

# ZSi Engineering Catalog

Manufacturers of Cushioned Clamping, Support Systems, and Quick Disconnects



**No. 10**

[www.zsi-inc.com](http://www.zsi-inc.com)

## Cushioned Clamping Systems (Overview - pages 4-5) (For Vibration Resistance, Shock Absorption, Isolation of Dissimilar Metals)

<p>Cush-A-Nator® (6-7)</p>	<p>Cush-A-Clamp® (8)</p>	<p>Cush-A-Claw (9)</p> <p>Surface Mount Strut Mount</p>	<p>Cush-A-Grip™ (10)</p>	<p>Cush-A-Clip (10)</p>
<p>Cush-A-Strip™ (11)</p>	<p>Omega Series™ (12)</p> <p>Flame Retardant Flame Retardant Halogen Free</p>	<p>Alpha Series™ (13)</p> <p>Flame Retardant Flame Retardant Halogen Free</p>	<p>Porce-A-Clamp™ (14)</p> <p>Flame Retardant Flame Retardant Halogen Free</p>	

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## Z-Strut Channels (For Strut Mounted Clamping Systems)

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## Beta Clamp Products

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## Z-Clamp Products (Overview - page 50)

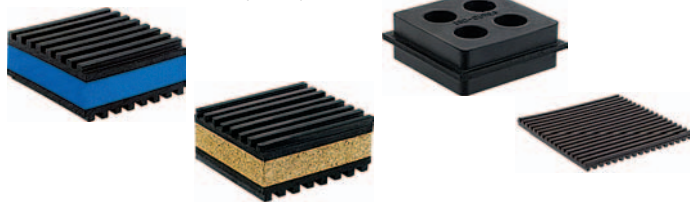
(For In line Clamping of High Pressure Hydraulic Pipe, Tube, or Hose)

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## CUSHIONED CLAMPING

ZSi offers a comprehensive line of cushioning clamps – from the original Cush-A-Clamp® to the newer Cush-A-Nator®. There is a ZSi solution to cushion shock, vibration, noise and temperature.

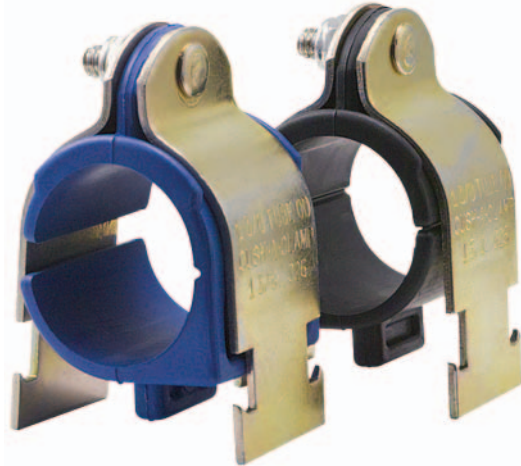
### CUSH-A-NATOR® (See Pages 6-7)

The Cush-A-Nator® is the newest breakthrough in cushioned clamping. It offers the user with an option for the highest temperature range of any cushion clamp on the market -65°F to 340°F (-53°C to 170°C), or just the advanced features of the superior new design.

The new Cush-A-Nator® features a "thumb drive" tab that simplifies installation.

It is also a perfect solution for retrofit since the clamp can be installed on a pipe that is already resting on the channel support.

*And, it's designed and manufactured in Michigan.*

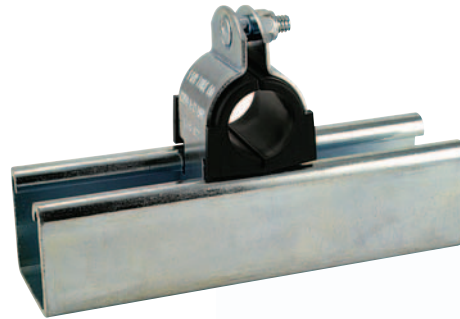


### CUSH-A-CLAMP® (See Page 8)

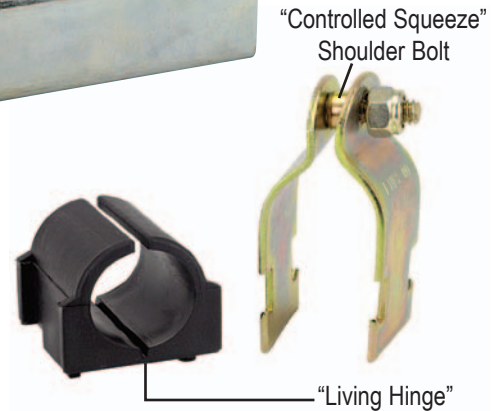
**CUSH-A-CLAMP®** – channel mounted clamping systems is ideal for multiple line runs. It absorbs shock and vibration, reducing unwanted noise and it prevents galvanic corrosion.

**THE CLAMP** — Features a unique shoulder stud which is securely fastened to one clamp half. This **Controlled Squeeze™** design eliminates over-tightening and rotation while a nylon-insert nut assures a positive lock. Clamps are available in steel (with electro-dichromate finish), and stainless steel. **THE CUSHION** — Manufactured from a thermoplastic elastomer, it's built tough to withstand the effects of most oils, chemicals and industrial cleaning compounds, in temperatures from -50°F to 275°F. A patented "Living Hinge" allows the cushion to be spread apart for quick, easy installation. Interlock edges and channel locator legs ensure that the cushion remains in place.

**INSTALLATION** — One man, one tool time savings. Retrofits can be added without disassembling your present system.



Fits any standard 1 5/8" wide channel.



"Controlled Squeeze" Shoulder Bolt

"Living Hinge"



### OMEGA SERIES™ (See Page 12)



**OMEGA SERIES™** – The Omega Series™ clamp assembly retains, guides, protects and uniformly spaces line runs. Attached with two standard fasteners to any flat surface, the Omega Series™ clamp eliminates the use of special channels, providing a savings in both space and cost. They go up fast, lines are rigid and look neat.

**THE CLAMP** — Available in steel (with electro-dichromate finish), and stainless steel.

**THE CUSHION** — Manufactured from a thermoplastic elastomer, it's built tough to withstand the effects of most oils, chemicals and industrial cleaning compounds, in temperatures from -50°F to 275°F. Interlock edge ensures that the cushion remains in place.

## CUSH-A-CLAW

(See Page 9)



**Cush-A-Claw** Grabs on to your Tube, Pipe, or Hose and holds it in place. The unique one piece patent pending design allows for quick, simple, and easy installation. It will not rust because it's molded from the same choice TPE Material of some of our other products that you've come to know and trust.

Available for surface mount, or strut mount.

## CUSH-A-CLIP

(See Page 10)



**Cush-A-Clip** is a simple, economical lightweight hanger for supporting tubing. The secure but non-tightening design allows for expansion, greatly reducing joint fractures

## CUSH-A-GRIP

(See Page 10)



**Cush-A-Grip** non-metallic strut clamps allow quick and easy corrosion resistant attachment of pipe, tube, and hose to Z-Strut support channels. They offer a cost effective alternative to metallic clamps.



## CUSH-A-STRIP™

(See Page 11)

**CUSH-A-STRIP™** is manufactured from a thermoplastic elastomer, Cush-A-Strip™ is designed for use from -50°F to 275°F.

Cush-A-Strip™ is designed for use with standard steel clamps ranging from 1/4" tube to 6" pipe and is packaged in 20 Ft. rolls in an E-Z dispenser box.

The special locking lip edges ensure that Cush-A-Strip™ will remain in place with a balanced grip.

## ALPHA SERIES™

(See Page 13)



**ALPHA SERIES™** – Designed for the tough jobs, the Alpha Series™ U-Bolt Assembly secures pipe runs to any flat surface. The cushion design provides total load distribution, allowing the U-Bolt to become a full contact hanger, eliminating knife-edge loading.

The U-Bolt traps and secures the cushion in place to prevent lateral movement, while nylon insert locknuts provide a positive lock. Available in electro-galvanized steel or 316 stainless steel.

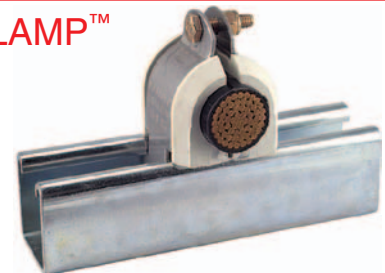
The Cushion is a thermoplastic elastomer.

**Porce-A-Clamp™** Replaces Porcelain and Maple Cable Clamp. Assembly consists of thermoplastic elastomer cushion with plated or stainless steel clamp. Plated steel and stainless are both supplied with Silicon Bronze bolt and nut used to breakup the magnetic field around the cable at the clamping location.

Porce-A-Clamp™ offers a convenient alternative to troublesome porcelain since it is made from non-breakable material.

## PORCE-A-CLAMP™

(See Page 14)



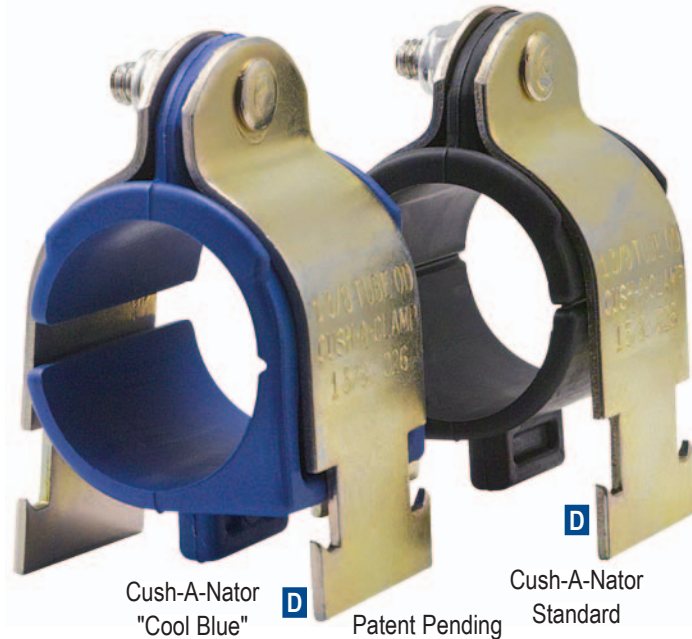
## FLAME RETARDANT PRODUCTS

ZSi offers flame retardant options for many of the clamping products. They are available in two different types of cushion. The Flame Retardant/High Hardness cushion is designed for applications such as wire and cable insulation, electrical connectors, seals, gaskets and boots. The Halogen-Free/Flame Retardant cushions contain an optimal combination of rubbers and thermoplastics reactively combined with non halogenated flame retardant additives.

Flame retardant options are indicated by the logos shown below.

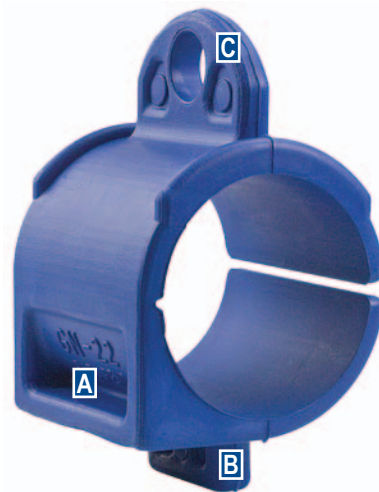


## A NEW BREAKTHROUGH IN CUSHIONED CLAMPING DEVELOPED BY INDUSTRY LEADER ZSI



The Cush-A-Nator® is designed to provide the user with a choice of the highest heat range resistance of any cushion on the market or simply the advanced features of a superior design.

*The Cush-A-Nator® is designed and manufactured in Michigan.*



The Cush-A-Nator cushion is manufactured in the United States and made from a new incredibly durable thermoplastic rubber that resists high heat and provides longer life against vibration fatigue. The Cush-A-Nator is made from a proprietary thermoplastic vulcanized material cross-linked with high performance rubber and thermoplastic elastomers, which produces the highest operating temperature range in the industry.

Cush-A-Nator® "Cool Blue" has service temperatures of -65°F to 340°F (-53°C to 170°C).

### Features

#### **A** Thumb Drive

The Cush-A-Nator® has the exclusive "Thumb Drive" that provides the installer a gripping point to easily open the cushion with the help of leverage tabs and a living hinge. Easy and effortlessly to install.

#### **B** Self-Alignment

Cushion can be opened and placed over the pipe or tube and rotated into place while on the channel and automatically aligned with the channel opening ready for clamping. No more pre-installing cushions or awkward installation. Cushion replacement has been made simple and easy.

#### **C** Pressure Control

The Cush-A-Nator® cushion has a built in squeeze control as part of the cushion design. The side opening and the squeeze control tab provides evenly distributed pressure around the tube or pipe.

#### **D** Complete Clamping Unit

The Cush-A-Nator® is the only strut mounted cushion that is mechanically connected to the supporting steel clamp because the bolt passes through the squeeze control tab forming the single unit connection. This design helps prevent the cushion from excess vibration by being attached directly to the clamp.



Cush-A-Nator® standard is made from our reliable thermoplastic elastomer that has an operating range of -50°F to 275°F (-45°C to 135°C), but provides the features of the new design.

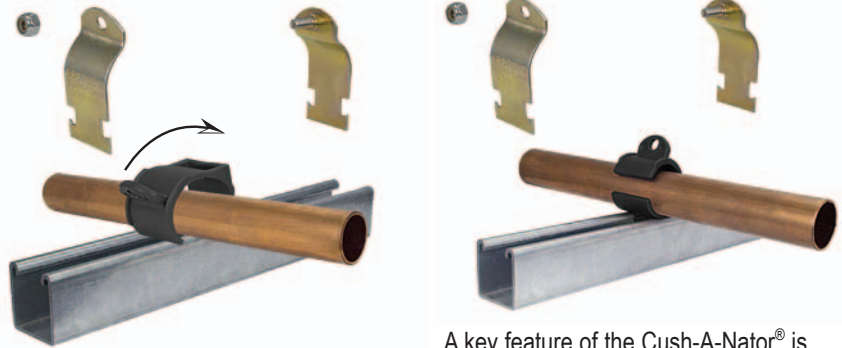
# CUSH-A-NATOR® UNIQUE INSTALLATION

Patent Pending

**Step 1:**

**Step 2:**

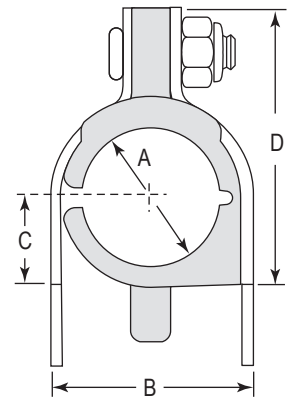
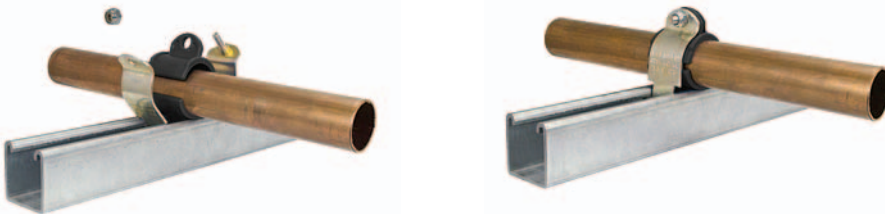
Insert the Cush-A-Nator onto the pipe and then use the exclusive "Thumb Drive" to rotate into position.



