



SWIVEL JOINTS

OPW Engineered Systems, part of the OPW Fluid Transfer Group, provides expert solutions for the safe handling, transfer, monitoring, measuring and protection of hazardous bulk products worldwide.



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 and 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 evaluation to determine 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 **F**EATURES

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 as required
- Teflon[®] seals are available as spring energized or silcone/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-lubricating 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)



Cast Stainless Steel, Aluminum, Ductile Iron, Bronze

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 flange/end 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, and 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".



Style 50

2 planes of rotation

Style 70

2 planes of rotation







Style 80 3 planes of rotation

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.



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.

Thread x Thread	Material	Model	Size (inches)	Dimensions
Style 20	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	Material	Model	Size (inches)	Dimensions
Style 20F	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	Materia	Model	Size (inches)	Dimensions
Style 20W	Steel, Fabricated	3420W	2, 3, 4, 6, 8, 10	
-	Stainless Steel, Fabricated	3920W	2, 3, 4, 6, 8, 10	

STYLE 30

Engineered Systems

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Thread x Thread	Material	Model	Size (inches)	Dimensions
Style 30	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	Material	Model	Size (inches)	Dimensions
Style 30F	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	Material	Model	Size (inches)	Dimensions
Flange for Submerged Use	Material Steel, Fabricated	Model 3430FJ	Size (inches) 2, 3, 4, 6, 8, 10	Dimensions
Flange for Submerged Use Style 30FJ	Material Steel, Fabricated Stainless Steel, Fabricated	Model 3430FJ 3930FJ	Size (inches) 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10	Dimensions
Flange for Submerged Use Style 30FJ	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum	Model 3430FJ 3930FJ 3630FJ	Size (inches) 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10 3, 4, 6	Dimensions
Flange for Submerged Use Style 30FJ Flange x Thread	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Material	Model 3430FJ 3930FJ 3630FJ Model	Size (inches) 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10 3, 4, 6 Size (inches)	Dimensions
Flange for Submerged Use Style 30FJ Flange x Thread Style 30FO	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Material Steel, Fabricated	Model 3430FJ 3930FJ 3630FJ Model 3430FO	Size (inches) 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10 3, 4, 6 Size (inches) 2, 3, 4	Dimensions
Flange for Submerged Use Style 30FJ Flange x Thread Style 30FO	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Material Steel, Fabricated Steel, Fabricated Steel, Fabricated	Model 3430FJ 3930FJ 3630FJ Model 3430F0 3930F0	Size (inches) 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10 3, 4, 6 Size (inches) 2, 3, 4 2, 3, 4	Dimensions Dimensions
Flange for Submerged Use Style 30FJ Flange x Thread Style 30FO	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Material Steel, Fabricated Steel, Fabricated Steel, Fabricated Aluminum	Model 3430FJ 3930FJ 3630FJ Model 3430F0 3930F0 3630F0	Size (inches) 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10 3, 4, 6 Size (inches) 2, 3, 4 2, 3, 4 3, 4	Dimensions Dimensions Dimensions
Flange for Submerged Use Style 30FJ Flange x Thread Style 30FO	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Material Steel, Fabricated Steel, Fabricated Stainless Steel, Fabricated Aluminum Ductile Iron	Model 3430FJ 3930FJ 3630FJ Model 3430F0 3930F0 3630F0 3630F0 3830F0	Size (inches) 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10 3, 4, 6 Size (inches) 2, 3, 4 2, 3, 4 3, 4 3, 4 3, 4	Dimensions Dimensions Dimensions
Flange for Submerged Use Style 30FJ Flange x Thread Style 30FO	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Material Steel, Fabricated Stainless Steel, Fabricated Stainless Steel, Fabricated Aluminum Ductile Iron Material	Model 3430FJ 3930FJ 3630FJ Model 3430F0 3930F0 3630F0 3830F0 Model	Size (inches) 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10 3, 4, 6 Size (inches) 2, 3, 4 2, 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4	Dimensions Dimensions Dimensions Dimensions Dimensions
Flange for Submerged Use Style 30FJ Flange x Thread Style 30FO Butt Weld x Butt Weld Style 30W	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Ductile Iron Material Steel, Fabricated	Model 3430FJ 3930FJ 3630FJ Model 3430F0 3930F0 3630F0 3830F0 3830F0 3830F0 3830F0	Size (inches) 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10 3, 4, 6 Size (inches) 2, 3, 4 2, 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4 3, 4	Dimensions Dimensions Dimensions Dimensions Dimensions
Flange for Submerged Use Style 30FJFlange x Thread Style 30FOButt Weld x Butt Weld Style 30W	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Ductile Iron Material Steel, Fabricated Steel, Fabricated Steel, Fabricated Steel, Fabricated Steel, Fabricated	Model 3430FJ 3930FJ 3630FJ Model 3430F0 3930F0 3630F0 3830F0 3830F0 3430W 3930W	Size (inches) 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10 3, 4, 6 Size (inches) 2, 3, 4 2, 3, 4 3, 4 3, 4 3, 4 3, 4 2, 3, 4 2, 3, 4 2, 3, 4 2, 3, 4 3, 4 3, 4 3, 4 2, 3, 4 2, 3, 4 3, 4 3, 4 3, 4 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10 2, 3, 4, 6, 8, 10	Dimensions Dimensions Dimensions Dimensions Dimensions



