

Style 70

Thread x Thread Style 70

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|----------------|------------|
| Steel, Cast, High Pressure | 3270 | 1, 1-1/2, 2 | ▲ |
| Steel, Fabricated | 3470 | 2, 3, 4 | ▲ |
| Stainless Steel, Cast | 3770 | 1, 1-1/2 | ▲ |
| Stainless Steel, Fabricated | 3970 | 2, 3, 4 | ▲ |
| Aluminum | 3670 | 1-1/2, 2, 3, 4 | ▲ |
| Ductile Iron | 3870 | 2, 3, 4 | ● |

Flange x Flange Style 70F

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3470F | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3970F | 2, 3, 4, 6, 8, 10 | ▲ |
| Aluminum | 3670F | 3, 4 | ● |
| Ductile Iron | 3860F | 3, 4 | ● |

Flange x Thread Style 70FO

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|---------------|------------|
| Steel, Fabricated | 3470FO | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3970FO | 2, 3, 4 | ▲ |
| Aluminum | 3670FO | 3, 4 | ● |
| Ductile Iron | 3870FO | 3, 4 | ● |

TTMA Truck Flange Style 70FT

| Material | Model | Size (inches) | Dimensions |
|----------|--------|---------------|------------|
| Aluminum | 3670FT | 3, 4 | ● |

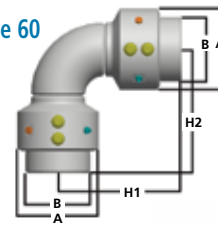
TTMA Truck Flange x Thread Style 70FTO

| Material | Model | Size (inches) | Dimensions |
|----------|---------|---------------|------------|
| Aluminum | 3670FTO | 3 | ● |

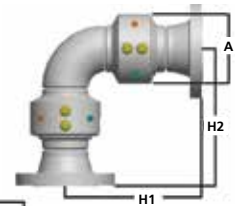
Butt Weld x Butt Weld Style 70W

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3470W | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3970W | 2, 3, 4, 6, 8, 10 | ▲ |

Style 60



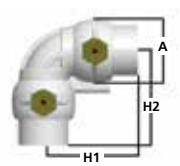
Style 60F
Style 60FT



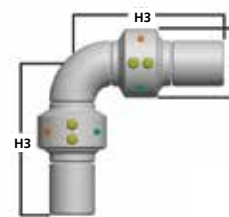
Style 60FO



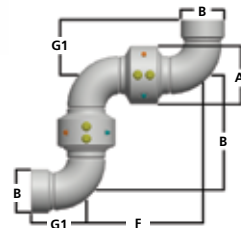
Style 60T



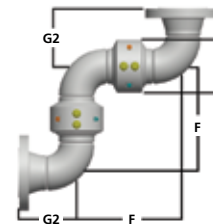
Style 60W



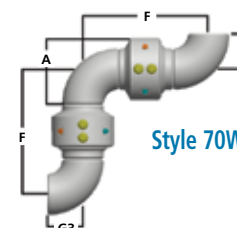
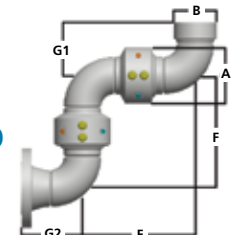
Style 70



Style 70F
Style 70FT



Style 70FO
Style 70FTO



Dimensions Chart on page 20: ▲ Steel & Stainless Steel ● Aluminum, Ductile Iron & Bronze

Style 80*

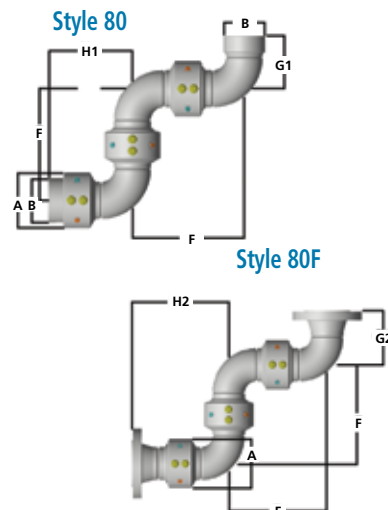
Thread x Thread Style 80

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3480 | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3980 | 2, 3, 4 | ▲ |

Flange x Flange Style 80F

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3480F | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3980F | 2, 3, 4, 6, 8, 10 | ▲ |

*Flange x Thread (Style 80FO) and Butt Weld x Butt Weld (Style 80W) units are also available.



Style 10*

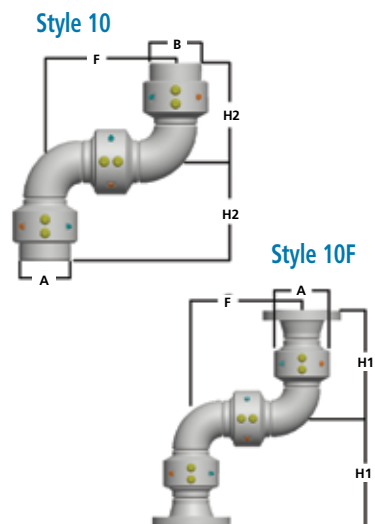
Thread x Thread Style 10

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3410 | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3910 | 2, 3, 4 | ▲ |

Flange x Flange Style 10F

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3410F | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3910F | 2, 3, 4, 6, 8, 10 | ▲ |

*Flange x Thread (Style 10FO) and Butt Weld x Butt Weld (Style 10W) units are also available.