A key feature of the Cush-A-Nator® is this ability to place the cushion and rotate into position. Perfect for retrofit applications!

**Step 3:**

Add Pipe Clamps and tighten the assembly.


**Cush-A-Nator® Standard**

Part No.			O.D. Tube Size	Dimensions (inches)			
Steel	SS304	SS316		A	B	C	D
CN04	CN04SS	CN04S6	1/4"	0.25	0.62	0.27	0.98
CN06	CN06SS	CN06S6	3/8"	0.37	0.82	0.33	1.13
CN08	CN08SS	CN08S6	1/2"	0.50	0.94	0.40	1.34
CN10	CN10SS	CN10S6	5/8"	0.62	1.06	0.46	1.54
CN14	CN14SS	CN14S6	7/8"	0.87	1.31	0.58	1.82
CN18	CN18SS	CN18S6	1 1/8"	1.12	1.57	0.70	2.08
CN22	CN22SS	CN22S6	1 3/8"	1.37	1.82	0.83	2.34
CN26	CN26SS	CN26S6	1 5/8"	1.62	2.07	0.96	2.60
CN34	CN34SS	CN34S6	2 1/8"	2.12	2.57	1.27	3.23

Contact Factory for Additional Sizes

**Cush-A-Nator® "Cool Blue"**  
 [extended temperature -65°F to 340°F]

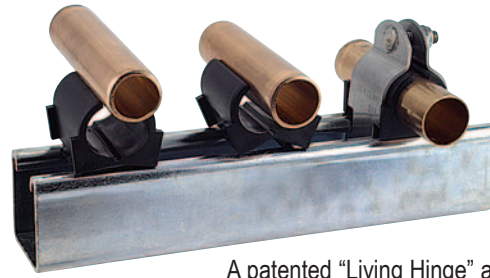
Part No.			O.D. Tube Size	Dimensions (inches)			
Steel	SS304	SS316		A	B	C	D
HT04	HT04SS	HT04S6	1/4"	0.25	0.62	0.27	0.98
HT06	HT06SS	HT06S6	3/8"	0.37	0.82	0.33	1.13
HT08	HT08SS	HT08S6	1/2"	0.50	0.94	0.40	1.34
HT10	HT10SS	HT10S6	5/8"	0.62	1.06	0.46	1.54
HT14	HT14SS	HT14S6	7/8"	0.87	1.31	0.58	1.82
HT18	HT18SS	HT18S6	1 1/8"	1.12	1.57	0.70	2.08
HT22	HT22SS	HT22S6	1 3/8"	1.37	1.82	0.83	2.34
HT26	HT26SS	HT26S6	1 5/8"	1.62	2.07	0.96	2.60
HT34	HT34SS	HT34S6	2 1/8"	2.12	2.57	1.27	3.23

Contact Factory for Additional Sizes



Gold Electro-Galvanized Steel

Stainless Steel

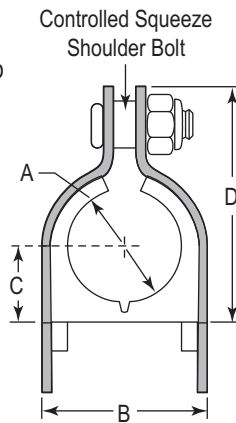


A patented "Living Hinge" allows the cushion to be spread apart for quick, easy installation.

**CUSH-A-CLAMP®** — Channel mounted clamping systems are ideal for multiple line runs, while absorbing shock and vibration, reducing unwanted noise and preventing galvanic corrosion. Cush-A-Clamp® fits any standard 1-5/8" wide channel.

Assembly consisting of steel clamp with locknut and thermoplastic elastomer cushion. All parts are marked for easy identification and packaged for small lot or bulk use. When specified, Cush-A-Clamp® assemblies up to 2", are available individually packaged.

**THE CLAMP** — Features a unique shoulder stud which is securely fastened to one clamp half. Steel clamps for tube sizes up to 1-3/8" have the **"Controlled Squeeze™"** design which eliminates over-tightening and rotation while a nylon-insert nut assures a positive lock. Clamps are available in steel (with electro-dichromate finish), and stainless steel type 304. (Contact factory for type 316).



**THE CUSHION** — Manufactured from a thermoplastic elastomer, it's built tough to withstand the effects of most oils, chemicals and industrial cleaning compounds, in temperatures from -50°F to 275°F. A patented "Living Hinge" allows the cushion to be spread apart for quick, easy installation. Interlock edges and channel locator legs ensure that the cushion remains in place.

**INSTALLATION** — One man, one tool time savings. Retrofits can be added without disassembly. A patented "Living Hinge" allows the cushion to be spread apart for quick, easy installation on sizes from 1/4" through 1-3/4".

Steel Part No.	Stainless-Steel Part No.	Dimension "A"			Dimensions (inches)			
		*Copper and Steel Tubing	Copper Water Pipe (Nom.)	Nom. Pipe Size	A	B	C	D
004T008	004NS008	1/4"	-	-	0.25	0.62	0.27	0.98
006T010	006NS010	3/8"	1/4"	-	0.37	0.82	0.33	1.13
008T012	008NS012	1/2"	3/8"	-	0.50	0.94	0.40	1.34
009N012	009NS012	-	-	1/4"	0.54	0.98	0.43	1.34
010T014	010NS014	5/8"	1/2"	-	0.62	1.06	0.46	1.54
011N014	011NS014	-	-	3/8"	0.67	1.13	0.49	1.54
012T016	012NS016	3/4"	5/8"	-	0.75	1.20	0.52	1.68
014N018	014NS018	-	-	1/2"	0.84	1.29	0.58	1.82
014T018	014NS018	7/8"	3/4"	-	0.87	1.31	0.58	1.82
016T020	016NS020	1"	-	-	1.00	1.44	0.65	1.95
017N022	017NS022	-	-	3/4"	1.05	1.57	0.70	2.08
018T022	018NS022	1-1/8"	1"	-	1.12	1.57	0.70	2.08
020T024	020NS024	1-1/4"	-	-	1.25	1.70	0.77	2.21
021N026	021NS026	-	-	1"	1.31	1.76	0.81	2.34
022T026	022NS026	1-3/8"	1-1/4"	-	1.37	1.82	0.83	2.34
024N028	024NS028	1-1/2"	-	-	1.50	1.95	0.90	2.47
026N030	026NS030	1-5/8"	1-1/2"	-	1.62	2.07	0.96	2.60
027N032	027NS032	-	-	1-1/4"	1.66	2.17	0.99	2.73
028N032	028NS032	1-3/4"	-	-	1.75	2.2	1.02	2.73
030N034	030NS034	1-7/8"	-	1-1/2"	1.90	2.32	1.09	2.86
032N036	032NS036	2"	-	-	2.00	2.45	1.15	3.04
034N040	034NS040	2-1/8"	2"	-	2.12	2.57	1.27	3.23
038N042	038NS042	2-1/4"	-	-	2.37	2.82	1.41	3.67
038N044	038NS044	2-3/8"	-	2"	2.37	2.82	1.41	3.67
040N046	040NS046	2-1/2"	-	-	2.50	2.94	1.46	3.79
042N048	042NS048	2-5/8"	2-1/2"	-	2.62	3.07	1.53	3.92
046N052	046NS052	2-7/8"	-	2-1/2"	2.87	3.32	1.66	4.17
050N054	050NS054	3"	-	-	3.00	3.57	1.78	4.42
050N056	050NS056	3-1/8"	3"	-	3.12	3.57	1.78	4.42
053N060	053NS060	3-5/16"	-	-	3.31	3.96	1.90	4.75
056N062	056NS062	3-1/2"	-	3"	3.50	3.95	1.97	4.79
058N064	058NS064	3-5/8"	3-1/2"	-	3.62	4.20	2.03	5.11
064N072	064NS072	4"	-	3-1/2"	4.00	4.45	2.28	5.11
066N074	066NS074	4-1/8"	4"	-	4.12	4.57	2.34	5.54
069N076	069NS076	4-5/16"	-	-	4.34	4.96	2.40	5.84
072N080	072NS080	4-1/2"	-	4"	4.50	4.95	2.53	5.92
082N090	082NS090	5-1/8"	5"	-	5.12	5.57	2.84	6.54
089N096	089NS096	-	-	5"	5.56	6.01	3.06	6.92
096N106	096NS106	6"	-	-	6.00	6.57	3.34	7.54
098N106	098NS106	6-1/8"	6"	-	6.12	6.57	3.34	7.54
106N114	106NS114	-	-	6"	6.62	7.07	3.59	8.23

\*Tube O.D. is Cushion I.D.; Design load deflection data available on request.

Loading Values Mounted in Standard 12 Gage Channel.					
Nut	Torque (in-lbs)	Products	Pullout (lbs)	Slip (lbs)	
				Along	Through
1/4"	40	004T008 - 022T026	1,000	100	100
5/16"	60	024T028 - 050N056	2,200	200	200
3/8"	150	053N050 - 106N114	3,600	600	350

Loads are the same for Stainless Steel Clamps (Example 024NS028)





Insert	Twist & Lock	Position Pipe	Snap In

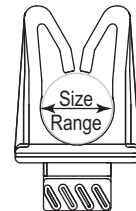


Position	Mount w/Screw	Position Pipe	Snap In
Side grooves provide Centering guide	Counter-sunk hole allows tightening of any type of #10 fastener		

The Cush-A-Claw Grabs on to your Tube, Pipe, or Hose and holds it in place. The unique one piece patent pending design allows for quick, simple, and easy installation. It will not rust because it's molded from the same choice TPE Material of some of our other products that you've come to know and trust.

- Easy Snap-in Installation of Tube, Pipe, or Hose
- Sure Grip Strut Base easily rotates into strut
- Will not Rust
- Non Conducting
- Saves Time and Money
- Temp Range: -50° to 275° F
- Works Great Indoors or Outdoors
- Six Sizes of Tube and Three Sizes of EMT
- Designed for Light Duty Loads and Applications
- Prevents Galvanic Corrosion of Dissimilar Metals
- An Excellent Alternative to Steel, Stainless Steel, or Galvanized Clamps.

O.D. Tube Size				EMTS Conduit Sizes			
Strut Mount Part #	Surface Mount Part #	Size		Strut Mount Part #	Surface Mount Part #	Size	
		O.D.	In.			O.D.	In.
CL-04	CLS-04	1/4"	0.250	EMT-1/2	EMTS-1/2	1/2"	0.706
CL-06	CLS-06	3/8"	0.375	EMT-3/4	EMTS-3/4	3/4"	0.922
CL-08	CLS-08	1/2"	0.500	EMT-1	EMTS-1	1"	1.163
CL-10	CLS-10	5/8"	0.625				
CL-12	CLS-12	3/4"	0.750				
CL-14	CLS-14	7/8"	0.875				
CL-18	CLS-18	1 1/8"	1.125				



75 Lbs. Load  
(safety Factor 3)



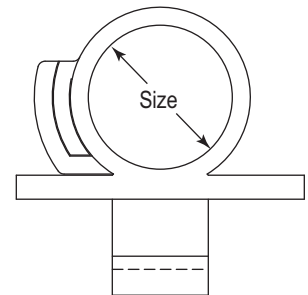
## CUSH-A-CLIP



A SIMPLE, ECONOMICAL, LIGHTWEIGHT HANGER FOR SUPPORTING TUBING

- Manufactured from polyamide alloy
- U.L. Rated
- Sizes from 3/8" to 1 1/8"
- One piece design makes installation a snap.
- No nuts to tighten, no parts to lose.
- Temperatures from -40°F to 275°F
- Secure but non-tightening design allows for expansion, greatly reducing joint fractures

Part Number	Tube Sizes Only	Wt./100
RPC-3/8"	3/8"	2.5
RPC-1/2"	1/2"	2.5
RPC-5/8"	5/8"	3.0
RPC-3/4"	3/4"	3.0
RPC-7/8"	7/8"	4.5
RPC-1-1/8"	1-1/8"	4.5



## CUSH-A-GRIP

Multi-size adjustment capability allows four clamp sizes to fit fifteen sizes of tube and pipe. Comes complete with stainless steel bolt and captured nut hardware.



### FEATURES

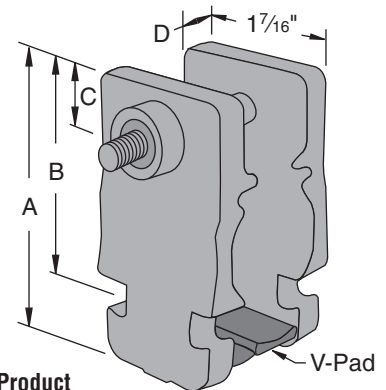
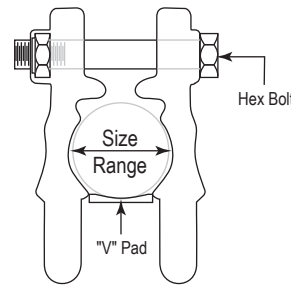
- Ten sizes of tube, five sizes of pipe
- Diameters from .25" to 1.31" (6mm to 32mm)

### ADVANTAGES

- Reduces inventory SKU's
- Simplifies take-offs and requirements on projects using both tube and pipe sizes
- Easy installation, Non conducting
- Permissible outdoors
- Temperature range: -40°F to +380°F
- No galvanic reaction, Will not rust

### BENEFITS

- Lowers overall inventory costs
- Works with screw or nut driver
- Resists vibration
- Use in place of steel clamps with steel tube
- Multi-environmental
- Covers a wide range of applications and maintains thermal barrier
- For use on copper tube
- Use in place of stainless, aluminum, PVC or hot dipped galvanized clamps



Patented Product

Part No.	O.D. Tube Sizes			Pipe Sizes	Metric Sizes	Diameters (in)
CG-10	1/4"	3/8"	1/2"	1/4"	6mm – 14mm	0.25 – 0.54
CG-20	5/8"	3/4"	7/8"	3/8" – 1/2"	15mm – 22mm	0.62 – 0.87
CG-30	7/8"	1"	1-1/8"	3/4"	22mm – 28mm	0.87 – 1.12
CG-40	1"	1-1/8"	1-1/4"	3/4" – 1"	26mm – 32mm	1.00 – 1.31

Part No.	Nominal Pipe Size	Dimensions				Hex Head Cap Screw & Lock Nut
		"A"	"B"	"C"	"D"	
CG-10	1/4"	1-15/16"	1-3/8"	3/8"	3/16"	1/4"-20 x 1-1/2"
CG-20	3/8"	2-3/8"	1-5/8"	7/16"	1/4"	1/4"-20 x 2"
CG-30	1/2"	2-9/16"	1-13/16"	7/16"	5/16"	1/4"-20 x 2"
CG-40	3/4"	2-11/16"	1-15/16"	7/16"	5/16"	1/4"-20 x 2"

- Manufactured from a thermoplastic elastomer, Cush-A-Strip™ is designed for use from -50°F to 275°F.
- Easy Stocking – Packaged in 20 foot rolls in an E-Z dispenser box for convenience in handling and storage. **Cush-A-Strip™ roll part number is S-716**
- Easy Measuring – Marked in 1/4" increments for fast measuring and cutting, while eliminating waste.
- Lock-lip edges ensure that Cush-A-Strip™ will remain in place with a balanced grip.
- Clamps ordered separately. They are available with a standard bolt and nylon lock nut in steel (electro-dichromate), and stainless steel, in sizes ranging from 1/4" tube to 6" pipe.