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

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Style 30W

Thread x Thread	Material	Model	Size (inches)	Dimensions
Style 34	Steel, Fabricated	3434	2, 3, 4	
	Stainless Steel, Fabricated	3934	2, 3, 4	
Flange x Flange	Material	Model	Size (inches)	Dimensions
Style 34F	Steel, Fabricated	3434F	2, 3, 4	
	Stainless Steel, Fabricated	3934F	2, 3, 4	

STYLE 35

STYLE 40

Material

Aluminum

Ductile Iron

Material

Aluminum

Ductile Iron

Material

Aluminum

Material

Aluminum

Ductile Iron

Steel, Fabricated

Steel, Fabricated

Steel, Fabricated

Stainless Steel, Fabricated

Stainless Steel, Fabricated

Stainless Steel, Fabricated

Bronze

Steel, Fabricated

Stainless Steel, Cast

Steel, Cast, High Pressure

Stainless Steel, Fabricated

Thread x Thread

Flange x Flange

Style 40F

Flanged for

Style 40FJ

Style 40F0

Submerged Use

Flange x Thread

Style 40

Thread x Thread	Material	Model	Size (inches)	Dimensions
Style 35	Steel, Fabricated	3435	2, 3, 4	
	Stainless Steel, Fabricated	3935	2, 3, 4	
	Aluminum	3635	3, 4	•
Flange x Flange	Material	Model	Size (inches)	Dimensions
Style 35F	Steel, Fabricated	3435F	2, 3, 4, 6	
	Stainless Steel, Fabricated	3935F	2, 3, 4, 6	
TTMA Truck Flanges	Material	Model	Size (inches)	Dimensions
Style 35F T	Aluminum	3635FT	4	•
	Aluminum	3635FTH*	4	•
	*Comes complete with	straight pip	e handle.	

Model

3240

3440

3740

3940

3640

3840

3340

Model

3440F

3940F

3640F

3840F

Model

3440FJ

3940FJ

3640FJ

Model

3440F0

3940FO

3640FO

3840F0

Size (inches)

1, 1-1/4, 1-1/2, 2

2, 3, 4

2, 3, 4

3/4, 1, 1-1/2

1, 1-1/2, 2, 3, 4

1, 1-1/2, 2, 3, 4

Size (inches)

Size (inches)

2, 3, 4, 6, 8, 10

2, 3, 4, 6, 8, 10

Size (inches)

2, 3, 4, 6

2, 3, 4

2, 3, 4

3, 4

3, 4

1, 1-1/2, 2, 3

2, 3, 4, 6, 8, 10

2, 3, 4, 6, 8, 10

3, 4, 6

3, 4

Dimensions

Dimensions

Dimensions

Dimensions



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

STYLES AVAILABLE

STYLE 40 (CONTINUED)

STYLE 45

Material

Aluminum

Material

Steel, Fabricated

Steel, Fabricated

Stainless Steel, Fabricated

Stainless Steel, Fabricated

Thread x Thread

Flange x Flange

Style 45

Style 45F

OV

TTMA Truck Flange	Material	Model	Size (inches)	Dimensions
Style 40FT	Aluminum	3640FT	3, 4	•
TTMA Truck Flange x Thread	Material	Model	Size (inches)	Dimensions
Style 40FTO	Aluminum	3640FT0	3, 4	•
Butt Weld x Butt Weld	Material	Model	Size (inches)	Dimensions
Style 40W	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	Material	Model	Size (inches)	Dimensions	
Style 44	Steel, Fabricated	3444	2, 3, 4		
	Stainless Steel, Fabricated	3944	2, 3, 4		
	Aluminum	3644	2, 3, 4	•	
Flange x Flange	Material	Model	Size (inches)	Dimensions	
Style 44F	Steel, Fabricated	3444F	2, 3, 4		
	Stainless Steel, Fabricated	3944F	2, 3, 4		
	Aluminum	3644F	3, 4, 6	•	
Flange x Thread	Material	Model	Size (inches)	Dimensions	
Flange x Thread Style 44FO	Material Steel, Fabricated	Model 3444F0	Size (inches) 2, 3, 4	Dimensions	
Flange x Thread Style 44F0	Material Steel, Fabricated Stainless Steel, Fabricated	Model 3444F0 3944F0	Size (inches) 2, 3, 4 2, 3, 4	Dimensions	
Flange x Thread Style 44FO	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum	Model 3444F0 3944F0 3644F0	Size (inches) 2, 3, 4 2, 3, 4 3, 4	Dimensions	
Flange x Thread Style 44F0 TTMA Truck Flange	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Material	Model 3444F0 3944F0 3644F0 Model	Size (inches) 2, 3, 4 2, 3, 4 3, 4 Size (inches)	Dimensions	
Flange x Thread Style 44FO TTMA Truck Flange Style 44FT	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Material Aluminum	Model 3444F0 3944F0 3644F0 3644F0 3644F0	Size (inches) 2, 3, 4 2, 3, 4 3, 4 Size (inches) 3, 4	Dimensions Dimensions Dimensions	
Flange x Thread Style 44FO TTMA Truck Flange Style 44FT TTMA Truck Flange x Thread	Material Steel, Fabricated Stainless Steel, Fabricated Aluminum Material Aluminum Material	Model 3444F0 3944F0 3644F0 Model 3644FT Model	Size (inches) 2, 3, 4 2, 3, 4 3, 4 Size (inches) 3, 4 Size (inches) 3, 4	Dimensions Dimensions Dimensions Dimensions	