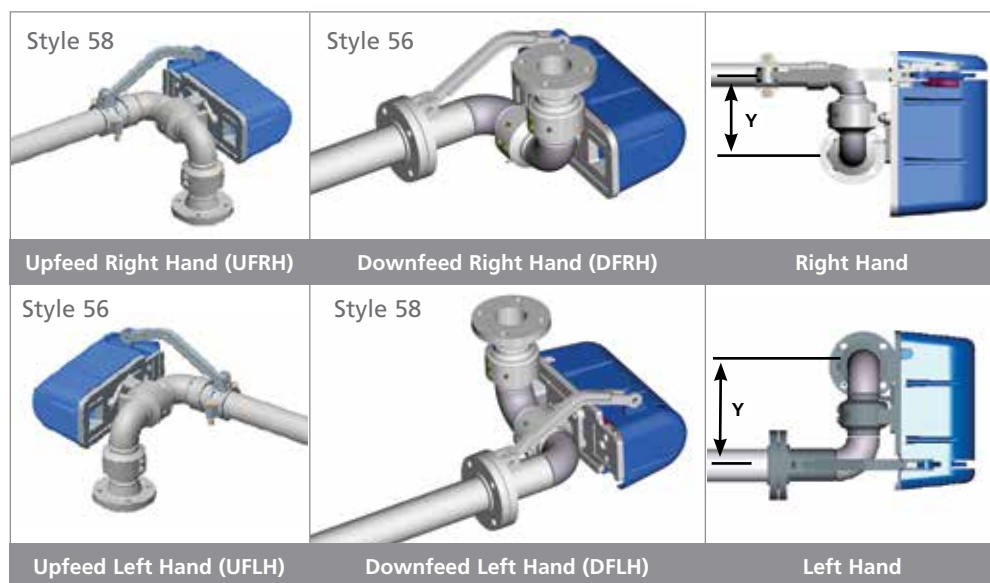
Dimensions Chart on page 20: ▲ Steel & Stainless Steel ● Aluminum, Ductile Iron & Bronze

Counterbalance Swivels

OPW Engineered Systems' counterbalance swivels for both counterweighted loading arms (see Style 55 on page 10) and torsion spring-balanced loading arms (Styles 56, 58, 76 and 78) are available to cover virtually any combination of riser orientation and swivel offset, including:

- Upfeed right hand
- Upfeed left hand
- Downfeed right hand
- Downfeed left hand

If you are uncertain as to which counterbalance replacement swivel to order, refer to your original loading arm design drawing or contact the OPW Engineered Systems' engineering department.



OPW Style 790 counterbalance swivel in upfeed right hand (UFRH) configuration shown.

Maximum Y-dimensions: 2" size: Y= 8-1/8" (207 mm); 3" size: Y=11" (280 mm); 4" size: Y=12" (324 mm); and 6" size: Y=18" (470 mm).

Style 56

Thread x Thread
Style 56 (DFRH, UFLH)**

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3456 | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3956 | 2, 3, 4 | ▲ |
| Ductile Iron | 3856 | 3, 4 | ● |

Flange x Flange
Style 56F (DFRH*)**

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3456F | 2, 3, 4, 6 | ▲ |
| Stainless Steel, Fabricated | 3956F | 2, 3, 4, 6 | ▲ |

Flange x TTMA Flange
Style 56FFT (DFRH*)**

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|---------|---------------|------------|
| Steel, Fabricated | 3456FFT | 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3956FFT | 3, 4 | ▲ |

Flange x Thread
Style 56FO (DFRH, UFLH)**

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|---------------|------------|
| Steel, Fabricated | 3456FO | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3956FO | 2, 3, 4 | ▲ |
| Ductile Iron | 3856FO | 2, 3, 4 | ● |

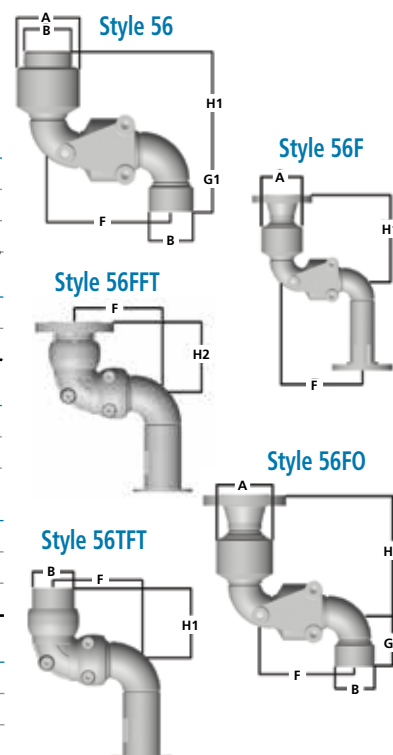
Thread x TTMA Flange
Style 56TFT (DFRH*)**

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|---------|---------------|------------|
| Steel, Fabricated | 3456TFT | 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3956TFT | 3, 4 | ▲ |

*Left hand model available on special order. Consult factory.

** Must specify if Downfeed.

Dimensions Chart on page 20: ▲ Steel & Stainless Steel ● Aluminum, Ductile Iron & Bronze



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Style 58

Thread x Thread

Style 58 (UFRH, DFLH)*

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3458 | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3958 | 2, 3, 4 | ▲ |
| Ductile Iron | 3858 | 2, 3, 4 | ● |

Flange x Flange

Style 58F (UFRH)*

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|-------------------|------------|
| Steel, Fabricated | 3458F | 2, 3, 4, 6, 8, 10 | ▲ |
| Stainless Steel, Fabricated | 3958F | 2, 3, 4, 6, 8, 10 | ▲ |

Flange x TTMA Flange

Style 58FFT (UFRH)*

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|---------|---------------|------------|
| Steel, Fabricated | 3458FFT | 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3958FFT | 3, 4 | ▲ |

Flange x Thread

Style 58FO (UFRH, DFLH)*

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|---------------|------------|
| Steel, Fabricated | 3458FO | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3958FO | 2, 3, 4 | ▲ |
| Ductile Iron | 3858FO | 3, 4 | ● |

Thread x TTMA Flange

Style 58TFT (UFRH)*

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|---------|---------------|------------|
| Steel, Fabricated | 3458TFT | 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3958TFT | 3, 4 | ▲ |

* Must specify if Downfeed.