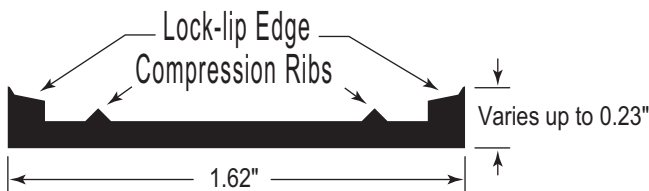


(1) Cut appropriate length strip using the cutting schedule shown on right.

(2) Place the pipe on the Cush-A-Strip™

(3) Insert the clamps in the strut

(4) Tighten the clamps.



Cush-A-Strip™ Cutting Guide					
Clamp Part No.		Dimensions (Inches)			
Gold Plated Steel	Stainless Steel Type 304	Clamp Size O.D.	Tube Size O.D.	Pipe Size (Nom.)	Cutting Schedule
N008C	NS008	1/2"	1/4"	–	7/8
N101C	NS101	5/8"	3/8"	–	1-1/8
N012C	NS012	3/4"	1/2"	1/4"	1-1/2
N014C	NS014	7/8"	5/8"	3/8"	2
N016C	NS016	1"	3/4"	–	2-1/4
N018C	NS018	1-1/8"	7/8"	1/2"	3
N020C	NS020	1-1/4"	1"	3/4"	3-1/4
N022C	NS022	1-3/8"	1-1/8"	–	3-5/8
N024C	NS024	1-1/2"	1-3/16"	–	3-7/8
N024C	NS024	1-1/2"	1-1/4"	1"	4
N026C	NS026	1-5/8"	1-3/8"	–	4-1/2
N028C	NS028	1-3/4"	1-1/2"	–	4-7/8
N030C	CS030	1-7/8"	1-5/8"	1-1/4"	5-1/4
N032C	CS032	2"	1-3/4"	–	5-1/2
N034C	CS034	2-1/8"	1-7/8"	1-1/2"	6
N036C	CS036	2-1/4"	2"	–	6-3/8
N038C	CS038	2-3/8"	2-1/8"	–	6-3/4
N040C	CS040	2-1/2"	2-1/4"	–	7-1/4
N042C	CS042	2-5/8"	2-3/8"	2"	7-1/2
N044C	CS044	2-3/4"	2-1/2"	–	8
N048C	CS048	3"	2-3/4"	–	8-3/4
N050C	CS050	3-1/8"	2-7/8"	2-1/2"	9-1/4
N054C	CS054	3-1/4"	3"	–	9-1/2
N060C	CS060	3-3/4"	3-1/2"	3"	11
N068C	CS068	4-1/4"	4"	3-1/2"	12-1/4
N076C	CS076	4-3/4"	4-1/2"	4"	14
N092C	CS092	5-3/4"	–	5"	15-1/2
N110C	CS110	6-7/8"	–	6"	18-1/2

\* Gold Plated Steel Clamps Supplied with Fixed Stud and Nylon Lock Nut  
 \* Stainless Steel Clamps Supplied with fixed Stud and Nylon Lock Nut from 1/2" through 1-3/4" Sizes and 1-7/8" through 6-7/8" Sizes are supplied with a Loose Bolt and Hex Nut



Gold Electro-Galvanized Steel

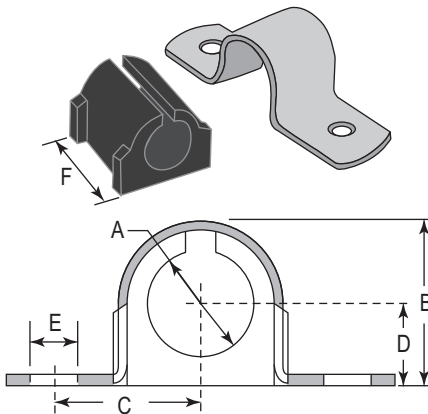


Stainless Steel

The Omega Series™ clamp assembly retains, guides, protects and uniformly spaces line runs. Attached with two standard fasteners to any flat surface, the Omega Series™ clamp eliminates the use of special channels, providing a savings in both space and cost. They go up fast, lines are rigid and look neat.

**THE CLAMP** — Steel with electro-dichromate finish, or stainless steel type 304.

**THE CUSHION** — Manufactured from a thermoplastic elastomer, it's built tough to withstand the effects of most oils, chemicals and industrial cleaning compounds, in temperatures from -50°F to 275°F. Interlock edge ensures that the cushion remains in place.

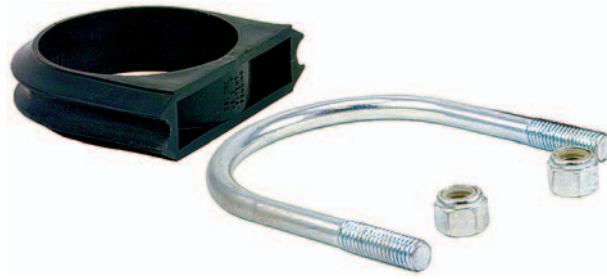


Assembly consists of clamp and thermoplastic elastomer cushion. Fasteners not included.

Steel Part No.	Stainless Steel Part No.	Copper & Steel Tubing O.D.	Copper Water Pipe (Nom.)	Pipe Size (Nom.)	Dimensions (inches)						Hanging Design Load
					A	B	C	D	E	F	
004M007	004MS007	1/4"	-	-	0.25	0.48	0.60	0.22	0.26	0.78	50
006M008	006MS008	3/8"	1/4"	-	0.37	0.62	0.66	0.31	0.26	0.81	50
008M011	008MS011	1/2"	3/8"	1/4"	0.50	0.81	0.83	0.40	0.26	0.98	50
010M013	010MS013	5/8"	1/2"	3/8"	0.62	0.93	0.85	0.46	0.26	0.98	50
012M015	012MS015	3/4"	5/8"	-	0.75	1.02	0.90	0.50	0.26	0.98	50
014M017	014MS017	7/8"	3/4"	1/2"	0.87	1.12	1.03	0.53	0.26	0.98	50
016M019	016MS019	1"	-	-	1.00	1.24	1.04	0.59	0.26	0.98	50
018M020	018MS020	-	-	3/4"	1.05	1.40	1.11	0.70	0.26	0.98	50
018M021	018MS021	1-1/8"	1"	-	1.12	1.40	1.17	0.70	0.26	0.98	50
020M024	020MS024	1-1/4"	-	-	1.25	1.60	1.20	0.77	0.26	1.56	50
021M026	021MS026	-	-	1"	1.31	1.71	1.28	0.81	0.26	1.56	50
022M026	022MS026	1-3/8"	1-1/4"	-	1.37	1.71	1.28	0.83	0.26	1.56	50
024M028	024MS028	1-1/2"	-	-	1.50	1.85	1.36	0.90	0.26	1.56	200
026M030	026MS030	1-5/8"	1-1/2"	-	1.62	1.98	1.43	0.96	0.26	1.56	200
027M032	027MS032	-	-	1-1/4"	1.66	2.12	1.55	0.99	0.34	1.56	400
028M032	028MS032	1-3/4"	-	-	1.75	2.12	1.55	1.02	0.34	1.56	400
030M034	030MS034	1-7/8"	-	1-1/2"	1.87	2.25	1.64	1.09	0.34	1.56	400
032M036	032MS036	2"	-	-	2.00	2.38	1.69	1.15	0.34	1.56	400
034M040	034MS040	2-1/8"	-	-	2.12	2.62	1.86	1.27	0.34	1.56	400
038M044	038MS044	2-3/8"	-	2"	2.37	2.88	1.94	1.41	0.34	1.56	400
040M046	040MS046	2-1/2"	-	-	2.50	3.00	2.00	1.47	0.34	1.56	400
042M048	042MS048	2-5/8"	2-1/2"	-	2.62	3.13	2.07	1.53	0.34	1.56	400
046M052	046MS052	2-7/8"	-	2-1/2"	2.87	3.38	2.19	1.65	0.34	1.56	400
050M056	050MS056	3-1/8"	3"	-	3.12	3.68	2.32	1.78	0.34	1.56	400
056M062	056MS062	3-1/2"	-	3"	3.50	4.06	2.50	1.97	0.34	1.56	400
058M064	058MS064	3-5/8"	3-1/2"	-	3.62	4.19	2.57	2.03	0.34	1.56	700
064M072	064MS072	4"	-	3-1/2"	4.00	4.68	2.82	2.28	0.34	1.56	700
066M074	066MS074	4-1/8"	4"	-	4.12	4.84	3.05	2.34	0.43	1.56	800
072M080	072MS080	4-1/2"	-	4"	4.50	5.22	3.24	2.53	0.43	1.56	800
082M090	082MS090	5-1/8"	5"	-	5.12	5.82	3.55	2.84	0.43	1.56	800
089M096	089MS096	-	-	5"	5.56	6.31	4.00	3.06	0.56	1.56	1,200
098M106	098MS106	6-1/8"	6"	-	6.12	6.90	4.31	3.34	0.56	1.56	1,200
106M114	106MS114	-	-	6"	6.62	7.39	4.56	3.58	0.56	1.56	1,200

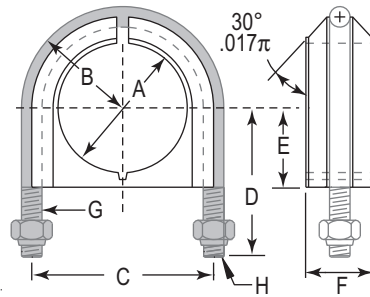
PART NO. SUFFIX	Cushions	Example
NONE	Thermoplastic elastomer	004M007 (STEEL) 004MS007 (STAINLESS STEEL)
N	Flame Retardant	004M007N (STEEL) 004MS007N (STAINLESS STEEL)
NH	Flame Retardant Halogen Free	004M007NH (STEEL) 004MS007NH (STAINLESS STEEL)

Note: Fasteners not included.

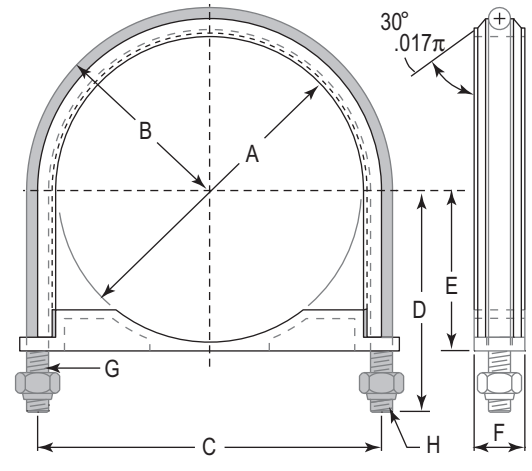


Designed for the tough jobs, the **Alpha Series™** U-Bolt Assembly secures pipe runs to any flat surface. The cushion design provides total load distribution, allowing the U-Bolt to become a full contact hanger, eliminating knife-edge loading. The U-Bolt traps and secures the cushion in place to prevent lateral movement, while nylon insert locknuts provide a positive lock.

Alpha Series™ U-Bolt Assembly conforms to MIL-S-901D for shock testing.



1/2" thru 6" assembly.



8" thru 12" assembly – Two piece cushion design

Assy. Part No.	Pipe Size (Nom.)	Tube Size (O.D.)	Dimensions (Inches)								Torque	Design Load	Slip Through
			A Dia.	B Radius	C	D	E	F	G	H			
UB1/2PA	1/2"	–	0.840	0.80	1.60	1.50	0.67	0.68	1/4	1/4-20 UNC-2B	100	485	500
UB7/8TA	–	7/8"	0.875	0.80	1.60	1.50	0.67	0.68	1/4	1/4-20 UNC-2B	100	485	500
UB3/4PA	3/4"	–	1.05	0.90	1.80	1.60	0.78	0.68	1/4	1/4-20 UNC-2B	100	485	500
UB1TA	–	1"	1.00	0.90	1.80	1.60	0.78	0.68	1/4	1/4-20 UNC-2B	100	485	500
UB11/4TA	–	1-1/4"	1.25	1.02	2.05	1.70	0.91	0.68	1/4	1/4-20 UNC-2B	100	485	500
UB1PA	1"	–	1.31	1.02	2.05	1.70	0.91	0.68	1/4	1/4-20 UNC-2B	100	485	500
UB1 3/8TA	–	1-3/8"	1.375	1.02	2.05	1.70	0.91	0.68	1/4	1/4-20 UNC-2B	100	485	500
UB1-1/4PA	1-1/4"	–	1.66	1.27	2.55	2.10	1.08	1.24	3/8	3/8-16 UNC-2B	150	1,220	500
UB1-1/2PA	1-1/2"	–	1.90	1.40	2.80	2.20	1.19	1.24	3/8	3/8-16 UNC-2B	150	1,220	500
UB2PA	2"	–	2.37	1.67	3.35	2.50	1.45	1.24	3/8	3/8-16 UNC-2B	150	1,220	500
UB2-1/2PA	2-1/2"	–	2.87	1.95	3.90	3.00	1.69	1.24	1/2	1/2-13 UNC-2B	200	2,260	500
UB3PA	3"	–	3.50	2.27	4.55	3.30	2.00	1.24	1/2	1/2-13 UNC-2B	200	2,260	500
UB3-1/2PA	3-1/2"	–	4.00	2.52	5.05	3.70	2.25	1.24	1/2	1/2-13 UNC-2B	200	2,260	500
UB4PA	4"	–	4.50	2.50	5.50	3.90	2.50	1.24	1/2	1/2-13 UNC-2B	200	2,260	500
UB5PA	5"	–	5.56	3.25	6.56	4.50	3.03	1.24	1/2	1/2-13 UNC-2B	200	2,260	500
UB6PA	6"	–	6.62	3.87	7.75	5.40	3.56	1.44	5/8	5/8-11 UNC-2B	250	3,620	500
UB8PA	8"	–	8.62	4.85	9.82	6.40	4.56	1.44	5/8	5/8-11 UNC-2B	250	3,620	500
UB10PA	10"	–	10.75	6.08	12.16	7.70	5.68	1.65	3/4	3/4-10 UNC-2B	275	5,420	500
UB12PA	12"	–	12.75	7.13	14.25	8.70	6.68	1.65	3/4	3/4-10 UNC-2B	275	5,420	500

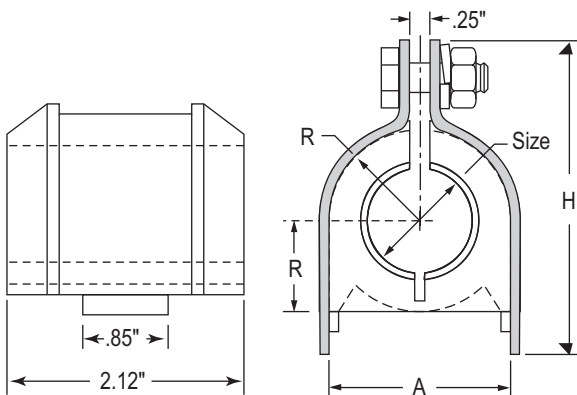
SUFFIX	Clamp	Cushion	Example
NONE	Electro-galvanized	Thermoplastic elastomer	UB1/2PA
6	Stainless Steel, Type 316	Thermoplastic elastomer	UB1/2PA6
N6	Stainless Steel, Type 316	 Flame Retardant	UB1/2PAN6
N	Electro-galvanized		UB1/2PAN
NH	Electro-galvanized	 Flame Retardant Halogen Free	UB1/2PANH
NH6	Stainless Steel, Type 316		UB1/2PANH6



The hinged cushion allows easy installation of the wire, but the components will not get separated and lost or broken.