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

Model

3445

3945

3645

3445F

3945F

Model

Size (inches)

Size (inches)

2, 3, 4

2, 3, 4

2, 3, 4, 6

2, 3, 4, 6

3, 4

Dimensions

•

Dimensions

Style 50Steel Cast, High Pressure32501, 1-1/2, 2Steel, Fabricated34502, 3, 4Stainless Steel, Cast37502, 3, 4Stainless Steel, Fabricated39502, 3, 4Aluminum36501-1/2, 2, 3, 4Ductile Iron38502, 3, 4Flange x FlangeMaterialModelSize (inches)Style 50FSteel, Fabricated3950F2, 3, 4, 6, 8, 10Style 50FSteel, Fabricated3950F2, 3, 4, 6, 8, 10Aluminum3650F3, 4•Ductile Iron3850F3, 4Ductile Iron3850F3, 4Ductile Iron3850F3, 4Ductile Iron3850F3, 4Ductile Iron3850F3, 4Ductile Iron3850F3, 4Ductile Iron3850F02, 3, 4Xiple 50F0Steel, Fabricated3950F0Style 50F0Steel, Fabricated3950F0Style 50F0AterialModelSteel, Fabricated3950F03, 4Ductile Iron3850F03, 4Butt Weld X Butt WeldMat	Thread x Thread	Material	Model	Size (inches)	Dimensions
Steel, Fabricated34502, 3, 4Stainless Steel, Cast37502, 3, 4Aluminum36501-1/2, 2, 3, 4Aluminum36501-1/2, 2, 3, 4Ductile Iron38502, 3, 4Flange x FlangeMaterialModelSize (inches)DimensionsStyle 50FSteel, Fabricated3450F2, 3, 4, 6, 8, 10Aluminum3650F2, 3, 4, 6, 8, 10Aluminum3650F2, 3, 4, 6, 8, 10Aluminum3650F3, 4Ductile Iron3850F3, 4Ductile Iron3850F3, 4Ductile Iron3850F3, 4Ductile Iron3850F3, 4Ductile Iron3850F3, 4Ductile Iron3850F02, 3, 4Style 50F0Steel, Fabricated3450F02, 3, 4Aluminum3650F03, 4Ductile Iron3850F03, 4Butt Weld X Butt WeldMaterialModelSize (in	Style 50	Steel Cast, High Pressure	3250	1, 1-1/2, 2	
Stainless Steel, Cast37502, 3, 4Stainless Steel, Fabricated39502, 3, 4Aluminum36501-1/2, 2, 3, 4Ductile Iron38502, 3, 4Flange x FlangeMaterialModelSize (inches)DimensionsStyle 50FSteel, Fabricated3450F2, 3, 4, 6, 8, 10Aluminum3650F2, 3, 4, 6, 8, 10Aluminum3650F3, 4, 6, 8, 10Aluminum3650F3, 4Ductile Iron3850F3, 4Flange x ThreadMaterialModelSize (inches)DimensionsStyle 50F0Steel, Fabricated3450F02, 3, 4Flange x ThreadMaterialModelSize (inches)DimensionsStyle 50F0Steel, Fabricated3450F02, 3, 4TTMA Truck Flange Style 50FTMaterialModelSize (inches)DimensionsStyle 50F1MaterialModelSize (inches)DimensionsStyle 50F1MaterialModelSize (inches)DimensionsStyle 50F1MaterialModelSize (inches)DimensionsStyle 50F1Steel, Fabricated3450W2, 3, 4, 6, 8, 10Butt Weld x Butt Weld Style 50WMaterialModelSize (inches)DimensionsSteel, Fabricated3450W2, 3, 4, 6, 8, 10Steel, Fabricated3450W2, 3, 4, 6, 8, 10Stainless Steel, Fabrica		Steel, Fabricated	3450	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 Material Model Size (inches) Dimensions Style 50F 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 Material Model Size (inches) Dimensions Style 50F0 Steel, Fabricated 3450F0 2, 3, 4 ● Style 50F0 Steel, Fabricated 3450F0 2, 3, 4 ● Style 50F0 Steel, Fabricated 3950F0 2, 3, 4 ● Ductile Iron 3850F0 3, 4 ● ● TIMA Truck Flange Material Model Size (inches) Dimensions Style 50FT Aluminum 3650FT 3, 4 ● ● Butt Weld x Butt Weld Material <td></td> <td>Stainless Steel, Cast</td> <td>3750</td> <td>2, 3, 4</td> <td></td>		Stainless Steel, Cast	3750	2, 3, 4	
Aluminum36501-1/2, 2, 3, 4Ductile Iron38502, 3, 4Flange x Flange Style 50FMaterialModelSize (inches)DimensionsStyle 50FSteel, Fabricated3450F2, 3, 4, 6, 8, 10Stainless Steel, Fabricated3950F2, 3, 4, 6, 8, 10Aluminum3650F3, 4Ductile Iron3850F3, 4Flange x Thread Style 50F0MaterialModelSize (inches)DimensionsStyle 50F0Steel, Fabricated3950F02, 3, 4Flange x Thread Style 50F0MaterialModelSize (inches)DimensionsStyle 50F0Steel, Fabricated3950F02, 3, 4TIMA Truck Flange Style 50FTMaterialModelSize (inches)DimensionsStyle 50F1MaterialModelSize (inches)DimensionsStyle 50F03, 4Ductile Iron3850F03, 4Ductile Iron3850F03, 4Ductile Iron3850F03, 4Ductile Iron3850F13, 4Butt Weld x Butt Weld Style 50WMaterialModelSize (inches)DimensionsSteel, Fabricated3450W2, 3, 4, 6, 8, 10Steel, Fabricated3450W2, 3, 4, 6, 8, 10Stainless Steel, Fabricated3950W2, 3, 4, 6, 8, 10		Stainless Steel, Fabricated	3950	2, 3, 4	