Style 76

Flange x Flange

Style 76F (UFLH)**

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3476F | 3, 4, 6 | ▲ |
| Stainless Steel, Fabricated | 3976F | 3, 4, 6 | ▲ |

Flange x TTMA Flange

Style 76FFT (UFLH)**

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|---------|---------------|------------|
| Steel, Fabricated | 3476FFT | 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3976FFT | 3, 4 | ▲ |

Flange x Thread

Style 76FO (DFRH, UFLH)**

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|---------------|------------|
| Steel, Fabricated | 3476FO | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3976FO | 2, 3, 4 | ▲ |
| Ductile Iron | 3876FO | 3, 4 | ● |

Style 78

Flange x Flange

Style 78F (UFRH*)**

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|-------|---------------|------------|
| Steel, Fabricated | 3478F | 2, 3, 4, 6 | ▲ |
| Stainless Steel, Fabricated | 3978F | 2, 3, 4, 6 | ▲ |

Flange x TTMA Flange

Style 78FFT (UFRH*)**

| Material | Model | Size (inches) | Dimensions |
|-----------------------------|---------|---------------|------------|
| Steel, Fabricated | 3478FFT | 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3978FFT | 3, 4 | ▲ |

Flange x Thread

Style 78FO (UFRH, DFLH)**

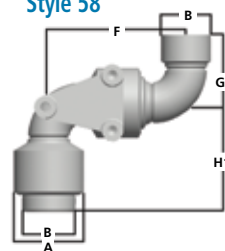
| Material | Model | Size (inches) | Dimensions |
|-----------------------------|--------|---------------|------------|
| Steel, Fabricated | 3478FO | 2, 3, 4 | ▲ |
| Stainless Steel, Fabricated | 3978FO | 2, 3, 4 | ▲ |
| Ductile Iron | 3878FO | 3, 4 | ● |

* Left hand model available on special order. Consult factory.

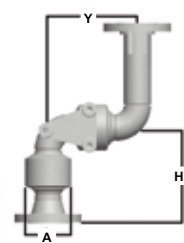
** Must specify if Downfeed.

Dimensions Chart on page 20: ▲ Steel & Stainless Steel ● Aluminum, Ductile Iron & Bronze

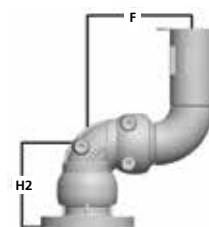
Style 58



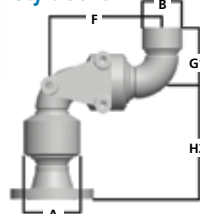
Style 58F



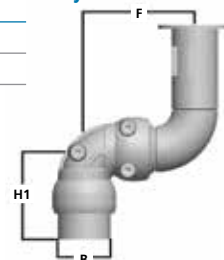
Style 58FFT



Style 58FO

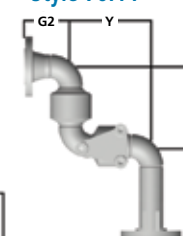


Style 58TFT

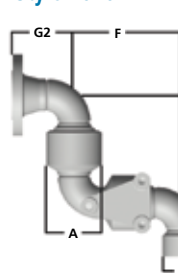


Style 76F

Style 76FFT

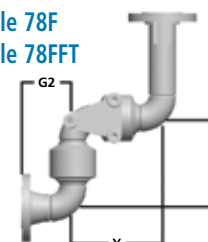


Style 76FO

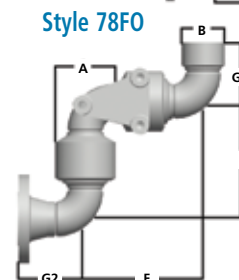


Style 78F

Style 78FFT



Style 78FO



Specialty Applications

Specialty Swivel Joints

OPW Engineered Systems specializes in the custom design and manufacture of swivel joints for special applications, including but not limited to:

- Hose reels
- Highway construction machinery
- Fire fighting equipment
- Machine tools
- Filtration equipment
- Aviation ground support equipment
- Tank trucks
- Plastics machinery
- Drum fillers
- Hydraulics

OPW engineers can help you determine the appropriate design for your special application by providing experienced consultation backed up by the right swivel design, tailored specifically to meet your application needs. OPW specialty swivels are available in a wide range of materials and sizes. Please contact the OPW Engineered Systems' engineering department for assistance with your selection.



Hose Reel/Victaulic® Swivels

Thread x Victaulic®
Groove Style 20VO

| Material | Model | Size | Dimensions |
|-----------|---------|--------------------------|----------------|
| Aluminum | 2620-VO | 1-1/2" x 2" | Use 1-1/2" |
| Cast Iron | 2820-VO | 1-1/2" x 2", 2" x 2" | Use 1-1/2", 2" |
| Aluminum | 3620-VO | 1-1/2" x 2", 2" x 2-1/2" | Use 1-1/2", 2" |

Thread x Victaulic®
Groove Style 30VO

| Material | Model | Size | Dimensions |
|-----------|---------|----------------------|----------------|
| Aluminum | 2630-VO | 1-1/2" x 2" | Use 1-1/2" |
| Cast Iron | 2830-VO | 1-1/2" x 2", 2" x 2" | Use 1-1/2", 2" |
| Aluminum | 3630VO | 2", 3", 4" | Use 2", 3", 4" |
| Aluminum | 3630VOG | 1-1/2" x 2" | Use 1-1/2" |

Available in Buna-N or Viton® seals.

Thread x Victaulic®
Groove Style 3637VO

| Material | Model | Size | Dimensions |
|----------|--------|---------|------------|
| Aluminum | 3637VO | 3" x 3" | see below* |

*A = 6-1/4" (159 mm); G1 = 3-7/8" (99 mm); H1 = 6-1/8" (156 mm)

OPW 3637VO is a 90° hose reel swivel with glass filament wound composite. Teflon® lined, sleeve-type bearings (not ball bearings). Available with Buna-N seals only. Pressure rating is 125 psi (9 kg/cm²). Also available in straight version: OPW 3627VO.

Style 20VO



Style 30VO



Style 3637VO

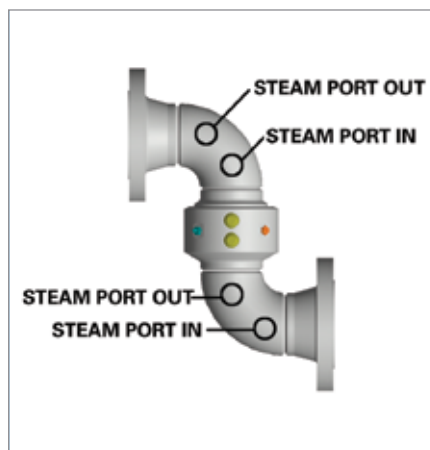


Jacketed Swivel Joints

Any of OPW Engineered Systems' fabricated steel or stainless-steel swivels can be ordered jacketed. Jacketed swivels are commonly used in applications where relatively high temperatures must be maintained, such as asphalt, sulfur, waxes and resins.