Replaces Porcelain and Maple Cable Clamp. Assembly consists of thermoplastic elastomer cushion with plated or stainless steel clamp. Plated steel and stainless are both supplied with Silicon Bronze bolt and nut.

- Non-breakable material
- Chemical and UV resistant
- **U.L. Listed** - Burning stops within 10 seconds after two applications of ten seconds each of a flame to a test bar with no flaming drips.
- Plated Steel, or Stainless steel clamps
- Tapered flange to protect cable
- Dielectric strength 640 volts per mil
- One piece cushion design, available with Flame retardant / Halogen Free cushions
- Silicon Bronze Hardware used to Breakup the Magnetic field around the Cable at the Clamping Location.



Part No.	Dimensions (Inches)			Total Assy. Height - H
	Size/ Hole Dia.	A	R	
006CC018	3/8	1.12	0.56	1.82
008CC018	1/2	1.12	0.56	1.82
010CC018	5/8	1.12	0.56	1.82
012CC026	3/4	1.62	0.81	2.34
014CC026	7/8	1.62	0.81	2.34
016CC026	1	1.62	0.81	2.34
018CC026	1-1/8	1.62	0.81	2.34
020CC034	1-1/4	2.12	1.06	2.86
022CC034	1-3/8	2.12	1.06	2.86
024CC034	1-1/2	2.12	1.06	2.86
026CC034	1-5/8	2.12	1.06	2.86
028CC042	1-3/4	2.62	1.31	3.50
030CC042	1-7/8	2.62	1.31	3.50
032CC042	2	2.62	1.31	3.50
034CC042	2-1/8	2.62	1.31	3.50
036CC050	2-1/4	3.12	1.56	4.05
038CC050	2-3/8	3.12	1.56	4.05
040CC050	2-1/2	3.12	1.56	4.05
042CC050	2-5/8	3.12	1.56	4.05
044CC058	2-3/4	3.62	1.81	4.75
046CC058	2-7/8	3.62	1.81	4.75
048CC058	3	3.62	1.81	4.75
050CC058	3-1/8	3.62	1.81	4.75
052CC066	3-1/4	4.12	2.06	5.125
054CC066	3-3/8	4.12	2.06	5.125
056CC066	3-1/2	4.12	2.06	5.125
058CC066	3-5/8	4.12	2.06	5.125
060CC074	3-3/4	4.62	2.31	5.54
062CC074	3-7/8	4.62	2.31	5.54
064CC074	4	4.62	2.31	5.54
066CC074	4-1/8	4.62	2.31	5.54
068CC080	4-1/4	5.00	2.50	5.92
070CC080	4-3/8	5.00	2.50	5.92
072CC080	4-1/2	5.00	2.50	5.92

 SUFFIX	Note: All clamps have Silicon Bronze Hardware		
	Clamp	Cushion	Example
Z	Plated Steel	Flame Retardant	006CC018Z
S	Stainless Steel	Flame Retardant	006CC018S
ZH	Plated Steel	Flame Retardant Halogen Free	006CC018ZH
SH	Stainless Steel	Flame Retardant Halogen Free	006CC018SH

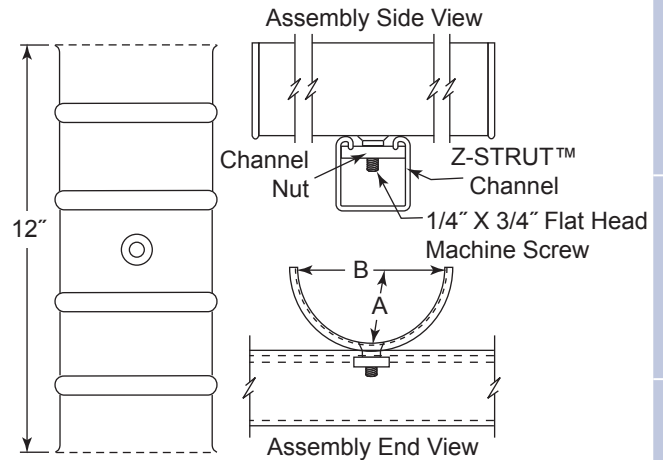
## INSULATION SADDLE

The Saddle-Up Pipe Insulation Saddle is a formed metal shield designed to allow insulated refrigeration pipe or tubing to pass through the support without need to compromise the vapor barrier and protects from crushing or damage at hanger and support locations. Made from 20 gage electro-galvanized steel the ribbed design along its 12 inch length offers the superior support needed to spread out loading on insulation which reduces the potential for internal cavity creation between the pipe and insulation. The Z-Strut mounting option provides a time tested secure and safe attachment method so there is no need for other tie downs to the support.



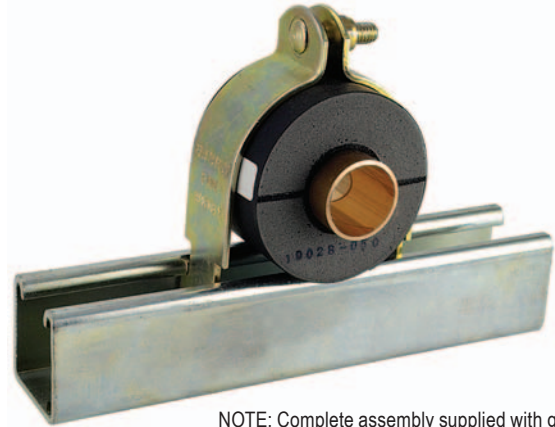
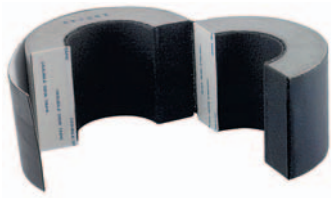
### OTHER FEATURES INCLUDE:

- Shipped with all necessary hardware to attach to Z-Strut or any other industry standard 1 5/8" wide strut channel.
- Features flared edges to protect pipe insulation jacketing.
- Each Saddle individually marked with part number
- Counter Sunk attachment Hole and Flat Head Machine Screw prevent possible damage to insulation.
- Electro-Galvanized Steel provides excellent rust protection and has no exposed fabricated edges.



Dimensions (Inches)			1/2" Insulation		3/4" Insulation		1" Insulation		1 1/2" Insulation	
Part Number	B Saddle Width	A Radius	OD Tube Size	OD With Insulation	OD Tube Size	OD With Insulation	OD Tube Size	OD With Insulation	OD Tube Size	OD With Insulation
SD150	1 1/2	3/4	3/8	1 3/8	-	-	-	-	-	-
			1/2	1 1/2	-	-	-	-	-	-
SD200	2	1	5/8	1 5/8	3/8	1 7/8	-	-	-	-
			3/4	1 3/4	1/2	2	-	-	-	-
			7/8	1 7/8	-	-	-	-	-	-
SD250	2 1/2	1 1/4	1 1/8	2 1/8	5/8	2 1/8	3/8	2 3/8	-	-
			1 3/8	2 3/8	3/4	2 1/4	1/2	2 1/2	-	-
			-	-	7/8	2 3/8	-	-	-	-
SD300	3	1 1/2	1 5/8	2 5/8	1 1/8	2 5/8	5/8	2 5/8	-	-
			-	-	1 3/8	2 7/8	3/4	2 3/4	-	-
			-	-	-	-	7/8	2 7/8	-	-
SD350	3 1/2	1 3/4	2 1/8	3 1/8	1 5/8	3 1/8	1 1/8	3 1/8	3/8	3 3/8
			2 3/8	3 3/8	-	-	1 3/8	3 3/8	1/2	3 1/2
SD450	4 1/2	2 1/4	2 5/8	3 5/8	2 1/8	3 5/8	1 5/8	3 5/8	5/8	3 5/8
			-	-	2 3/8	3 7/8	-	-	3/4	3 3/4
			-	-	-	-	-	-	7/8	3 7/8
			3 1/8	4 1/8	2 5/8	4 1/8	2 1/8	4 1/8	1 1/8	4 1/8
SD550	5 1/2	2 3/4	-	-	-	-	-	-	1 3/8	4 3/8
			3 5/8	4 5/8	3 1/8	4 5/8	2 5/8	4 5/8	1 5/8	4 5/8
			4 1/8	5 1/8	3 5/8	5 1/8	3 1/8	5 1/8	2 1/8	5 1/8
SD650	6 1/2	3 1/4	-	-	-	-	-	-	2 3/8	5 3/8
			-	-	4 1/8	5 5/8	3 5/8	5 5/8	2 5/8	5 5/8
			-	-	-	-	4 1/8	6 1/8	3 1/8	6 1/8

## AIRTIGHT CRUSH-RESISTANT INSULATION CLAMP



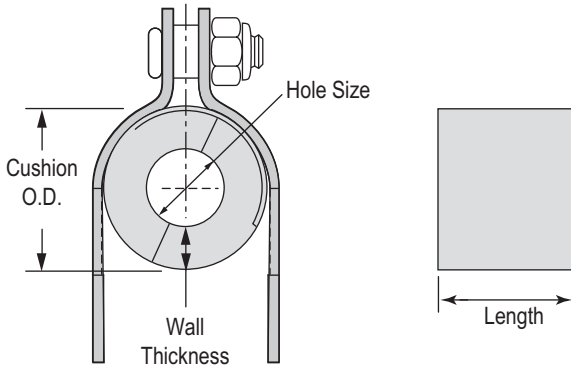
NOTE: Complete assembly supplied with gold electro-galvanized channel clamp and hardware

**Cush-A-Therm™ Clamp** is a perfect crush-resistant airtight seal for chilled refrigeration or mechanical pipe lines that require continuous insulation.

The rigid foam construction has an insulating tape inner lining which supports tube and absorbs vibration of operating pipe lines.

The outer cover consists of a special rubber coating which seals the cushion after installation in order to prevent condensation.

It's strong closed-cell structure is ideal for liquid cooling lines to prevent condensation, save energy, and maintain the vapor barrier.



### FEATURES

- Temperature range: -70°F to +250°F (-200°C to +125°C)
- Flammability is Self-Extinguishing as tested under ASTM D 635
- Maintains thermal barrier protection
- Prevents condensation
- Properly supports pipe and tube
- Absorbs vibration
- Polyurethane foam laminated with a rubber lining

Dimensions (Inches)					Nominal 1/2" Wall Thickness		Nominal 3/4" Wall Thickness		Nominal 1" Wall Thickness		Nominal 1-1/2" Wall Thickness		Nominal 2" Wall Thickness	
Hole Size	Copper I.D.	Pipe O.D.	IPS	Length	Part No.	Cushion O.D.	Part No.	Cushion O.D.	Part No.	Cushion O.D.	Part No.	Cushion O.D.	Part No.	Cushion O.D.
3/8 ID	1/4	3/8	-	2.953"	UX3812	1.33	UX3834	1.81	UX3810	2.31	UX3815	3.31	-	
1/2 ID	3/8	1/2	1/4	2.953"	UX1212	1.44	UX1234	1.89	UX1210	2.39	UX1215	3.39	-	
5/8 ID	1/2	5/8	3/8	2.953"	UX5812	1.56	UX5834	2.05	UX5810	2.54	UX5815	3.54	UX5820	4.54
3/4 ID	5/8	3/4	-	2.953"	UX3412	1.69	UX3434	2.22	UX3410	2.71	UX3415	3.71	UX3420	4.71
7/8 ID	3/4	7/8	1/2	2.953"	UX7812	1.81	UX7834	2.44	UX7810	2.82	UX7815	3.82	UX7820	4.82
1-1/8 ID	1	1-1/8	3/4	2.953"	UX11812	2.19	UX11834	2.76	UX11810	3.06	UX11815	4.06	UX11820	5.06
1-3/8 ID	1-1/4	1-3/8	1	2.953"	UX13812	2.31	UX13834	3.19	UX13810	3.33	UX13815	4.33	UX13820	5.33
1-5/8 ID	1-1/2	1-5/8	1-1/4	2.953"	UX15812	2.56	UX15834	3.35	UX15810	3.65	UX15815	4.65	UX15820	5.65
1-7/8 ID	-	1-7/8		2.953"	UX17812	2.81	UX17834	3.58	UX17810	4.43	UX17815	5.43	UX17820	6.43
2-1/8 ID	2	2-1/8	-	2.953"	UX21812	3.23	UX21834	3.86	UX21810	4.16	UX21815	5.16	UX21820	6.16
2-3/8 ID	2-1/4	2-3/8	2	2.953"	UX23812	3.48	UX23834	4.29	UX23810	3.92	UX23815	4.92	UX23820	5.92
2-5/8 ID	2-1/2	2-5/8	-	3.937"	UX25812	4.13	UX25834	4.87	UX25810	4.87	UX25815	5.87	UX25820	6.87
2-7/8 ID	-	2-7/8	2-1/2	3.937"	UX27812	4.38	UX27834	4.57	UX27810	4.67	UX27815	5.67	UX27820	6.67
3-1/8 ID	3	3-1/8	-	3.937"	UX31812	4.63	UX31834	5.00	UX31810	5.14	UX31815	6.14	UX31820	7.14
3-1/2 ID	-	3-1/2	3	3.937"	UX31212	4.88	UX31234	5.35	UX31210	5.89	UX31215	6.89	UX31220	7.89
3-5/8 ID	3-1/2	3-5/8	-	3.937"	UX35812	5.13	UX35834	5.94	UX35810	6.44	UX35815	7.44	UX35820	8.44
4-1/8 ID	4	4-1/8	3-1/2	3.937"	UX41812	5.63	UX41834	6.14	UX41810	6.48	UX41815	7.48	UX41820	8.48

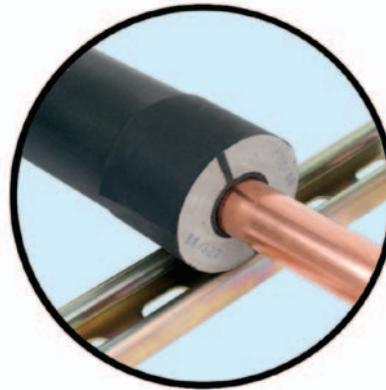


# AIRTIGHT CRUSH-RESISTANT INSULATION CLAMP

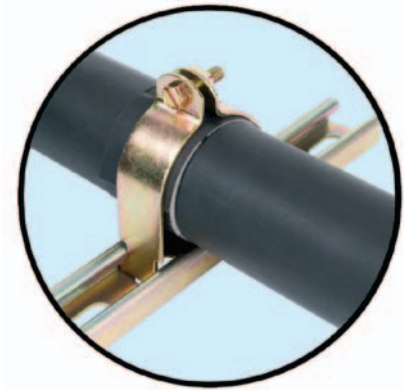
INSTALLATION IS AS EASY AS 1-2-3!