Ductile Iron38502, 3, 4Flange x Flange Style 50FMaterialModelSize (inches)DimensionsStyle 50FSteel, Fabricated3450F2, 3, 4, 6, 8, 10▲Stainless Steel, Fabricated3950F2, 3, 4, 6, 8, 10▲Aluminum3650F3, 4●Ductile Iron3850F3, 4●Flange x Thread Style 50F0MaterialModelSize (inches)DimensionsStyle 50F0MaterialModelSize (inches)DimensionsStyle 50F0Xeel, Fabricated3450F02, 3, 4▲MaterialModelSize (inches)DimensionsStyle 50F0Xeel, Fabricated3950F02, 3, 4▲TIMA Truck Flange Style 50FTMaterialModelSize (inches)DimensionsStyle 50FTMaterialModelSize (inches)DimensionsStyle 50FVSteel, Fabricated3950F03, 4●MaterialModelSize (inches)DimensionsStyle 50FTAluminum3650FT3, 4●Butt Weld x Butt Weld Style 50WMaterialModelSize (inches)DimensionsStyle 50WSteel, Fabricated3450W2, 3, 4, 6, 8, 10▲		Aluminum	3650	1-1/2, 2, 3, 4	•
Flange x Flange Style 50FMaterialModelSize (inches)DimensionsSteel, Fabricated3450F2, 3, 4, 6, 8, 10AStainless Steel, Fabricated3950F2, 3, 4, 6, 8, 10AAluminum3650F3, 4•Ductile Iron3850F3, 4•Flange x ThreadMaterialModelSize (inches)DimensionsStyle 50F0Steel, Fabricated3450F02, 3, 4•Flange x ThreadMaterialModelSize (inches)DimensionsStyle 50F0Steel, Fabricated3450F02, 3, 4•TTMA Truck Flange Style 50FTMaterialModelSize (inches)DimensionsTTMA Truck Flange Style 50FTMaterialModelSize (inches)DimensionsButt Weld x Butt Weld Style 50WMaterialModelSize (inches)DimensionsStyle 50WSteel, Fabricated3450W2, 3, 4, 6, 8, 10•		Ductile Iron	3850	2, 3, 4	•
Style 50FSteel, Fabricated3450F2, 3, 4, 6, 8, 10Stainless Steel, Fabricated3950F2, 3, 4, 6, 8, 10Aluminum3650F3, 4Ductile Iron3850F3, 4Flange x ThreadMaterialModelSize (inches)DimensionsStyle 50F0Steel, Fabricated3450F02, 3, 4Style 50F0Steel, Fabricated3450F02, 3, 4TIMA Truck FlangeMaterialModelSize (inches)DimensionsStyle 50F1MaterialModelSize (inches)DimensionsStyle 50F1MaterialModelSize (inches)DimensionsStyle 50WSteel, Fabricated3450F03, 4	Flange x Flange	Material	Model	Size (inches)	Dimensions
Stainless Steel, Fabricated3950F2, 3, 4, 6, 8, 10Aluminum3650F3, 4Ductile Iron3850F3, 4Flange x ThreadMaterialModelSize (inches)DimensionsStyle 50F0Steel, Fabricated3450F02, 3, 4▲Aluminum3650F02, 3, 4▲Ductile Iron3850F02, 3, 4▲Aluminum3650F03, 4▲Ductile Iron3850F03, 4▲TTMA Truck FlangeMaterialModelSize (inches)DimensionsStyle 50F1MaterialModelSize (inches)DimensionsButt Weld x Butt WeldMaterialModelSize (inches)DimensionsStyle 50WSteel, Fabricated3450W2, 3, 4, 6, 8, 10▲	Style 50F	Steel, Fabricated	3450F	2, 3, 4, 6, 8, 10	
Aluminum3650F3, 4Ductile Iron3850F3, 4Flange x ThreadMaterialModelSize (inches)DimensionsStyle 50F0Steel, Fabricated3450F02, 3, 4AStainless Steel, Fabricated3950F02, 3, 4AAluminum3650F03, 4•Ductile Iron3850F03, 4•TTMA Truck FlangeMaterialModelSize (inches)DimensionsStyle 50FTMaterialModelSize (inches)DimensionsStyle 50FTAluminum3650FT3, 4•Butt Weld x Butt WeldMaterialModelSize (inches)DimensionsStyle 50WSteel, Fabricated3450W2, 3, 4, 6, 8, 10▲		Stainless Steel, Fabricated	3950F	2, 3, 4, 6, 8, 10	
Ductile Iron3850F3, 4Flange x Thread Style 50F0MaterialModelSize (inches)DimensionsSteel, Fabricated3450F02, 3, 4AStainless Steel, Fabricated3950F02, 3, 4AAluminum3650F03, 4•Ductile Iron3850F03, 4•TTMA Truck Flange Style 50FTMaterialModelSize (inches)DimensionsStyle 50FTMaterialModelSize (inches)DimensionsButt Weld x Butt Weld Style 50WMaterialModelSize (inches)DimensionsStyle 50WSteel, Fabricated3450W2, 3, 4, 6, 8, 10A		Aluminum	3650F	3, 4	•