OPW jacketed swivels feature full steel jackets on the elbow portions only. Conductive heat from the jacketed elbows of the swivel joint provides sufficient heat to the seal area, which is generally field-insulated. For applications considered highly critical, the seal area of the joint can also be jacketed. Standard steam connections are 3/4" FNPT.

Mediums other than steam can also be re-circulated through OPW jacketed swivels to heat or cool products, such as oil, water and glycol, among others.



Dimensions Chart on page 20: ▲ Steel & Stainless Steel ● Aluminum, Ductile Iron & Bronze

ENDURA™ Dual Split Flange Swivels (8400 and 8900 Series)

The OPW Engineered Systems' ENDURA™ swivel line represents leading innovation in swivel technology. Specifically designed for the transfer of hazardous materials such as LPG, acids, solvents, petrochemicals and other toxic fluids, ENDURA™ sets the industry standard in swivel performance and cost-effective operation. Featuring heavy-duty flanged construction and available in a variety of materials.

Benefits

Endurance –

heavy-duty construction and unique design features result in long-life, hassle-free performance.

Smooth, Easy Operation –

the sealed, one-piece deep-groove dual ball bearing assembly ensures smooth and easy rotation.

Improves Uptime Performance –

the simple, three-piece design allows for the quickest and easiest disassembly and repair in the industry, which means less downtime, less labor and less cost.

Lowest Overall Cost of Ownership –

heavy-duty construction ensures long-life reliability while the unique design features allow for cost-effective preventive maintenance servicing and the easiest, most cost-effective seal and bearing replacement of any swivel. Optimized performance, downtime prevention, and reduced maintenance time and costs make this the best overall swivel value in the industry.

Ordering Chart see Page 23.



Features

360° Rotation –

full range of motion for ease of use.

Deep-Groove Replaceable Dual Ball Bearing Technology –

a precision-engineered, one-piece, ball bearing assembly eliminates the need for individual balls. If required, bearing replacement is quick and easy; simply replace the old bearing chamber with a new one. The ENDURA™ DSF 8900 Series features a 316 Stainless Steel replaceable dual ball bearing chamber.

Redundant Seal System –

incorporates a main seal, back-up seal, environmental seal and leak detection. If the main seal ever leaks due to normal wear, the back-up seal contains the fluid. Leakage is then channeled to a leak detection port in the side of the swivel to provide a visual indicator that service is required so the seals can be replaced. The environmental seal provides a third layer of protection, preventing liquid from entering the environment. Seal materials include Buna-N, Viton®, EPT, Kalrez®, Chemraz®, Silicone, and Food Grade.

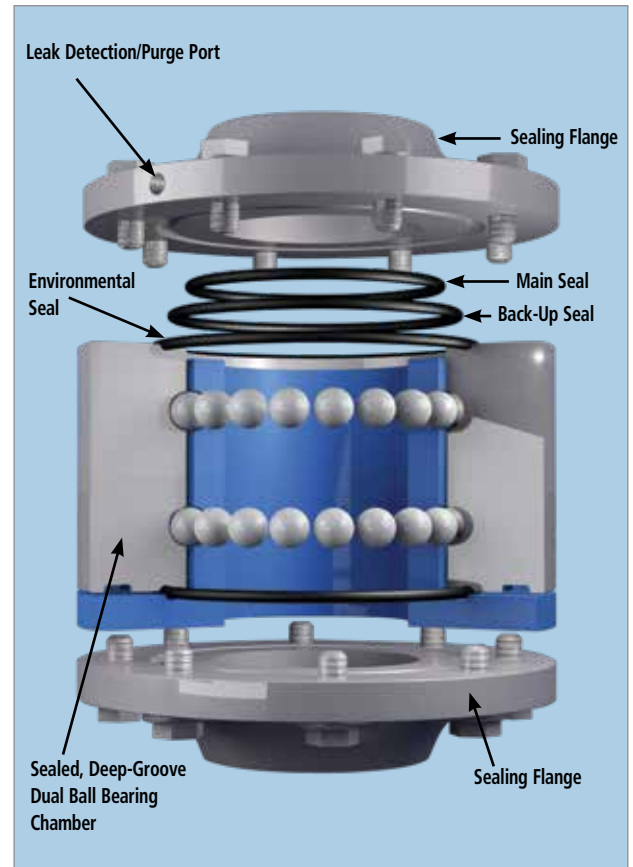
Built-In Leak Detection –

a visual indicator, in the form of a leak detection port in the side of the swivel provides a quick and easy way to monitor seal leakage so preventive maintenance can be performed before a problem arises. The leak detection port also can serve as a purge port, permitting use of a blanket of inert gas to prevent product from escaping into the environment.

Versatility –

available in 2", 3" and 4" sizes, and in a variety of construction materials, including carbon steel, stainless steel, Hastelloy®, Alloy20®, Monel® and other exotics.

500 PSI Pressure Rating



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Repair Parts And Procedures

Seal Replacement Kits

OPW Engineered Systems has kits available to rebuild all swivel joints. The kits contain all the necessary parts to replace the wear parts. Before installing new seals, care should be taken to see that all machined surfaces are clean and that there are no nicks, scratches or burrs. Consult your local distributor for the proper kit.

| Seal Material | Kit No. |
|--------------------|-------------|
| Buna-N | 3000RK-0X01 |
| Fluorocarbon | 3000RK-0X02 |
| PFA-Silicone | 3000RK-0X03 |
| EPDM | 3000RK-0X04 |
| Food Grade Nitrile | 3000RK-0X05 |
| X = Swivel Size | |

Lubricants

OPW swivel joints should be lubricated periodically, depending on service and operating conditions. For normal operation, annually is sufficient. Frequent lubricating may be required when service is severe, such as high temperatures, heavy loads, or constant rotation.

| Part # | Description |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 880-0089 | High Performance Synthetic Lubricant 14 oz. (400 grams) cartridge <ul style="list-style-type: none"> Specially formulated to reduce friction and wear Requires only annual lubrication Not for use with EPT/EPDM seals Will not drip, melt or carbonize Complies with FDA regulation 21CFR178.3570 Temperature range -40°F - 750°F (-40°C - 398.8°C) |
| 885-0083 | High Performance Synthetic Lubricant for EPT Seals |

Warning: EPT/EPDM Seals require the use of OPW 885-0083 or a non-petroleum based lubricant.