1. Insulation slides over pipes. Self adhesive surfaces provide seal.

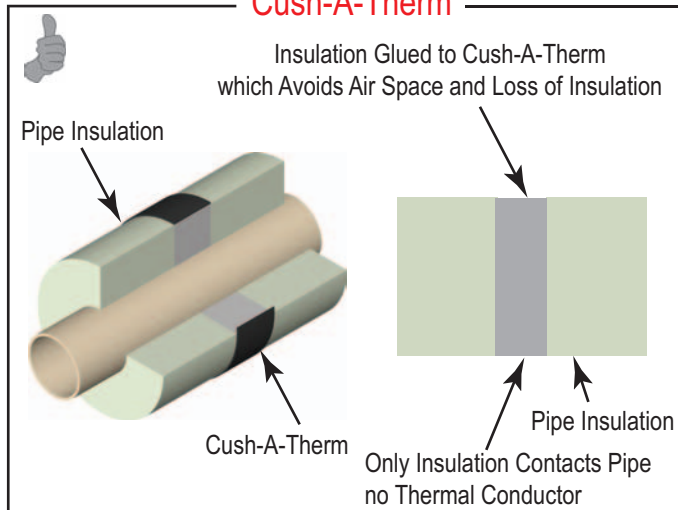


2 Put in place and glue to insulation.

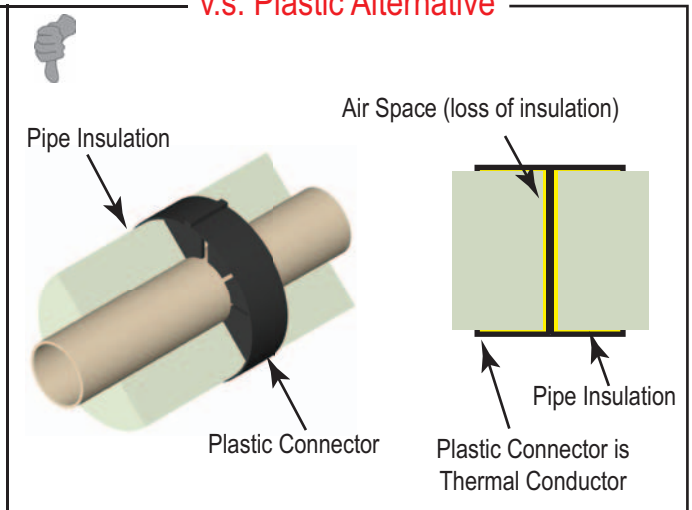


3. Wrap and seal with ProTape.

## Cush-A-Therm



## v.s. Plastic Alternative



## ASHRAE Insulation Recommendations

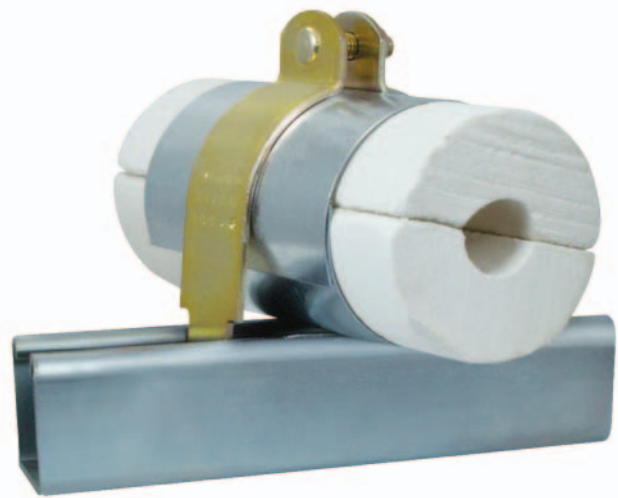
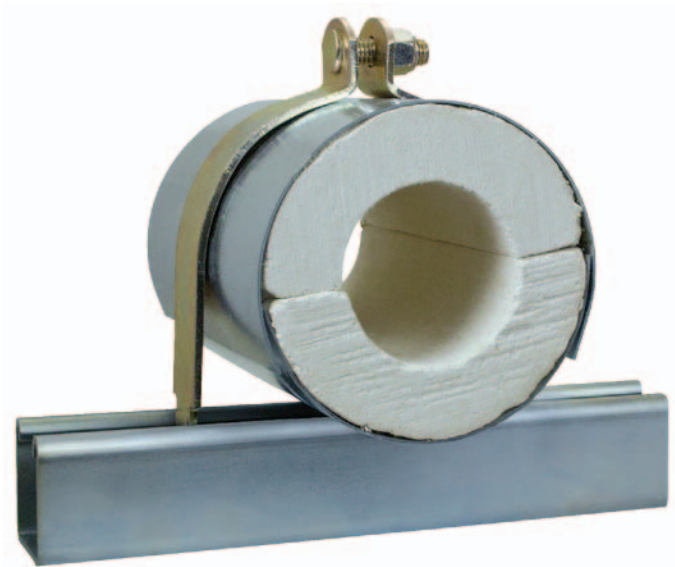
Cush-A-Therm is designed to meet the ASHRAE recommendations for insulation for mechanical systems which indicate that insulated pipe hangers should provide the following:

1. Complete sealing of pipe against water vapor ingress
2. No energy transfer of cold to supporting clamp to prevent condensation of water and possible growth of mold. If the support incasing the insulation is in contact with the pipe or tube and supported by a metallic clamp, which is not protected by insulation, below ambient temperatures will be transfer to the clamp causing energy transfer and condensation.
3. No interruption of the insulation envelope
4. Limit or avoid compression at support location

ASHRAE Section 23.13-23.14 further states “when the goal is avoiding compression of low-compressive-strength insulation products, it is recommended to use high-strength insulation inserts made of a product that offers the desired compressive strength and other necessary performance properties. Other higher-strength materials that are not thermal insulation material and interrupt the insulation envelope, or do not allow complete sealing of an insulation system against water vapor ingress are not recommended for supporting insulated piping on pipe hangers. Note that wood blocks have poor thermal conductivity and are not recommended, especially for cold pipe systems.”

Insulated cold piping should receive special attention when exposed to ambient or unconditioned air. The Cush-A-Therm is a product that seals out air, and insulates the pipe/tube from the supporting clamp, and is therefore in compliance with the 2013 ASHRAE insulation recommendations.

## CAL-CLAMP CRUSH RESISTANT INSULATION



### MODEL "HW" - For Hot or Cold applications

- Works equally well on both hot and cold lines.
- Includes the strut clamps required for installation with strut.
- Special order insulation lengths, double sheet metal wrap, load bearing plates and alternate sheet metal gauges are available upon request.

### MODEL "CWP" - For applications requiring a wet lag insulation

- Insulations extends 1" beyond sheet metal.
- The minimum length for our "CWP" insert is 6" .
- Includes the strut clamps required for installation with strut.
- Special order insulation lengths, double sheet metal wrap, load bearing plates and alternate sheet metal gauges are available upon request.

Maximum Allowable Load (lbs)	
Pipe Size	HW/CWP
1/2"	51
3/4"	62
1"	72
1-1/4"	92
1-1/2"	123
2"	164
2-1/2"	225
3"	276
4"	388
5"	500
6"	612
8"	827
10"	1102
12"	1326

I.P.S. NOMINAL	Insulation Length Specification (in.)					
	Insulation Thickness					
	1"	1 1/2"	2"	2 1/2"	3"	4"
1/2" to 1-1/2"	4**			6"		
2"	6"					
2-1/2" to 6"	6"			9"		
8" to 10"	9"					
12" to 18"	12"					

\*CWP Model Inserts have a minimum length of 6"

\*\*Larger Sizes Available Upon Request

Material:

- Asbestos Free Calcium Silicate (Cellular Glass and Polyurethane also available upon request), treated for water resistance, encased in a 360 degree A-653 Galvanized Sheet Metal jacket (304SS and 316SS available upon request).
- Minimum 140PSI compressive strength. Working Temperature is 42 to 1200 degrees F. Lower temps upon request.

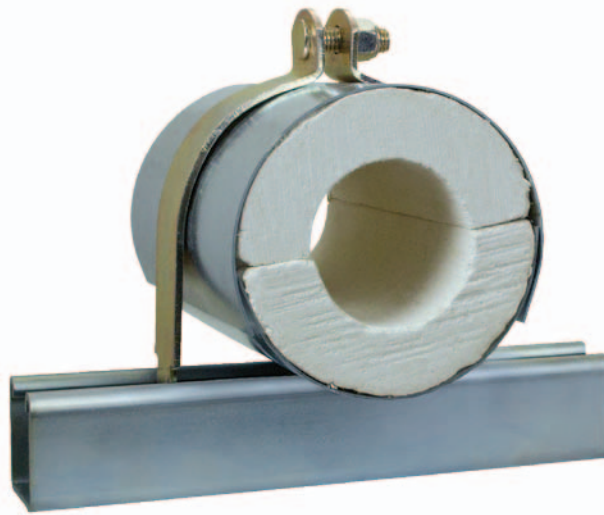
I.P.S. NOMINAL	Sheet Metal Gauge <sup>1</sup>					
	Insulation Thickness					
	1"	1 1/2"	2"	2 1/2"	3"	4"
1/2" to 1-1/2"	24			20		
2" to 5"	20					
6"	20				16	
8" to 24"	16					

<sup>1</sup>A double thickness of sheet metal is recommended on the lower half when used with rollers or when hanger span exceeds ten feet.

## MODEL "HW"

For Hot or Cold applications

Strut Clamp included



Model HWP, Insulation and Strut Clamps

IPS	Pipe OD	1/2"		1"		1 1/2"		2"		2 1/2"		3"	
		Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.
3/4"	1.05	HWP3412	2.16	HWP3410	2.82	HWP3415	3.95	HWP3420	4.95	HWP3425	-	HWP3430	-
1"	1.315	HWP112	2.41	HWP110	3.45	HWP115	4.45	HWP120	5.51	HWP125	-	HWP130	-
1 1/4"	1.66	HWP11412	2.72	HWP11410	3.45	HWP11415	4.95	HWP11420	5.51	HWP11425	-	HWP11430	-
1 1/2"	1.99	HWP11212	2.99	HWP11210	3.95	HWP11215	4.95	HWP11220	6.57	HWP11225	7.57	HWP11230	8.57
2"	2.375	HWP212	3.42	HWP210	4.45	HWP215	5.51	HWP220	6.57	HWP225	7.57	HWP230	8.57
2 1/2"	2.875	HWP21212	3.93	HWP21210	4.95	HWP21215	6.57	HWP21220	7.57	HWP21225	8.57	HWP21230	9.57
3"	3.5	HWP312	4.56	HWP310	5.51	HWP315	6.57	HWP320	7.57	HWP325	8.57	HWP330	9.57
3 1/2"	4	HWP31212	5.07	HWP31210	6.57	HWP31215	7.57	HWP31220	8.57	HWP31225	9.57	HWP31230	10.7
4"	4.5	HWP412	5.57	HWP410	6.57	HWP415	7.57	HWP420	8.57	HWP425	9.57	HWP430	10.7
5"	5.563	HWP512	6.64	HWP510	7.57	HWP515	8.57	HWP520	9.57	HWP525	10.7	HWP530	11.7
6"	6.625	HWP612	7.71	HWP610	8.57	HWP615	9.57	HWP620	10.7	HWP625	11.7	HWP630	12.7
8"	8.625	HWP812	9.74	HWP810	10.7	HWP815	11.7	HWP820	12.7	HWP825	13.95	HWP830	14.95
10"	10.75	HWP1012	11.87	HWP1010	12.7	HWP1015	13.95	HWP1020	14.95	HWP1025	15.95	HWP1030	16.95
12"	12.75	HWP1212	13.88	HWP1210	14.95	HWP1215	15.95	HWP1220	16.95	HWP1225	17.95	HWP1230	18.95

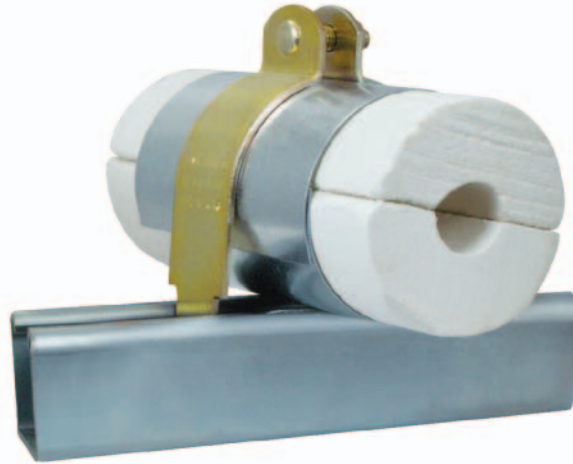
Model HWT, Copper Tube Sizes, Insulation and Strut Clamps

Copper Tube	Tube OD	1/2"		1"		1 1/2"		2"		2 1/2"		3"	
		Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.
1/2"	5/8"	HWT5812	1.66	HWT5810	2.82	HWT5815	3.45	-	-	-	-	-	-
3/4"	7/8"	HWT7812	1.92	HWT7810	2.82	HWT7815	3.95	HWT7820	4.95	-	-	-	-
1"	1-1/8"	HWT11812	2.16	HWT11810	2.82	HWT11815	3.95	HWT11820	4.95	-	-	-	-
1 1/4"	1-3/8"	HWT13812	2.41	HWT13810	3.45	HWT13815	4.45	HWT13820	5.51	-	-	-	-
1 1/2"	1-5/8"	HWT15812	2.72	HWT15810	3.45	HWT15815	4.95	HWT15820	5.51	-	-	-	-
2"	2-1/8"	HWT21812	3.16	HWT21810	3.95	HWT21815	4.95	HWT21820	6.57	HWT21825	7.57	HWT21830	8.57
2 1/2"	2-5/8"	HWT25812	3.66	HWT25810	4.45	HWT25815	5.51	HWT25820	6.57	HWT25825	7.57	HWT25830	8.57
3"	3-1/8"	HWT31812	4.16	HWT31810	4.95	HWT31815	6.57	HWT31820	7.57	HWT31825	8.57	HWT31830	9.57
4"	4-1/8"	HWT41812	5.16	HWT41810	6.57	HWT41815	7.57	HWT41820	8.57	HWT41825	9.57	HWT41830	10.7
5"	5-1/8"	HWT51812	6.16	HWT51810	7.57	HWT51815	8.57	HWT51820	9.57	HWT51825	10.7	HWT51830	11.7
6"	6-1/8"	HWT61812	7.16	HWT61810	8.57	HWT61815	9.57	HWT61820	10.7	HWT61825	11.7	HWT61830	12.7

## MODEL "CW"

For applications requiring a wet lag insulation. Insulations extends 1" beyond metal.