Flange x Thread Style 50F0MaterialModelSize (inches)DimensionsSteel, Fabricated3450F02, 3, 4AStainless Steel, Fabricated3950F02, 3, 4AAluminum3650F03, 4ODuctile Iron3850F03, 4OTTMA Truck Flange Style 50FTMaterialModelSize (inches)DimensionsAluminum3650FT3, 4OButt Weld x Butt Weld Style 50WMaterialModelSize (inches)DimensionsStyle 50WSteel, Fabricated3450W2, 3, 4, 6, 8, 10A		Ductile Iron	3850F	3, 4	•
Style 50F0 Steel, Fabricated 3450F0 2, 3, 4 ▲ Stainless Steel, Fabricated 3950F0 2, 3, 4 ▲ Aluminum 3650F0 3, 4 ● Ductile Iron 3850F0 3, 4 ● TTMA Truck Flange Material Model Size (inches) Dimensions Style 50FT Aluminum 3650FT 3, 4 ● Butt Weld x Butt Weld Material Model Size (inches) Dimensions Style 50W Steel, Fabricated 3450W 2, 3, 4, 6, 8, 10 ▲	Flange x Thread	Material	Model	Size (inches)	Dimensions
Stainless Steel, Fabricated 3950F0 2, 3, 4 Aluminum 3650F0 3, 4 Ductile Iron 3850F0 3, 4 TTMA Truck Flange Material Model Size (inches) Dimensions Style 50FT Aluminum 3650FT 3, 4 • Butt Weld x Butt Weld Material Model Size (inches) Dimensions Style 50W Steel, Fabricated 3450W 2, 3, 4, 6, 8, 10 ▲	Style 50F0	Steel, Fabricated	3450FO	2, 3, 4	
Aluminum 3650F0 3, 4 • Ductile Iron 3850F0 3, 4 • TTMA Truck Flange Material Model Size (inches) Dimensions Style 50FT Aluminum 3650FT 3, 4 • Butt Weld x Butt Weld Material Model Size (inches) Dimensions Style 50W Steel, Fabricated 3450W 2, 3, 4, 6, 8, 10 ▲		Stainless Steel, Fabricated	3950FO	2, 3, 4	
Ductile Iron3850F03, 4TTMA Truck Flange Style 50FTMaterialModelSize (inches)DimensionsAluminum3650FT3, 4•Butt Weld x Butt Weld Style 50WMaterialModelSize (inches)DimensionsStyle 50WSteel, Fabricated3450W2, 3, 4, 6, 8, 10▲		Aluminum	3650FO	3, 4	•
TTMA Truck Flange Style 50FTMaterialModelSize (inches)DimensionsAluminum3650FT3,4•Butt Weld x Butt Weld Style 50WMaterialModelSize (inches)DimensionsSteel, Fabricated3450W2, 3, 4, 6, 8, 10•Stainless Steel, Fabricated3950W2, 3, 4, 6, 8, 10•		Ductile Iron	3850FO	3, 4	•
Style 50FT Aluminum 3650FT 3, 4 Butt Weld x Butt Weld Material Model Size (inches) Dimensions Style 50W Steel, Fabricated 3450W 2, 3, 4, 6, 8, 10 A	TTMA Truck Flange	Material	Model	Size (inches)	Dimensions
Butt Weld x Butt Weld Material Model Size (inches) Dimensions Style 50W Steel, Fabricated 3450W 2, 3, 4, 6, 8, 10 A Stainless Steel, Fabricated 3950W 2, 3, 4, 6, 8, 10 A	Style 50FT	Aluminum	3650FT	3, 4	•
Style 50W Steel, Fabricated 3450W 2, 3, 4, 6, 8, 10 A Stainless Steel, Fabricated 3950W 2, 3, 4, 6, 8, 10 A	Butt Weld x Butt Weld	Material	Model	Size (inches)	Dimensions
Stainless Steel, Fabricated 3950W 2, 3, 4, 6, 8, 10	Style 50W	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	Material	Model	Size (inches)	Dimensions
Style 55	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	Material	Model	Size (inches)	Dimensions
Style 55F	Steel, Fabricated	3455F	2, 3, 4, 6	
	Stainless Steel, Fabricated	3955F	2, 3, 4, 6	
Flange x TTMA Truck Flange	Material	Model	Size (inches)	Dimensions
Style 55FFT	Steel, Fabricated	3455FFT	3, 4	
	Ductile Iron	3855FFT	3	•
Flange x Thread	Material	Model	Size (inches)	Dimensions
Style 55FO	Steel, Fabricated	3455FO	2, 3, 4	
	Stainless Steel, Fabricated	3955FO	2, 3, 4	
	Aluminum	3655FO	3, 4	•
	Ductile Iron	3855FO	3	•
TTMA Truck Flange	Material	Model	Size (inches)	Dimensions
Style 55FT	Aluminum	3655FT	4	•
Thread x TTMA Truck Flange	Material	Model	Size (inches)	Dimensions
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Dimensions Chart on page 20: A Steel & Stainless Steel
Aluminum, Ductile Iron & Bronze