Ball Bearings

Both steel and stainless steel ball bearings are available for all OPW swivels. Each swivel plane of rotation has two races; quantities shown below are per pair of races.

| Size (inches) | No. Balls Per Pair of Races | Part No. Steel Balls | Part No. Stainless Balls |
|---------------|-----------------------------|-----------------------|--------------------------|
| 3/4 & 1 | 40 | H-7063-M ¹ | H-30035-M |
| 1-1/4 & 1-1/2 | 56 | H-7063-M ¹ | H-30035-M |
| 2 | 48 | H-6712-M ² | H-1171-M |
| 3 | 66 | H-6712-M | H-1171-M |
| 4 | 84 | H-6712-M | H-1171-M |
| 6 | 76 | H-6780-M | H-30036-M |
| 8 | 98 | H-6780-M | H-30036-M |
| 10 | 98 | H-30162-M | H-30147-M |

¹3200 Series swivels use H-4577-M balls. ²3200 Series swivels use H-4576-M balls.

Flange Dimensions

| Type | Size (inches) | Flange O.D. | | Bolt Circle | | No. Bolt Holes | Bolt Dia. | |
|--------------|---------------|-------------|-------|-------------|-------|----------------|-----------|------|
| | | in, | (mm) | in, | (mm) | | in, | (mm) |
| 150 lb. ASME | 2 | 6 | (153) | 4-3/4 | (121) | 4 | 5/8 | (16) |
| 150 lb. ASME | 3 | 7-1/2 | (191) | 6 | (153) | 4 | 5/8 | (16) |
| TTMA | 3 | 5-5/8 | (143) | 4-7/8 | (124) | 8 | 3/8 | (10) |
| 150 lb. ASME | 4 | 9 | (229) | 7-1/2 | (191) | 8 | 5/8 | (16) |
| TTMA | 4 | 6-5/8 | (169) | 5-7/8 | (150) | 8 | 3/8 | (10) |
| 150 lb. ASME | 6 | 11 | (280) | 9-1/2 | (150) | 8 | 3/4 | (19) |
| 150 lb. ASME | 8 | 13-1/2 | (343) | 11-3/4 | (242) | 8 | 3/4 | (19) |
| 150 lb. ASME | 10 | 16 | (407) | 17 | (432) | 12 | 7/8 | (22) |

Note: 300 lb., 600 lb., and other types of flanges are available on special order. Consult factory.

Dimensions

▲ Steel & Stainless Steel – U.S. (inches)

All dimensions are based on short radius elbows in 3/4" to 4" sizes; long radius elbows in 6", 8" and 10" sizes.

| Size | A | B | D1 | D2 | D3 | F | G1 | G2 | G3 | H1 | H2 | H3 | L |
|-------|---------|---------|--------------------|---------------------|---------------------|----------------------|--------|---------|----|--------------------|-----------------------|---------------------|-------|
| 3/4 | 2-7/16 | 1-3/4 | 3-15/16 | | | | 2-1/2 | | | 3-15/16 | | | |
| 1 | 2-7/16 | 1-3/4 | 3-15/16 | | | 4-5/16 | 2-1/2 | | | 3-15/16 | | | |
| 1-1/4 | 2-15/16 | 2-5/16 | 4-5/8 | | | | 3 | | | 4-11/16 | | | |
| 1-1/2 | 2-15/16 | 2-5/16 | 4-5/8 | | | 4-3/4 | 3 | | | 4-11/16 | | | |
| 2 | 4-1/8 | 3-1/8 | 5-1/16 | 9-1/8 | 12-1/8 | 8-1/8 | 4-1/16 | 4-9/16 | 2 | 6-7/16 | 8-5/8 | 10-1/8 | 1-1/4 |
| 2 | 3-3/4 | 2-15/16 | 5-11/16 | | | 6-1/8 | 3-1/8 | | | 5-5/8 | | | |
| 3 | 5-1/8 | 4-1/4 | 5-7/8 ^a | 10-1/4 ^a | 12-3/4 ^a | 10-3/4 ^a | 5-1/16 | 5-13/16 | 3 | 8-1/8 ^a | 10-1/2 ^a | 11-3/4 ^a | 1-1/2 |
| 4 | 6-1/4 | 5-5/16 | 6-3/8 | 10-3/4 | 12-3/4 | 12-3/4 | 6-5/16 | 7-1/16 | 4 | 9-7/16 | 11-3/4 | 12-3/4 | 2 |
| 6 | 9 | | | 13-7/16 | 14-7/16 | 24-7/16 ^b | | 12-9/16 | 9 | | 18-15/16 ^c | 19-7/16 | 2 |
| 8 | 11-7/8 | | | 16 | 16 | 32 | | 16-1/16 | 12 | | 24 | 24 | |
| 10 | 13-9/16 | | | 19-1/8 | 19-1/8 | 41-1/8 | | 19-1/16 | 15 | | 30-1/8 | 30-1/8 | |

Cast High-Pressure Steel only. A=Add 1/4" for Stainless Steel units. B=21 7/16" on styles 76F and 78F. C=15 15/16" on styles 56F and 58F.

● Aluminum, Ductile Iron, & Bronze – U.S. (inches)

All dimensions are based on short radius elbows.

| Size | A | B | D1 | D2 | F | G1 | G2 | H1 | H2 | L |
|-------|---------|----------------|---------------------|---------|--------------------|-------|--------|----------------------|--------|-------|
| 1 | 2-7/16 | 1-3/4 | 4-5/16 ^d | | 4-5/16 | 2-1/2 | | 4-15/16 ^d | | |
| 1-1/2 | 2-15/16 | 2-3/8 | 4-5/8 | | 4-3/4 | 3 | | 4-11/16 | | |
| | 3-3/4 | 2-15/16 | 5-11/16 | | 6-1/8 | 3-1/8 | 5-1/2 | 5-5/8 | | 1-1/4 |
| 3 | 4-7/8 | 4 ^d | 6-5/8 | 6-5/8 | 7-5/8 ^a | 4-5/8 | 5 | 6-7/8 | 6-7/8 | 1-1/2 |
| 4 | 6-1/16 | 5 ^e | 7-3/16 | 7-5/8 | 9-1/4 | 5 | 6-1/16 | 7-11/16 | 8-1/8 | 2 |
| 6 | 9-1/8 | | | 9-15/16 | 14-1/8 | | 7-3/4 | | 12-7/8 | |

D=Aluminum is 4 11/16". E=Aluminum is 5 13/16". F=Ductile Iron is 3 15/16". G=10 3/8" on Aluminum model nos. 3640FTO and 3644FTO.