Strut Clamp included



Model CWP, Insulation and Strut Clamps

IPS	Pipe OD	1/2"		1"		1 1/2"		2"		2 1/2"		3"	
		Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.
3/4"	1.05	CWP3412	2.16	CWP3410	2.82	CWP3415	3.95	CWP3420	4.95	CWP3425	-	CWP3430	-
1"	1.315	CWP112	2.41	CWP110	3.45	CWP115	4.45	CWP120	5.51	CWP125	-	CWP130	-
1 1/4"	1.66	CWP11412	2.72	CWP11410	3.45	CWP11415	4.95	CWP11420	5.51	CWP11425	-	CWP11430	-
1 1/2"	1.99	CWP11212	2.99	CWP11210	3.95	CWP11215	4.95	CWP11220	6.57	CWP11225	7.57	CWP11230	8.57
2"	2.375	CWP212	3.42	CWP210	4.45	CWP215	5.51	CWP220	6.57	CWP225	7.57	CWP230	8.57
2 1/2"	2.875	CWP21212	3.93	CWP21210	4.95	CWP21215	6.57	CWP21220	7.57	CWP21225	8.57	CWP21230	9.57
3"	3.5	CWP312	4.56	CWP310	5.51	CWP315	6.57	CWP320	7.57	CWP325	8.57	CWP330	9.57
3 1/2"	4	CWP31212	5.07	CWP31210	6.57	CWP31215	7.57	CWP31220	8.57	CWP31225	9.57	CWP31230	10.7
4"	4.5	CWP412	5.57	CWP410	6.57	CWP415	7.57	CWP420	8.57	CWP425	9.57	CWP430	10.7
5"	5.563	CWP512	6.64	CWP510	7.57	CWP515	8.57	CWP520	9.57	CWP525	10.7	CWP530	11.7
6"	6.625	CWP612	7.71	CWP610	8.57	CWP615	9.57	CWP620	10.7	CWP625	11.7	CWP630	12.7
8"	8.625	CWP812	9.74	CWP810	10.7	CWP815	11.7	CWP820	12.7	CWP825	13.95	CWP830	14.95
10"	10.75	CWP1012	11.87	CWP1010	12.7	CWP1015	13.95	CWP1020	14.95	CWP1025	15.95	CWP1030	16.95
12"	12.75	CWP1212	13.88	CWP1210	14.95	CWP1215	15.95	CWP1220	16.95	CWP1225	17.95	CWP1230	18.95

Model CWT, Copper Tube Sizes, Insulation and Strut Clamps

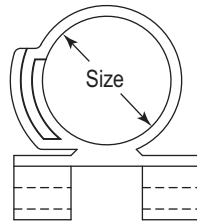
Copper Tube	Tube OD	1/2"		1"		1 1/2"		2"		2 1/2"		3"	
		Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.	Part No.	Insulation O.D.
1/2"	5/8"	CWT5812	1.66	CWT5810	2.82	CWT5815	3.45	-	-	-	-	-	-
3/4"	7/8"	CWT7812	1.92	CWT7810	2.82	CWT7815	3.95	CWT7820	4.95	-	-	-	-
1"	1 1/8"	CWT11812	2.16	CWT11810	2.82	CWT11815	3.95	CWT11820	4.95	-	-	-	-
1 1/4"	1 3/8"	CWT13812	2.41	CWT13810	3.45	CWT13815	4.45	CWT13820	5.51	-	-	-	-
1 1/2"	1 5/8"	CWT15812	2.72	CWT15810	3.45	CWT15815	4.95	CWT15820	5.51	-	-	-	-
2"	2 1/8"	CWT21812	3.16	CWT21810	3.95	CWT21815	4.95	CWT21820	6.57	CWT21825	7.57	CWT21830	8.57
2 1/2"	2 5/8"	CWT25812	3.66	CWT25810	4.45	CWT25815	5.51	CWT25820	6.57	CWT25825	7.57	CWT25830	8.57
3"	3 1/8"	CWT31812	4.16	CWT31810	4.95	CWT31815	6.57	CWT31820	7.57	CWT31825	8.57	CWT31830	9.57
4"	4 1/8"	CWT41812	5.16	CWT41810	6.57	CWT41815	7.57	CWT41820	8.57	CWT41825	9.57	CWT41830	10.7
5"	5 1/8"	CWT51812	6.16	CWT51810	7.57	CWT51815	8.57	CWT51820	9.57	CWT51825	10.7	CWT51830	11.7
6"	6 1/8"	CWT61812	7.16	CWT61810	8.57	CWT61815	9.57	CWT61820	10.7	CWT61825	11.7	CWT61830	12.7

## QUICK-CLIP



Quick-Clip's unique one-piece composite polyamide alloy design combines strength with light weight. It will overcome the problems of using cable ties for piping, electrical, optical and network cabling

- Quick Clip locates easily on 3/8" rod
- No breaks in insulation material
- Fast and easy installation, saves time and money
- Single handed installation
- Manufactured from a composite polyamide, tested from -40°F to + 275°F, makes it ideal for network cables
- Studding panel inserts.



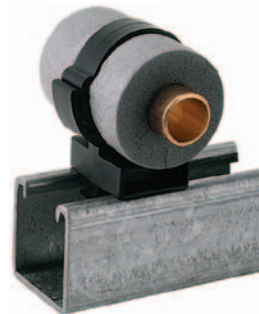
Slide onto threaded rod, twist to engage. Insert pipe and clip to lock.

Part No.	CLAMPING RANGE				Condensate Drain
	Standard Copper	Metric Copper	Copper Tube		
	(no insulation)		with 3/8" Insulation	with 1/2" Insulation	
QC12	3/4"	-	-	-	-
QC14	7/8"	22mm	-	-	yes
QC16	1"	-	1/4" tube	-	-
QC18	1-1/8"	28mm	3/8" tube	-	-
QC20	1-1/4"	-	1/2" tube	1/4" tube	-
QC22	1-3/8"	-	5/8" tube	3/8" tube	yes
QC24	1-1/2"	-	7/8" tube	5/8" tube	-
QC26	1-5/8"	42mm	1-1/8" tube	3/4" tube	yes
QC32	2"	-	-	7/8" tube	-
QC34	2-1/8"	54mm	1-3/8" tube	1-1/8" tube	yes

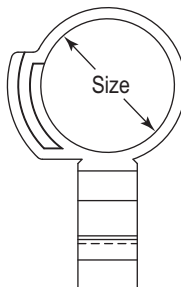
Inside diameter: Certain clips have two or more positions to accommodate both metric and standard sizes

## CUSH-A-CLICK

The great advantage with the **Cush-A-Click** is it retains an unbroken vapor barrier seal, eliminating the problem of sweating on metal fittings. The Cush-A-Click is ideal for the installation of refrigeration systems allowing the barrier seal to run the length of the pipe work without cutting the insulation material. The Cush-A-Click quickly secures both the pipe and the insulation.



- Time and labor savings
- Simple, secure installation of refrigeration and plumbing pipe work
- No break insulation material
- Corrosion resistance
- Light weight



Part No.	CLAMPING RANGE				Condensate Drain
	Standard Copper	Metric Copper	Copper Tube		
	(no insulation)		with 3/8" Insulation	with 1/2" Insulation	
CC12	3/4"	-	-	-	-
CC14	7/8"	22mm	-	-	yes
CC16	1"	-	1/4" tube	-	-
CC18	1-1/8"	28mm	3/8" tube	-	-
CC20	1-1/4"	-	1/2" tube	1/4" tube	-
CC22	1-3/8"	-	5/8" tube	3/8" tube	yes
CC24	1-1/2"	-	7/8" tube	5/8" tube	-
CC26	1-5/8"	42mm	1-1/8" tube	3/4" tube	yes
CC32	2"	-	-	7/8" tube	-
CC34	2-1/8"	54mm	1-3/8" tube	1-1/8" tube	yes

Inside diameter: Certain clips have two or more positions to accommodate both metric and standard sizes

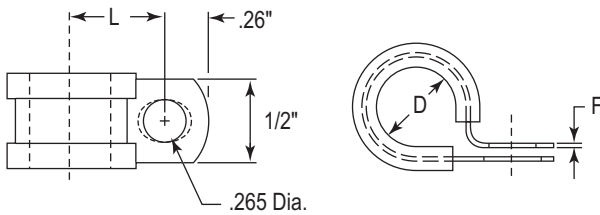
## SPN LOOP CLAMPS

PLATED STEEL LOOP CLAMPS, 1/2" WIDE



**FEATURES:**

- Light to medium duty steel clamp
- E.P.D.M. cushion for electrical insulation and vibration absorption
- Steel clamps are zinc electroplated for corrosion resistance
- Some sizes available in aluminum. Contact factory for details.
- Temperature range -50°F to +275°F



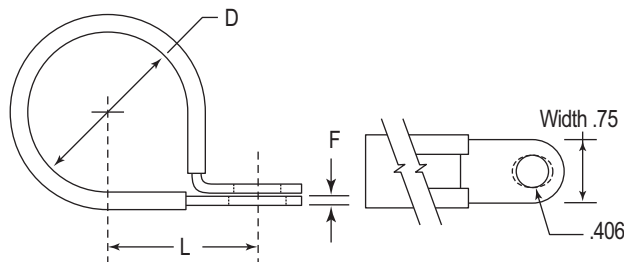
SPN					
Plated Steel Part No.	Stainless Steel Part No.	Size In.	Dimensions (in)		
			D	L	F
SPN-03	SPN-03SS	3/16"	0.188	0.375	0.032
SPN-04	SPN-04SS	1/4"	0.250	0.406	0.032
SPN-05	SPN-05SS	5/16"	0.312	0.438	0.032
SPN-06	SPN-06SS	3/8"	0.375	0.469	0.032
SPN-07	SPN-07SS	7/16"	0.438	0.500	0.032
SPN-08	SPN-08SS	1/2"	0.500	0.531	0.032
SPN-09	SPN-09SS	9/16"	0.562	0.563	0.032
SPN-10	SPN-10SS	5/8"	0.625	0.594	0.032
SPN-11	SPN-11SS	11/16"	0.688	0.625	0.032
SPN-12	SPN-12SS	3/4"	0.750	0.750	0.032
SPN-14	SPN-14SS	7/8"	0.875	0.813	0.032
SPN-16	SPN-16SS	1"	1.000	0.875	0.032
SPN-18	SPN-18SS	1-1/8"	1.125	0.938	0.032
SPN-20	SPN-20SS	1-1/4"	1.250	1.000	0.032
SPN-22	SPN-22SS	1-3/8"	1.375	1.156	0.032
SPN-24	SPN-24SS	1-1/2"	1.500	1.219	0.032
SPN-26	SPN-26SS	1-5/8"	1.625	1.281	0.032
SPN-28	SPN-28SS	1-3/4"	1.750	1.344	0.032
SPN-30	SPN-30SS	1-7/8"	1.875	1.406	0.032
SPN-32	SPN-32SS	2"	2.000	1.469	0.040
SPN-34	SPN-34SS	2-1/8"	2.125	1.531	0.040
SPN-36	SPN-36SS	2-1/4"	2.250	1.630	0.040
SPN-38	SPN-38SS	2-3/8"	2.375	1.690	0.040
SPN-40	SPN-40SS	2-1/2"	2.500	1.719	0.040
SPN-42	SPN-42SS	2-5/8"	2.625	1.810	0.040
SPN-48	SPN-48SS	3"	3.000	1.969	0.040
SPN-52	SPN-52SS	3-1/4"	3.250	2.130	0.040
SPN-56	SPN-56SS	3-1/2"	3.500	2.250	0.040
SPN-64	SPN-64SS	4"	4.000	2.500	0.040

## SPW LOOP CLAMPS

PLATED STEEL 3/4" WIDE

**FEATURES:**

- Light to medium duty steel clamp
- E.P.D.M. cushion for electrical insulation and vibration absorption
- Steel clamps are zinc electroplate for corrosion resistance
- Color - Silver with black durable cushion.
- Temperature range -50°F to +275°F



SPW				
Part No.	Size in	Dimensions (in)		
		D	L	F
SPW-04	1/4"	0.250	0.656	0.031
SPW-06	3/8"	0.375	0.718	0.031
SPW-07	7/16"	0.438	0.730	0.031
SPW-08	1/2"	0.500	0.781	0.031
SPW-09	9/16"	0.563	0.800	0.031
SPW-10	5/8"	0.625	0.843	0.031
SPW-12	3/4"	0.750	0.906	0.031
SPW-14	7/8"	0.875	0.968	0.031
SPW-16	1"	1.000	1.031	0.031
SPW-18	1-1/8"	1.125	1.093	0.050
SPW-20	1-1/4"	1.250	1.140	0.050
SPW-24	1-1/2"	1.500	1.280	0.050
SPW-26	1-5/8"	1.625	1.350	0.050
SPW-28	1-3/4"	1.750	1.410	0.050
SPW-30	1-7/8"	1.875	1.470	0.050
SPW-32	2"	2.000	1.530	0.050
SPW-36	2-1/4"	2.250	1.660	0.050
SPW-40	2-1/2"	2.500	1.780	0.050

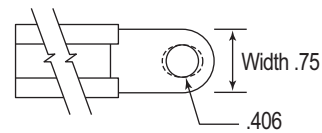
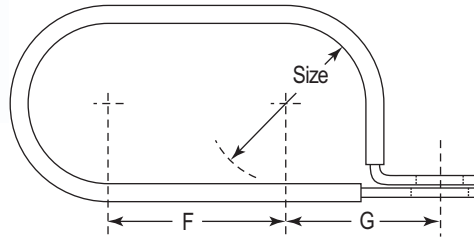
Available in stainless steel. Some sizes available in aluminum. Contact factory for details.

## SPD LOOP CLAMPS

2-TUBE CUSHIONED CABLE CLAMPS, PLATED STEEL 3/4" WIDE

FEATURES:

- Medium duty steel clamp that can be slipped over two tubes or multiple wires and closed with a bolt at assembly.
- Steel clamps are zinc electroplate for corrosion resistance
- E.P.D.M. cushion for electrical insulation and vibration absorption
- Temperature range -50°F to +275°F



SPD			
Part No.	Size In.	Dimensions (in)	
		F	G
SPD-08	1/2"	0.50	0.764
SPD-12	3/4"	0.75	0.889
SPD-16	1"	1.00	1.014
SPD-20	1-1/4"	1.125	1.159

Available in stainless steel. Some sizes available in aluminum. Contact factory for details.