Thread x Thread	Material	Model	Size (inches)	Dimensions
Style 60	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	Material	Model	Size (inches)	Dimensions
Style 60F	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	Material	Model	Size (inches)	Dimensions
Style 60F0	Steel, Fabricated	3460F0	2, 3, 4	
· ·	Stainless Steel, Fabricated	3960F0	2, 3, 4	
	Aluminum	3660F0	3, 4	•
	Ductile Iron	3860F0	3, 4	•
Thread x Thread, with	Material	Model	Size (inches)	Dimensions
Drilled Boss	Ductile Iron	3860T	2	•
Style 60T	Bronze	3360T	1-1/2, 2	•
Butt Weld x Butt Weld	Material	Model	Size (inches)	Dimensions
Style 60W	Steel, Fabricated	3460W	2, 3, 4, 6, 8, 10	



Style 70W

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

Engineered Systems 信德迈科技(北京)有限公司Phone:010-8428 2935,139 1096 2635 Fax:010-8428 8762 北京朝阳区望京SOHO-T1-C座2115室 www.cnmec.biz Email:sales@cnmec.biz ^{© Co}l

STYLE 70

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Inread X Inread	Material	Model	Size (inches)	Dimensions
Style 70	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	Material	Model	Size (inches)	Dimensions
Style 70F	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	Material	Model	Size (inches)	Dimensions
Style 70F0	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	Material	Model	Size (inches)	Dimensions
Style 70FT	Aluminum	3670FT	3, 4	•
TTMA Truck Flange x Thread	Material	Model	Size (inches)	Dimensions
Style 70FT0	Aluminum	3670FT0	3	•
Butt Weld x Butt Weld	Material	Model	Size (inches)	Dimensions
Style 70W	Steel, Fabricated	3470W	2, 3, 4, 6, 8, 10	
	Stainless Steel, Fabricated	3970W	2, 3, 4, 6, 8, 10	

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STYLE 80^{*}

Thread x Thread	Material	Model	Size (inches)	hes) Dimensions	
Style 80	Steel, Fabricated	3480	2, 3, 4		
	Stainless Steel, Fabricated	3980	2, 3, 4		
Flange x Flange	Material	Model	Size (inches)	Dimensions	
Style 80F	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^{*}

Material	Model	Size (inches)	Dimensions
Steel, Fabricated	3410	2, 3, 4	
Stainless Steel, Fabricated	3910	2, 3, 4	
Material	Model	Size (inches)	Dimensions
Steel, Fabricated	3410F	2, 3, 4, 6, 8, 10	
Stainless Steel, Fabricated	3910F	2, 3, 4, 6, 8, 10	
	Material Steel, Fabricated Stainless Steel, Fabricated Material Steel, Fabricated Stainless Steel, Fabricated	MaterialModelSteel, Fabricated3410Stainless Steel, Fabricated3910MaterialModelSteel, Fabricated3410FStainless Steel, Fabricated3910F	MaterialModelSize (inches)Steel, Fabricated34102, 3, 4Stainless Steel, Fabricated39102, 3, 4MaterialModelSize (inches)Steel, Fabricated3410F2, 3, 4, 6, 8, 10Stainless Steel, Fabricated3910F2, 3, 4, 6, 8, 10

*Flange x thread (Style 10FO) and butt weld x butt weld (Style 10W) units are also available.



Style 80



Swivel joints are an integral part of OPW's complete line of loading arm assemblies. This arm replaced hose in a railcar unloading operation.

Dimensions Chart on page 20: A 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 are available (Styles 56, 58, 76, and 78) 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.



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	Material	Model	Size (inches)	Dimensions
Style 56 (DFRH, UFLH)	Steel, Fabricated	3456	2, 3, 4	
	Stainless Steel, Fabricated	3956	2, 3, 4	
	Ductile Iron	3856	3, 4	•
Flange x Flange	Material	Model	Size (inches)	Dimensions
Style 56F (DFRH*)	Steel, Fabricated	3456F	2, 3, 4, 6	
	Stainless Steel, Fabricated	3956F	2, 3, 4, 6	
Flange x TTMA Flange	Material	Model	Size (inches)	Dimensions
Style 56FFT (DFRH*)	Steel, Fabricated	3456FFT	3, 4	
· · · · ·	Stainless Steel, Fabricated	3956FFT	3, 4	
Flange x Thread	Material	Model	Size (inches)	Dimensions
Style 56FO (DFRH, UFLH)	Steel, Fabricated	3456F0	2, 3, 4	
	Stainless Steel, Fabricated	3956FO	2, 3, 4	
	Ductile Iron	3856FO	2, 3, 4	•
Thread x TTMA Flange	Material	Model	Size (inches)	Dimensions
Style 56TFT (DFRH*)	Steel, Fabricated	3456TFT	3, 4	
	Stainless Steel, Fabricated	3956TFT	3, 4	



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



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

Dimensions Chart on page 20: A Steel & Stainless Steel • Aluminum, Ductile Iron & Bronze