▲ Steel & Stainless Steel – Metric (mm)

All dimensions are based on short radius elbows in 3/4" to 4" sizes; long radius elbows in 6", 8" and 10" sizes.

| Size | A | B | D1 | D2 | D3 | F | G1 | G2 | G3 | H1 | H2 | H3 | L |
|--------|-----|-----|------------------|------------------|------------------|------------------|-----|-----|-----|------------------|------------------|------------------|----|
| 3/4" | 62 | 45 | 100 | | | | 64 | | | 100 | | | |
| 1" | 62 | 45 | 100 | | | 110 | 64 | | | 100 | | | |
| 1-1/4" | 75 | 59 | 118 | | | | 77 | | | 119 | | | |
| 1-1/2" | 75 | 59 | 118 | | | 121 | 77 | | | 119 | | | |
| 2" | 105 | 80 | 129 | 232 | 308 | 207 | 103 | 116 | 51 | 164 | 219 | 257 | 32 |
| 2" | 96 | 75 | 145 | | | 156 | 80 | | | 143 | | | 38 |
| 3" | 131 | 108 | 150 ^a | 261 ^a | 324 ^a | 273 ^a | 129 | 148 | 77 | | 267 ^a | 299 ^a | 51 |
| 4" | 159 | 135 | 162 | 273 | 324 | 324 | 161 | 180 | 102 | 207 ^a | 299 | 324 | 51 |
| 6" | 229 | | | 342 | 367 | 621 ^b | | 319 | 229 | 240 | 481 ^c | 494 | |
| 8" | 302 | | | 407 | 407 | 813 | | 408 | 305 | | 610 | 610 | |
| 10" | 345 | | | 486 | 486 | 1045 | | 485 | 381 | | 765 | 765 | |

Cast High-Pressure Steel only. A=Add 1/4" for Stainless Steel units. B=21 7/16" on styles 76F and 78F. C= 15 15/16" on styles 56F and 58F.

● Aluminum, Ductile Iron, & Bronze – Metric (mm)

All dimensions are based on short radius elbows.

| Size | A | B | D1 | D2 | F | G1 | G2 | H1 | H2 | L |
|--------|-----|------------------|------------------|-----|------------------|-----|-----|------------------|-----|----|
| 1" | 62 | 45 | 110 ^d | | 110 | 64 | | 126 ^d | | |
| 1-1/2" | 75 | 60 | 118 | | 121 | 77 | | 119 | | |
| 2" | 96 | 75 | 145 | | 156 | 80 | 140 | 143 | | 32 |
| 3" | 124 | 102 ^a | 169 | 169 | 194 ^a | 118 | 127 | 175 | 175 | 38 |
| 4" | 154 | 127 ^a | 183 | 194 | 235 | 127 | 154 | 196 | 207 | 51 |
| 6" | 232 | | | 253 | 359 | | 197 | | 327 | |

D=Aluminum is 4-11/16". E= Aluminum is 5-13/16". F=Ductile Iron is 3-15/16". G=10 3/8" on Aluminum model nos. 3640FTO and 3644FTO.

Approximate Weights (Except Endura™ Series)

Threaded Ends (inches)

| Style | | 3/4 & 1-1/2 | 1-1/4 & 1-1/2 | 2 | 3 | 4 |
|-------|------|-------------|---------------|----|----|----|
| 20 | lbs. | 3 lbs. | 4 | 8 | 15 | 22 |
| | kgs | 1 kg | 2 | 4 | 7 | 10 |
| 30 | lbs. | 4 lbs. | 5 | 9 | 18 | 24 |
| | kgs | 2 kg | 2 | 4 | 8 | 11 |
| 40 | lbs. | 5 lbs. | 6 | 11 | 23 | 34 |
| | kgs | 2 kg | 3 | 5 | 10 | 15 |
| 50 | lbs. | 8 lbs. | 9 | 16 | 35 | 48 |
| | kgs | 4 kg | 4 | 7 | 16 | 22 |
| 60 | lbs. | 7 lbs. | 8 | 14 | 30 | 38 |
| | kgs | 3 kg | 4 | 6 | 14 | 17 |
| 70 | lbs. | 9 lbs. | 10 | 18 | 40 | 58 |
| | kgs | 4 kg | 5 | 8 | 18 | 26 |
| 80 | lbs. | | | 22 | 50 | 70 |
| | kgs | | | 10 | 23 | 32 |
| 10 | lbs. | | | 20 | 47 | 64 |
| | kgs | | | 9 | 22 | 29 |

Flanged Ends (inches)

| Style | | 2 | 3 | 4 | 6 | 8 | 10 |
|-------|------|---------|----|-----|-----|-----|-----|
| 20F | lbs. | 20lbs. | 37 | 49 | 95 | 210 | 265 |
| | kgs | 9 kg | 17 | 22 | 43 | 95 | 120 |
| 30F | lbs. | 21 lbs. | 40 | 56 | 112 | 245 | 315 |
| | kgs | 10 kg | 18 | 25 | 51 | 111 | 143 |
| 40F | lbs. | 23 lbs. | 43 | 62 | 128 | 275 | 380 |
| | kgs | 10 kg | 20 | 28 | 58 | 125 | 172 |
| 50F | lbs. | 28 lbs. | 56 | 78 | 169 | 415 | 525 |
| | kgs | 13 kg | 25 | 35 | 77 | 188 | 238 |
| 60F | lbs. | 26 lbs. | 53 | 70 | 153 | 365 | 435 |
| | kgs | 12 kg | 24 | 32 | 69 | 166 | 197 |
| 70F | lbs. | 30 lbs. | 60 | 85 | 186 | 465 | 615 |
| | kgs | 14 kg | 27 | 39 | 84 | 211 | 279 |
| 80F | lbs. | 35 lbs. | 72 | 100 | 225 | 580 | 735 |
| | kgs | 16 kg | 33 | 45 | 102 | 263 | 33 |
| 10F | lbs. | 34 lbs. | 70 | 95 | 203 | 530 | 645 |
| | kgs | 15 kg | 32 | 43 | 92 | 240 | 293 |

Weights shown are for steel and stainless-steel swivels. Multiply table value by .30 for approximate weights of aluminum swivels. Multiply table value by .90 for approximate weights of ductile iron and bronze swivels.