## HVN LOOP CLAMPS

VINYL DIPPED GALVANIZED STEEL 1/2" WIDE



FEATURES:

- Black vinyl plastic coated (PVC)
- Galvanized Steel for corrosion resistance
- Temperature range -25°F to +160°F

## HSN LOOP CLAMPS

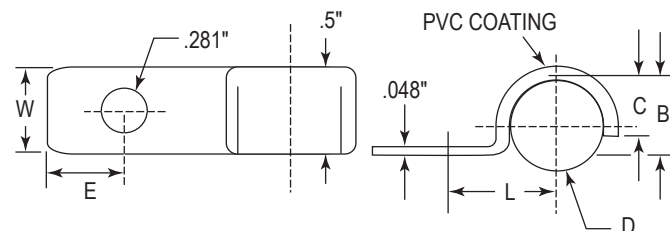
STAINLESS STEEL 1/2" WIDE



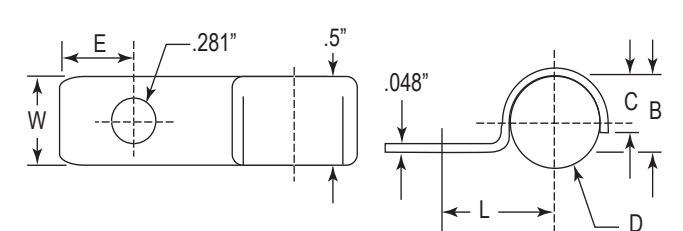
FEATURES:

- Stainless steel, Type 301 or 304

HVN							
Part No.	Size in.	Dimensions (in)					
		D	L	E	B	C	W
HVN-04	1/4"	0.250	0.500	0.250	0.250	0.188	1/2"
HVN-05	5/16"	0.312	0.531	0.312	0.312	0.218	5/8"
HVN-06	3/8"	0.375	0.562	0.312	0.375	0.281	5/8"
HVN-08	1/2"	0.500	0.687	0.312	0.500	0.343	5/8"
HVN-09	9/16"	0.562	0.750	0.312	0.562	0.437	5/8"
HVN-10	5/8"	0.625	0.812	0.312	0.625	0.406	5/8"
HVN-12	3/4"	0.750	0.875	0.312	0.750	0.468	5/8"



HSN Stainless Steel							
Part Number	Size in.	Dimensions (in)					
		D	L	E	B	C	W
HSN-04	1/4"	0.250	0.500	0.250	0.250	0.188	1/2"
HSN-05	5/16"	0.312	0.531	0.312	0.312	0.218	5/8"
HSN-06	3/8"	0.375	0.562	0.312	0.375	0.281	5/8"
HSN-08	1/2"	0.500	0.687	0.312	0.500	0.343	5/8"
HSN-09	9/16"	0.562	0.750	0.312	0.562	0.437	5/8"
HSN-10	5/8"	0.625	0.812	0.312	0.625	0.406	5/8"
HSN-12	3/4"	0.750	0.875	0.312	0.750	0.468	5/8"



## SPH CLAMP

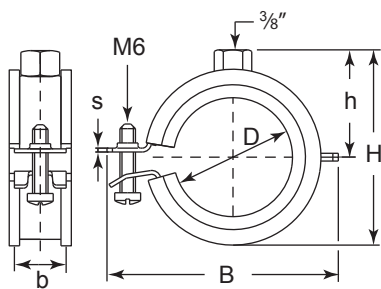
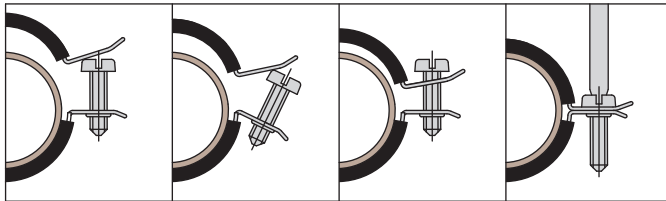
### CUSH-A-RING



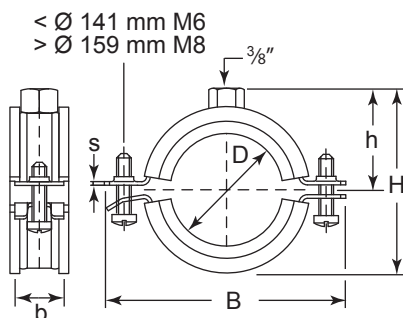
The Cush-A-Ring is a unique rubber lined hanger for copper and steel tube or pipe. The SPH-1 thru SPH-10 is a two-part clamp that has a hinged side with a single screw patented locking system. The quick locking system is easy to close with one hand which makes it easier and faster for installation. The noise insulating rubber lining is made of UV-resistant EPDM rubber. The Cush-A-Ring is zinc plated for corrosion resistance.

#### FEATURES:

- Rubber lined, noise insulated
- With quick locking system
- Clamp easy to close with one hand
- UV-resistant black EPDM rubber lining
- Zinc plated
- ASTM E-84
- Meets - Buy America Act



SPH-1 thru SPH-10



SPH-11 thru SPH-14

SPH							
Part No.	Dimensions (in)						
	D	IP	CT	B	H	h	b x s
SPH-1	11 - 14	1/4"	3/8"	1.9	1.4	0.87	20 x 1.25
SPH-2	15 - 18	3/8"	1/2"	1.9	1.4	0.87	20 x 1.25
SPH-3	20 - 23	1/2"	3/4"	2.2	1.6	0.94	20 x 1.25
SPH-4	25 - 28	3/4"	1	2.4	1.8	1.10	20 x 1.25
SPH-5	31 - 35	1	1-1/4"	2.6	2.0	1.20	20 x 1.25
SPH-6	40 - 43	1-1/4"	1-1/2"	3.0	2.4	1.30	20 x 1.25
SPH-7	48 - 53	1-1/2"	-	3.3	2.6	1.50	20 x 1.50
SPH-8	54 - 56	-	2	3.5	2.8	1.60	20 x 1.50
SPH-9	57 - 63	2	-	3.7	3.1	1.70	20 x 1.50
SPH-10	64-70	-	2 1/2"	4.5	3.9	2.20	23 x 2.00
<b>BELOW PARTS HAVE 2 BOLT CONFIGURATIONS</b>							
SPH-11	73-80	2 1/2"	3	5.0	4.3	2.40	23 x 2.00
SPH-12	83-91	3	-	5.4	4.8	2.60	25 x 2.50
SPH-13	100-105	-	4	6.0	5.3	2.90	25 x 2.50
SPH-14	108-114	4	-	6.3	5.7	3.10	25 x 2.50



## SPP CLAMPS

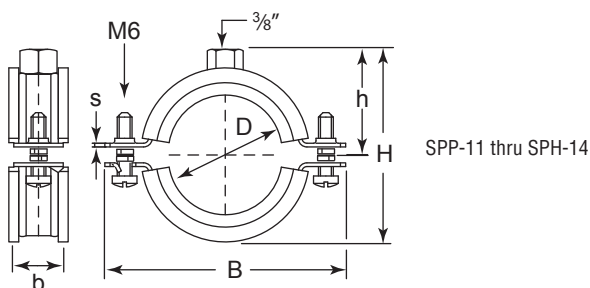
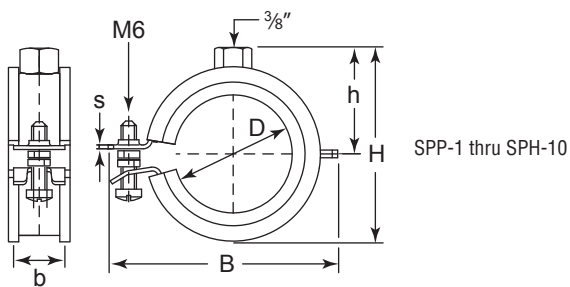
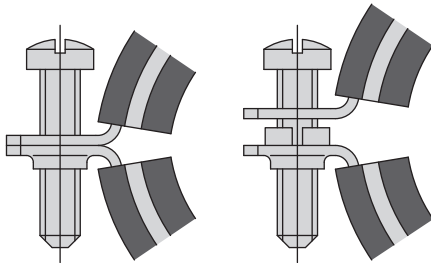
### CUSH-A-RING



The Cush-A-Ring is a unique rubber lined hanger for PEX, CPVC, and PVC pipe. The SPP-1 thru SPP-10 has a two-part clamp with a hinged side and a single screw patented locking system. The quick locking system is easy to close with one hand which makes it easier and faster for installation. The noise insulating rubber lining is made of UV-resistant EPDM rubber. The Cush-A-Ring is zinc plated for corrosion resistance.

#### FEATURES:

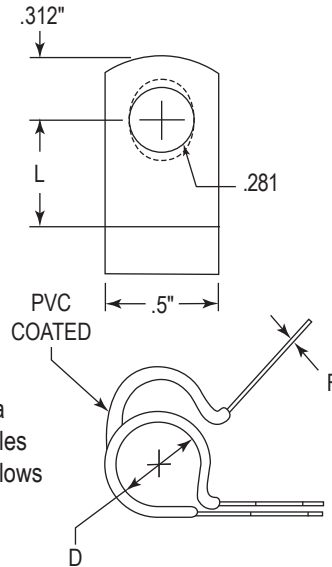
- With quick locking system
- Clamp easy to close with one hand
- Specially formulated, green, UV and age resistant EPDM rubber lining
- Perfect for PEX, Fusion, CPVC and PVC pipe
- ASTM E-84
- Complies with MSS SP-58 and SP-69
- Material steel, zinc plated



SPP							
Part No.	Dimensions (in)						
	D	IP	CT	B	H	h	b x s
SPP-1	15-18	1/4"	3/8"	1.9	1.4	0.87	20 x 1.25
SPP-2	20-23	3/8"	1/2"	2.2	1.7	0.94	20 x 1.25
SPP-3	25-28	1/2"	3/4"	2.4	1.9	1.00	20 x 1.25
SPP-4	31-35	3/4"	1	2.6	2.2	1.20	20 x 1.25
SPP-5	40-43	1	1-1/4"	3.0	2.6	1.30	20 x 1.25
SPP-6	48-53	1-1/4"	1-1/2"	3.3	3.0	1.50	20 x 1.50
SPP-7	54-56	1-1/2"	-	3.5	3.0	1.60	20 x 1.50
SPP-8	60-65	-	2	4.3	3.4	1.70	20 x 1.50
SPP-9	57 - 63	2	-	3.7	3.1	1.70	20 x 1.50
SPP-10	64-70	-	2 1/2"	4.5	3.9	2.20	23 x 2.00
<b>BELOW PARTS HAVE 2 BOLT CONFIGURATIONS</b>							
SPP-11	73-80	2 1/2"	3	5.0	4.3	2.40	23 x 2.00
SPP-12	83-91	3	-	5.4	4.8	2.60	25 x 2.50
SPP-13	100- 105	-	4	6.0	5.3	2.90	25 x 2.50
SPP-14	108-114	4	-	6.3	5.7	3.10	25 x 2.50

## SVN LOOP CLAMPS

VINYL DIPPED - GALVANIZED STEEL 1/2" WIDE



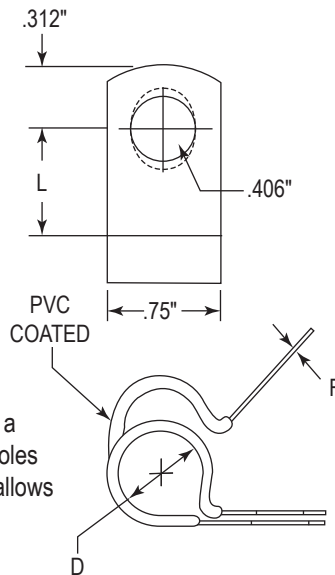
**FEATURES:**

- Medium duty steel clamp that can be slipped over a tube or wire and closed with a bolt at assembly. Holes provide easy alignment. Its pre developed shape allows for proper closing and excellent fit of the clamp.
- Galvanized Steel
- PVC coated, black color
- Temperature range -25°F to +160°F

SVN				
Part No.	Size in.	Dimensions (in)		
		D	L	F
SVN-03	3/16"	0.187	0.500	0.032
SVN-04	1/4"	0.250	0.531	0.032
SVN-05	5/16"	0.312	0.562	0.032
SVN-06	3/8"	0.375	0.593	0.032
SVN-08	1/2"	0.500	0.656	0.048
SVN-09	9/16"	0.562	0.687	0.048
SVN-10	5/8"	0.625	0.718	0.048
SVN-12	3/4"	0.750	0.781	0.048
SVN-14	7/8"	0.875	0.843	0.048
SVN-16	1"	1.000	0.906	0.048
SVN-18	1-1/8"	1.125	0.968	0.048

## SVW LOOP CLAMPS

VINYL DIPPED GALVANIZED STEEL 3/4" WIDE



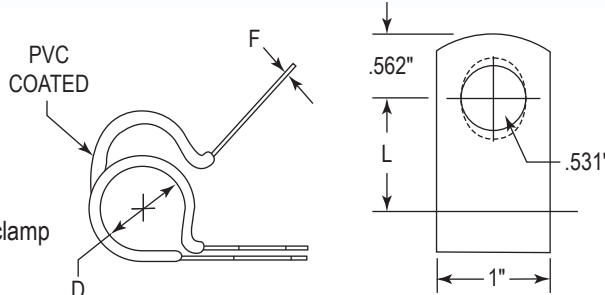
**FEATURES:**

- Medium duty steel clamp that can be slipped over a tube or wire and closed with a bolt at assembly. Holes provide easy alignment. Its pre developed shape allows for proper closing and excellent fit of the clamp..
- Galvanized Steel
- PVC coated, black color
- Temperature range -25°F to +160°F

SVW				
Part No.	Size in.	Dimensions (in)		
		D	L	F
SVW-04	1/4"	0.250	0.656	0.032
SVW-05	5/16"	0.312	0.562	0.032
SVW-06	3/8"	0.375	0.0718	0.032
SVW-08	1/2"	0.500	0.781	0.048
SVW-09	9/16"	0.562	0.812	0.048
SVW-10	5/8"	0.625	0.843	0.048
SVW-12	3/4"	0.750	0.906	0.048
SVW-13	13/16"	0.812	0.937	0.048
SVW-14	7/8"	0.875	0.968	0.048
SVW-15	15/16"	0.937	1.000	0.048
SVW-16	1"	1.000	1.031	0.048
SVW-18	1-1/8"	1.125	1.092	0.048
SVW-20	1-1/4"	1.125	1.156	0.048
SVW-22	1-3/8"	1.375	1.218	0.048

## LVZ LOOP CLAMPS

VINYL DIPPED GALVANIZED STEEL 1" WIDE



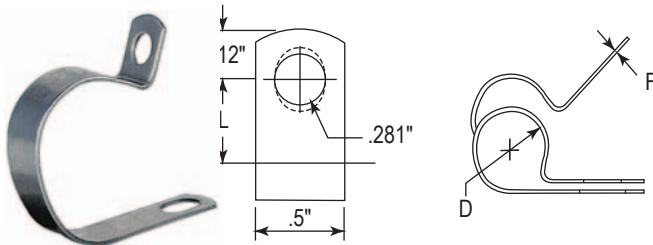
**FEATURES:**

- Heavy duty steel clamp
- Galvanized Steel
- PVC coated, black color
- Temperature range -25°F to +160°F