Thread x Thread	Material	Model	Size (inches)	Dimensions
Style 58 (DFRH, UFLH)	Steel, Fabricated	3458	2, 3, 4	
	Stainless Steel, Fabricated	3958	2, 3, 4	
	Ductile Iron	3858	2, 3, 4	•
Flange x Flange	Material	Model	Size (inches)	Dimensions
Style 58F (DFRH*)	Steel, Fabricated	3458F	2, 3, 4, 6, 8, 10	
• · · ·	Stainless Steel, Fabricated	3958F	2, 3, 4, 6, 8, 10	
Flange x TTMA Flange	Material	Model	Size (inches)	Dimensions
Style 58FFT (DFRH*)	Steel, Fabricated	3458FFT	3, 4	
	Stainless Steel, Fabricated	3958FFT	3, 4	
Flange x Thread	Material	Model	Size (inches)	Dimensions
Style 58FO (DFRH, UFLH)	Steel, Fabricated	3458F0	2, 3, 4	
	Stainless Steel, Fabricated	3958F0	2, 3, 4	
	Ductile Iron	3858FO	3, 4	•
Thread x TTMA Flange	Material	Model	Size (inches)	Dimensions
Style 58TFT (DFRH*)	Steel, Fabricated	3458TFT	3, 4	
•	Stainless Steel, Fabricated	3958TFT	3, 4	



Style 78FFT

Style 78F0

STYLE 76

Flange x Flange	Material	Model	Size (inches)	Dimensions
Style 76F (DFRH*)	Steel, Fabricated	3476F	3, 4, 6	
	Stainless Steel, Fabricated	3976F	3, 4, 6	
Flange x TTMA Flange	Material	Model	Size (inches)	Dimensions
Style 76FFT (DFRH*)	Steel, Fabricated	3476FFT	3, 4	
· · · · ·	Stainless Steel, Fabricated	3976FFT	3, 4	
Flange x Thread	Material	Model	Size (inches)	Dimensions
Style 76FO (DFRH, UFLH)	Steel, Fabricated	3476F0	2, 3, 4	
	Stainless Steel, Fabricated	3976FO	2, 3, 4	
	Ductile Iron	3876FO	3, 4	•

STYLE 78

			PHILOHOIONO
Steel, Fabricated	3478F	2, 3, 4, 6	
Stainless Steel, Fabricated	3978F	2, 3, 4, 6	
Material	Model	Size (inches)	Dimensions
Steel, Fabricated	3478FFT	3, 4	
Stainless Steel, Fabricated	3978FFT	3, 4	
Material	Model	Size (inches)	Dimensions
Steel, Fabricated	3478F0	2, 3, 4	
Stainless Steel, Fabricated	3978FO	2, 3, 4	
Ductile Iron	3878FO	3, 4	•
	Stainless Steel, Fabricated Material Steel, Fabricated Stainless Steel, Fabricated Material Steel, Fabricated Stainless Steel, Fabricated Ductile Iron	Stainless Steel, Fabricated3978FMaterialModelSteel, Fabricated3478FFTStainless Steel, Fabricated3978FFTMaterialModelSteel, Fabricated3478FOSteel, Fabricated3478FOStainless Steel, Fabricated3978FODuctile Iron3878FO	Stainless Steel, Fabricated3978F2, 3, 4, 6MaterialModelSize (inches)Steel, Fabricated3478FFT3, 4Stainless Steel, Fabricated3978FFT3, 4MaterialModelSize (inches)Steel, Fabricated3478FO2, 3, 4Steel, Fabricated3478FO2, 3, 4Steel, Fabricated3478FO2, 3, 4Ductile Iron3878FO3, 4

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

Dimensions Chart on page 20: 🛦 Steel & Stainless Steel 🗧 Aluminum, Ductile Iron & Bronze

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	Material	Model	Size	Dimensions	
Style 20V0	Aluminum	2620-VO	1-1/2" x 2"	Use 1-1/2"	•
	Cast Iron	2820-V0	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	Material	Model	Size	Dimensions	
Style 30VO	Aluminum	2630-VO	1-1/2" x 2"	Use 1-1/2"	•
	Cast Iron	2830-VO	1-1/2" x 2", 2" x 2"	Use1-1/2", 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	Material	Model	Size	Dimensions	
Style 3637VO	Aluminum	3637V0	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.

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: A 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 means there are no individual balls to deal with. 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 can also serve as a purge port, permitting use of an inert blanket of 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







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	3001-K	
Viton®	3002-K	
Teflon [®]	3003-K	
EPT	3004-K	
Neoprene	3005-K	
		1

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 • Specially formulated to reduce friction and wear • Requires on y annual lubrication	 s) cartridge • Will not drip, melt or carbonize • Complies with FDA regulation 21CFR178.3570 • Transportance 4005 - 75055 (4000 - 200 000)
885-0085	High Performance Synthetic Lubricant for EPT Seals	• Temperature range -40°F - 750°F (-40°C - 398.8°C)
∧ Warning:	EPT/EPDM Seals require the use of a OPW 885-008	5 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	Part No.	Part No.
	Pair of Races	Steel Balls	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

		Flang	e O.D.	Bolt	Circle	No. Bolt	Bolt	t Dia.
Туре	Size (inches)	in,	(mm)	in,	(mm)	Holes	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., other types of flanges 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	Α	В	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°	10-1/4ª	12-3/4°	10-3/4°	5-1/16	5-13/16	3	8-1/8ª	10-1/2°	11-3/4ª	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 ^⁵		12-9/16	9		18-15/16°	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	Α	В	D1	D2	F	G1	G2	H1	H2	L
1	2-7/16	1-3/4	4-5/16 ^f		4-5/16	2-1/2		4-15/16 ^f		
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	7-5/8º	4-5/8	5	6-7/8	6-7/8	1-1/2
4	6-1/16	5°	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	Α	В	D1	D2	D3	F	G1	G2	G 3	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°	261°	324°	273°	129	148	77		267°	299°	51
4"	159	135	162	273	324	324	161	180	102	207°	299	324	51
6"	229			342	367	621 ⁵		319	229	240	481°	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	Α	В	D1	D2	F	G1	G2	H1	H2	L	
1"	62	45	110 ^f		110	64		126 ^r			
1-1/2"	75	60	118		121	77		119			
2"	96	75	145		156	80	140	143		32	
3"	124	102°	169	169	194º	118	127	175	175	38	
4"	154	127°	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.