Specifications

All OPW swivel joints are full bore schedule 40 construction with short radius elbows, except 6", 8" and 10" fabricated steel and stainless-steel swivels which have long radius elbows. Ball bearing raceways and sealing surfaces in all swivels are precision machined and micro-finished to ensure friction-free operation and superior sealing characteristics. All steel and ductile iron swivels are painted blue. Detailed specifications by series are as follows:

3200 Series (Cast Steel, High-Pressure)

Bodies and tails of cast 1040 carbon steel with hardened raceways. Ball bearings are precision-ground steel. Buna-N main O-ring seal with Teflon® back-up ring, and Buna-N O-ring dust seal are standard.

3300 Series (Cast Bronze)

Bodies and tails of hard, wear-resistant cast bronze (ASTM B62-83600). Precision-ground steel balls, Buna-N O-ring main seal and felt dust seal are standard. 1" size has Buna-N O-ring dust seal.

3400 Series (Fabricated Steel)

Bodies and tails of 1040 carbon steel with hardened raceways. Welded construction; 100% penetration welding by welders certified to ASME Boiler and Pressure Vessel Code, Section IX. Precision-ground steel balls, Buna-N O-ring main seal, Buna-N O-ring dust seal. Standard flanges are ASME 150 lb. raised face type.

3600 Series (Cast Aluminum)

Bodies and tails of cast A-356 high-tensile strength aluminum. Precision-ground steel balls, Buna-N O-ring main seal, and felt dust seal are standard. 1" size has Buna-N O-ring dust seal. Flanges are dimensionally compatible to ASME 150 lb. flat face configuration.

3700 Series (Cast Stainless Steel)

Bodies and tails of high quality cast ASTM A351-CF3M/CF8M stainless steel. Precision-ground stainless-steel balls, Buna-N O-ring main seal and Buna-N O-ring dust seal.

3800 Series (Cast Ductile Iron)

Bodies and tails of cast A-536 ductile iron. Precision-ground steel balls, Buna-N O-ring main seal, and felt dust seal are standard. Buna-N O-ring dust seal standard in 1" size. ASME B16.1, Class 125 dimensionally equal to 150 lb. ASME RF Flange.

3900 Series (Fabricated Stainless Steel)

Bodies and tails of high-quality ASTM A351-CF3M/CF8M stainless steel. Welded construction; 100% penetration welding by welders certified to ASME Boiler and Pressure Vessel Code, Section IX. Precision-ground stainless-steel ball bearings, Buna-N O-ring main seal, Buna-N O-ring dust seal. Standard flanges are ASME 150 lb. raised face type.

Refer to the Pressure/Temperature chart on page 5 to choose the proper seal and body material for the swivel you need.

Or, if you have a special application and are unable to locate the particular swivel you have in mind, please contact your local OPW Engineered Systems' representative or the factory for assistance.

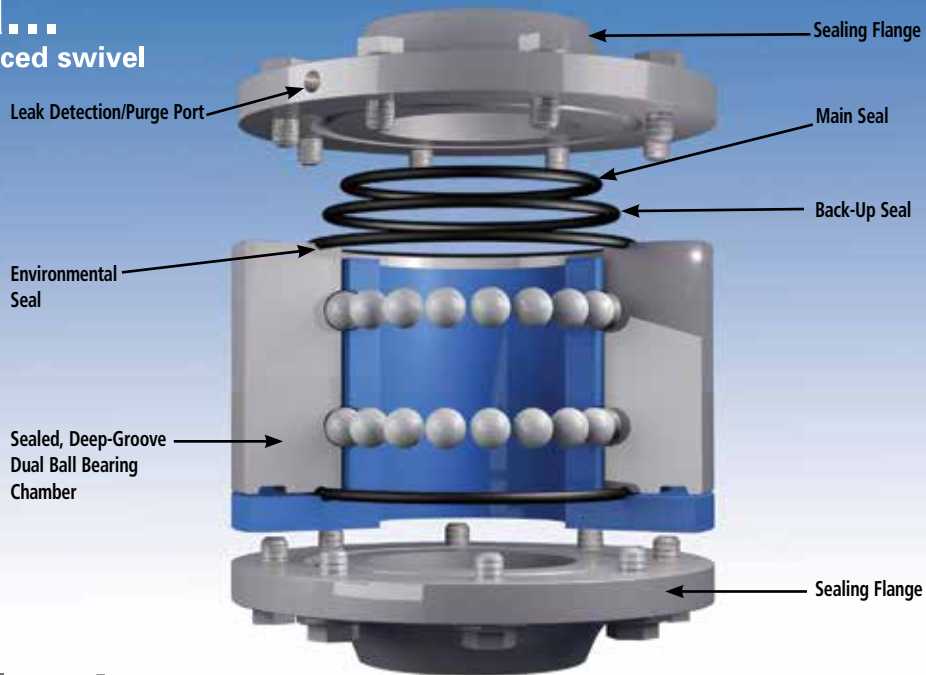
Endura...™

The world's most advanced swivel



8420F

Endura Dual Split-Flange (DSF) Swivels—360° rotation with built-in leak detection, plus durability, reliability and easy maintenance.



OPW Swivel Joints

Your guide to the industry's most complete line of swivels.

Selected Swivel Designs:

Call OPW Customer Service at 800-547-9393 for complete information on products and applications.