Flanged Ends (inches)

APPROXIMATE WEIGHTS (Except EnduraTM Series)

Threaded Ends (inches)

Style	3/	4 & 1-1/2	1-1/4 & 1-1/2	2	3	4	Style		2	3	4	6	8	10
20	lbs.	3 lbs.	4	8	15	22	20E	lbs.	20lbs.	37	49	95	210	265
20	kgs	1	2	4	7	10	201	kgs	9 kg	17	22	43	95	120
20	lbs.	4 lbs.	5	9	18	24	30F	lbs.	21 lbs.	40	56	112	245	315
30	kgs	2 kg	2	4	8	11	001	kgs	10 kg	18	25	51	111	143
40	lbs.	5 lbs.	6	11	23	34	40F	lbs.	23 lbs.	43	62	128	275	380
40	kgs	2 kg	3	5	10	15		kgs	10 kg	20	28	58	125	172
50	lbs.	8 lbs.	9	16	35	48	50F	lbs.	28 lbs.	56	78	169	415	525
00	kgs	4 kg	4	7	16	22	001	kgs	13 kg	25	35	11	188	238
CO	lbs.	7 lbs.	8	14	30	38	60F	lbs.	26 lbs.	53	70	153	365	435
00	kgs	3 kg	4	6	14	17	001	kgs	12 kg	24	32	69	166	197
70	lbs.	9 lbs.	10	18	40	58	70F	lbs.	30 lbs.	60	85	186	465	615
/0	kgs	4 kg	5	8	18	26	701	kgs	14 kg	27	39	84	211	279
	lbs.	, , , , , , , , , , , , , , , , , , ,		22	50	70	80F	lbs.	35 lbs.	72	100	225	580	735
80	kas			10	23	32		kgs	16 kg	33	45	102	263	33
	lbs.			20	47	64	10E	lbs.	34 lbs.	70	95	203	530	645
10	kgs			9	22	29		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 assure 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 150lb. 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.



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.



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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.



Availability of styles, sizes and materials may vary depending upon swivel configuration. Consult OPW Customer Service regarding your exact requirements.



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CHEMICALS	Chlorine Acids & Bases Amines Anhydrous Ammonia Propylene Butadiene Hazardous Liquids	Bellow Sealed Valves Sample Valves Lined Ball Valves Indu Butterfly Valves Industrial Valves IsO Rings Sight Flow Indicators Globe Valves Swivels Dry Disconnects Quick Disconnects Epsilon	 Loading Arms Autoloks Kamvaloks Dryloks Loading Manholes Valves Actuators Swivels Epsilon 	Cargo Tanks • Manholes • Vapor Vents • Electronics • Internal Valves • Sealed Parcel • Epsilon	Rail Tank Cars • Safety Valves • Plug Valves • Ball Valves • Level Measurement • Autoloks • Kamvaloks • Dryloks • Rupture Disc Devices • Angle Valves • Epsilon	 Loading Arms Autoloks Kamvaloks Dryloks Valves Actuators Safety Breakaways Swivels Swivels Epsilon
DRY BULK	• Cement • Flour/Starch • Pharmaceuticals	Industrial Valves Sight Flow Indicators Butterfly Valves Swivels	Loading Arms Aerators Hatch Covers Swivels	Cargo Tanks • Manholes • Check Valves • Hopper Tees • Butterfly Valves • Aerators • Weld Rings	Railcars • Manholes • Hatches • Access Ports • Check Valves • Hopper Tees • Butterfly Valves • Aerators • Pressure Vacuum Valves	Aerators Butterfly Valves Tank Hatches Pressure Relief Vacuum Relief Temperature Monitoring
INDUSTRIAL/GENERAL	 Food Processing Pharmaceuticals Waste Water High-Purity Liquids Breweries Pulp and Paper Steel Processing 	Lined Ball Valves Lined Butterfly Valves Sample Systems Sight Flow Indicators ISO Rings Dry Disconnects Swivels Quick Disconnects High-Performance Butterfly Valves Forsilon	Loading Arms Couplers Rack Monitors Swivels Dry Disconnects Quick Disconnects Butterfly Valves Epsilon	Cargo Tanks Manholes Vapor Vents Electronics Weld Rings Hopper Tees Pneumatic Controls Sealed Parcel Dry Disconnets Epsilon	Rail Tank Cars • Safety Valves • Plug Valves • Ball Valves • Level Measurement • Autoloks • Kamvaloks • Dryloks • Rupture Disc Devices • Angle Valves • Epsilon	Loading Arms Couplers Rack Monitors Swivels Dry Disconnects Quick Disconnects Butterfly Valves Epsilon



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