▼ **3730** Cast SST, Style 30, Female NPT



▶ **3910** Fabricated SST, Style 10, Female NPT



▼ **3920 F** Fabricated SST, Style 20F, 150 lb. Flange



◀ **3960 FO** Fabricated SST, Style 60FO, 150 lb. Flange x Female NPT



▶ **3740** Cast SST, Style 40, Female NPT



◀ **3970 W** Fabricated SST, Style 70W, Beveled for Welding



▶ **3630 VO** Cast Aluminum, Style 30VO, Female NPT x Victaulic® Groove



◀ **3980** Fabricated SST, Style 80, Female NPT

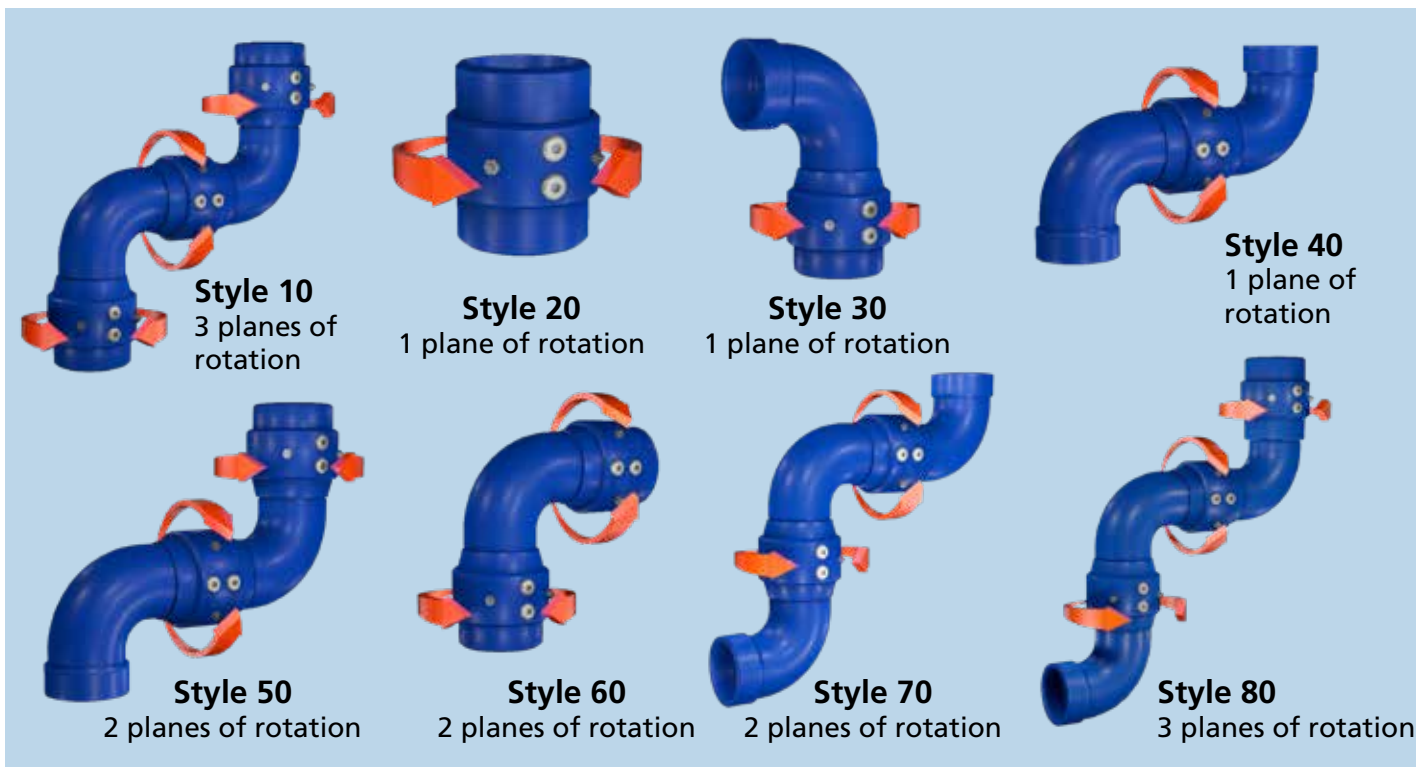


▶ **3950** Fabricated SST, Style 50, Female NPT



◀ **3330** Cast Bronze, Style 30, Female NPT





Ordering Chart: Call OPW Customer Service at 800-547-9393 for complete ordering information. Style 44 is drop tube swivel w/handle. Styles 35, 45, 55 have threaded boss. Styles 56, 58, 76, 78 have spring balance attachment lugs.

| Style (Planes of Rotation) | | Seal Materials | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 3 4 2 0 F - 0 4 0 3 | | 1 - Buna-N (Standard) 2 - Fluorocarbon 3 - PTFE 4 - EPDM 5 - Food Grade Nitrile Kalrez®, Chemraz® and other seal materials available. | |
| Construction | End Connections | Size | |
| Conventional Hose | F - 150 lb. ASME flange both ends | 007 - 3/4" | |
| Reel Swivels | FFT - 150 lb. ASME flange inlet x TTMA tank truck flange outlet | 010 - 1" | |
| | FJ - For submerged use, 150 lb. ASME flange both ends | 012 - 1-1/4" | |
| | FO - 150 lb. flange x female NPT threads | 015 - 1-1/2" | |
| | FSB - 150 lb. flange both ends, with spring balance attachment lugs | 020 - 2" | |
| | FT - TTMA tank truck flange both ends | 030 - 3" | |
| Conventional Swivels | FTH - TTMA tank truck flange both ends, with female | 040 - 4" | |
| | VO - Victaulic® x female NPT threads | 060 - 6" | |
| | FTO - TTMA tank truck flange inlet x female NPT threaded outlet | 080 - 8" | |
| | J - For submerged use | 100 - 10" | |
| | LFT - Long swivel joint with TTMA tank truck flanges | 120 - 12" | |
| | TFT - Female NPT threaded inlet x TTMA tank truck flange outlet | | |
| | VOG - Female NPT threads x Victaulic® groove, hard coat anodized aluminum | | |
| | W - Beveled for welding both ends | | |
| Endura™ DSF Split Flange Swivels* | NO SUFFIX LETTER (S) indicates Female NPT threads both ends. 300 lb. flanges available on some models. BSPT threads available. | | |
| * 2" - 4" Sizes Only. | | | |
| Alloy20®, Hastelloy®, Monel®, Duplex, PTFE-lined and other materials available. | | | |
| Availability of styles, sizes and materials may vary depending upon swivel configuration. Consult OPW Customer Service regarding your exact requirements. | | | |