LVZ				
Part No.	Size in.	Dimensions (in)		
		D	L	F
LVZ-18	1-1/8"	1.13	1.218	0.048
LVZ-19	1-3/16"	1.19	1.250	0.048
LVZ-20	1-1/4"	1.25	1.281	0.048
LVZ-21	1-5/16"	1.31	1.312	0.048
LVZ-24	1-1/2"	1.50	1.406	0.048
LVZ-25	1-9/16"	1.56	1.437	0.048
LVZ-28	1-3/4"	1.75	1.531	0.048
LVZ-29	1-13/16"	1.81	1.562	0.048
LVZ-32	2"	2.00	1.687	0.048
LVZ-33	2-1/16"	2.06	1.718	0.048
LVZ-36	2-1/4"	2.25	1.812	0.048
LVZ-40	2-1/2"	2.50	1.937	0.048
LVZ-42	2-5/8"	2.63	2.000	0.048
LVZ-44	2-3/4"	2.75	2.062	0.048
LVZ-46	2-7/8"	2.88	2.125	0.048
LVZ-57	3-9/16"	3.56	2.437	0.048

## SSN LOOP CLAMPS

STAINLESS STEEL 1/2" WIDE



**FEATURES:**

- Medium duty steel clamp that can be slipped over a tube or wire and closed with a bolt at assembly. Holes provide easy alignment. Its pre-developed shape allows for proper closing and excellent fit.
- Stainless steel, type 301 or 304

SSN stainless steel				
Part No.	Size in.	Dimensions (in)		
		D	L	F
SSN-03	3/16"	0.187	0.500	0.032
SSN-04	1/4"	0.250	0.531	0.032
SSN-05	5/16"	0.312	0.562	0.032
SSN-06	3/8"	0.375	0.593	0.032
SSN-08	1/2"	0.500	0.656	0.048
SSN-09	9/16"	0.562	0.687	0.048
SSN-10	5/8"	0.625	0.718	0.048
SSN-12	3/4"	0.750	0.781	0.048
SSN-14	7/8"	0.875	0.843	0.048
SSN-16	1"	1.000	0.906	0.048
SSN-18	1-1/8"	1.125	0.968	0.048

## CABLE CLAMPS

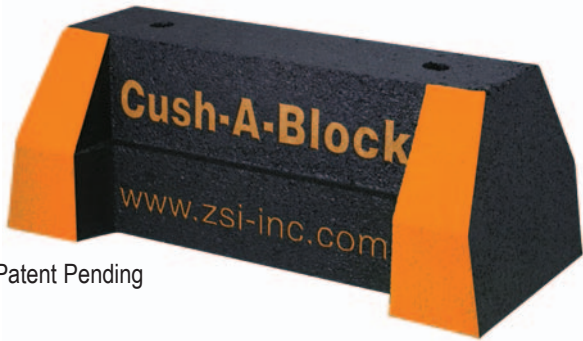
Cable Clamps are perfect for securing wires and cables in the electric, automotive and aircraft industries.



CC UV Black also available upon request Closed Bottom			
Part No.	A (in.)	C (in.)	Screw Dia. (in.)
CC3-1/8	0.130	0.358	0.21
CC3-3/16	0.189	0.358	0.21
CC3-1/4	0.260	0.358	0.21
CC3-5/16	0.307	0.358	0.21
CC3-3/8	0.382	0.362	0.21
CC5-1/8	0.114	0.500	0.21
CC5-1/4	0.232	0.500	0.21
CC5-3/8	0.358	0.500	0.21
CC5-1/2	0.480	0.500	0.21
CC5-9/16	0.543	0.500	0.21
CC5-3/4	0.732	0.500	0.21
CC5-7/8	0.858	0.500	0.21
CC5-1 1/8	0.110	0.500	0.21



## CUSH-A-BLOCK SUPPORTS



Patent Pending



Cush-A-Block features:

- 100% Recycled Rubber
- LEED Certifiable
- Meets the Buy America Act and American Reinvestment Recovery Act (A.R.R.A.)
- Independent Laboratory Tested to the following
  - ASTM D575 Method B – Modified, Compression/Deflection
  - ASTM D1171 Modified – Ozone Resistance
  - Freeze/Thaw Environmental Simulation
- Resistance to Freeze and Thaw
- All 4 Corners coated with reflective safety orange for visibility
- Dampens Vibrations
- Compatible with most rooftop materials

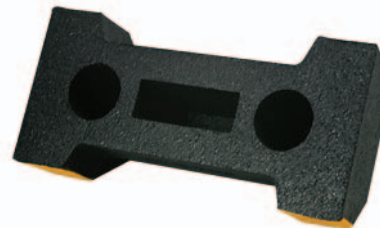
Cush-A-Block support applications:

- Solar Racking
- Pipe & Conduit supports
- HVAC, Duct, Cable Tray supports
- Air Conditioning supports
- Roof Walkway supports

The channel for Cush-A-Block support assemblies includes a variety of options. The strut can be made in special lengths, finishes, and alloys including Aluminum, Stainless Steel both 304 & 316, PVC coated, Powder coated, Zinc Trivalent Chromium, Pre-Galvanized and Hot Dipped Galvanized.

## CUSH-A-BLOCK SUPPORTS

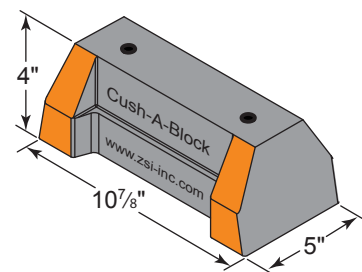
### CBS BASE SERIES



Base Area Shown = 33.1 Sq. In.  
For use in bearing calculations

CBS-Base Series		
Part No.	Weight	Uniform Load Capacity (Lbs) *
CBS	4.80 lbs.	2,500 *

\* This load is only for the capacity of the components in this assembly. Please consult roofing manufacturer or engineer for roof load capacity



## CUSH-A-BLOCK SUPPORTS

CBS SERIES W/METAL CHANNEL

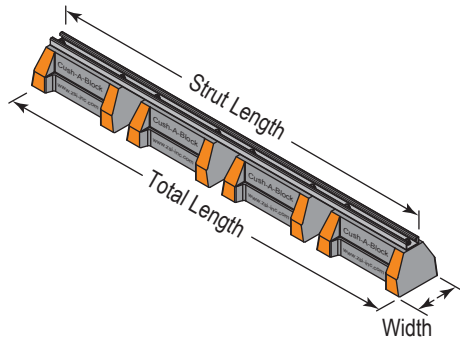
Standard strut mount pipe clamps are used to secure the pipes.



Note: Roof supports come pre-assembled



CBS2RD shown with two bases



The CBS Series provides a longer mounting surface with strut lengths up to 46<sup>3</sup>/<sub>8</sub>"

CBS-Support With <sup>13</sup> / <sub>16</sub> " Pre-Galv. Steel Channel						
	Part No.	No. of Bases	Strut Length	Total Length	Weight (Lbs)	Uniform Load Capacity (Lbs) *
	CBS1S	1	9.312"	10-7/8"	5.62	2,500 *
	CBS2S	2	22.375"	24"	11.56	5,000 *
	CBS3S	3	34.375"	36"	17.41	7,500 *
	CBS4S	4	46.375"	48"	23.25	10,000 *
CBS-Support With <sup>15</sup> / <sub>8</sub> " Pre-Galv. Steel Channel						
	CBS1D	1	9.312"	10-7/8"	6.26	2,500 *
	CBS2D	2	22.375"	24"	13.10	5,000 *
	CBS3D	3	34.375"	36"	19.77	7,500 *
	CBS4D	4	46.375"	48"	26.44	10,000 *
CBS Support With <sup>27</sup> / <sub>16</sub> " Pre-Galv. Steel Channel						
	CBS1RD	1	9.312"	10-7/8"	6.69	2,500 *
	CBS2RD	2	22.375"	24"	14.13	5,000 *
	CBS3RD	3	34.375"	36"	21.35	7,500 *
	CBS4RD	4	46.375"	48"	28.58	10,000 *

\* This load is only for the capacity of the components in this assembly. Please consult roofing manufacturer or engineer for roof load capacity

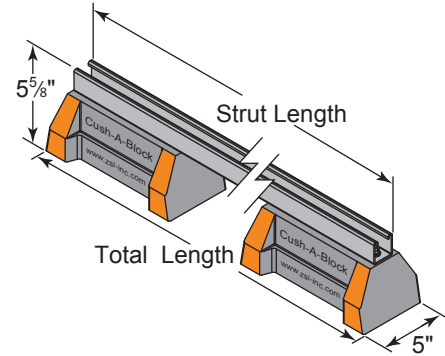
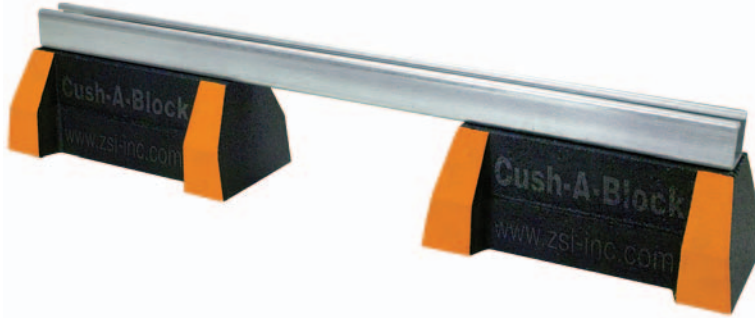


## CUSH-A-BLOCK SUPPORTS

CBS-BR BRIDGE SERIES WITH CHANNEL

Standard strut mount pipe clamps are used to secure the pipes.

Note: Roof supports come pre-assembled



CBS-CB-Bridge Series - Bridge Length Supports With 2 CBS Bases and Channel				
Part No.	Strut Length	Total Length	Weight (Lbs)	Uniform Load Capacity (Lbs) *
CBS28BR	28"	29-3/4"	13.96	1,491*
CBS36BR	36"	37-3/4"	15.18	1,160*
CBS42BR	42"	43-3/4"	16.09	994*
CBS50BR	50"	51-3/4"	17.31	835*
CBS60BR	60"	61-3/4"	18.84	696*

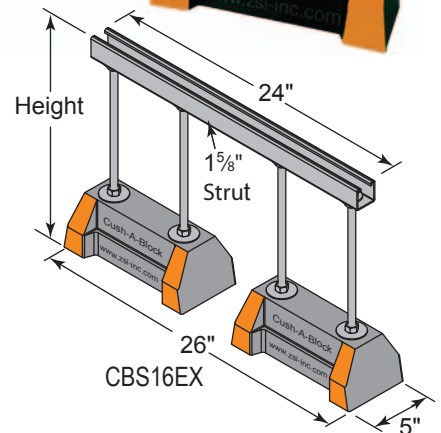
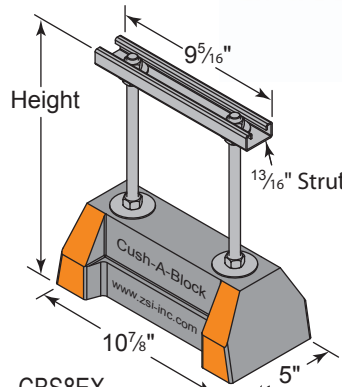
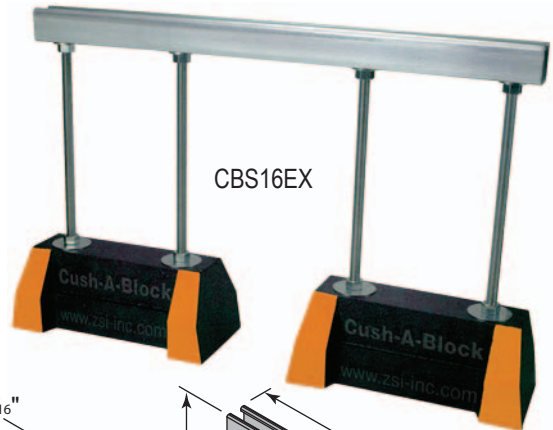
\* This load is only for the capacity of the components in this assembly. Please consult roofing manufacturer or engineer for roof load capacity

## CUSH-A-BLOCK SUPPORTS

CBS-CE SERIES WITH RAISED CHANNEL

Standard strut mount pipe clamps are used to secure the pipes.

Note: Roof supports come pre-assembled



CBS-EX-Extension Series Support With Threaded Rod Extension and Channel			
Part No.	Height	Weight (Lbs)	Uniform Load Capacity (Lbs) *
CBS8EX	8"	6.89	1,000 *
CBS12EX	12"	7.34	1,000 *
CBS16EX	16"	15.85	2,000 *

\* This load is only for the capacity of the components in this assembly. Please consult roofing manufacturer or engineer for roof load capacity

CBS8EX,  
CBS12EX

CBS16EX

## CUSH-A-BLOCK SUPPORTS

CBS-RB SERIES WITH RAISED BRIDGE MEDIUM SUPPORT



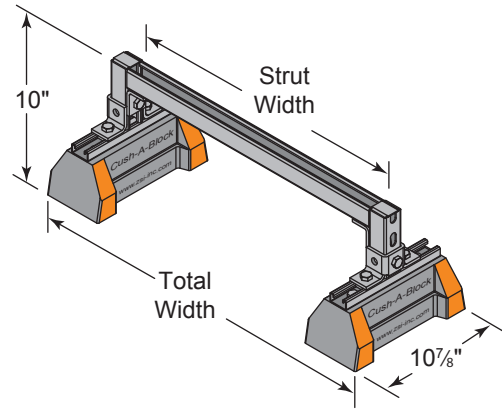
Standard strut mount pipe clamps are used to secure the pipes.



Note: Roof supports come pre-assembled

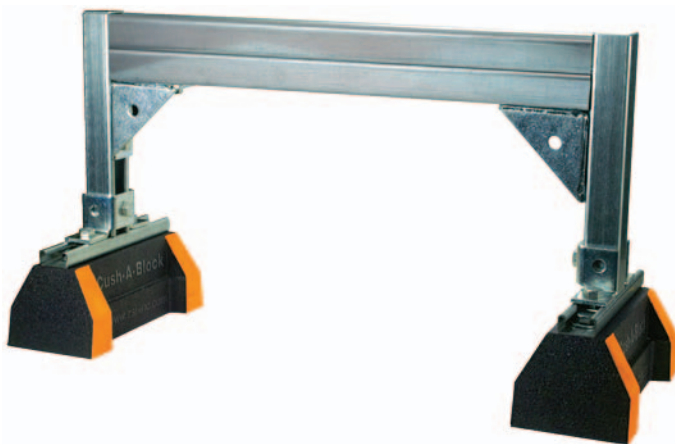
Raised Bridge Length With 2 CBS Bases 1-5/8" Pre-Galv Steel Channel					
Part No.	Base Width	Strut Width	Base Length	Weight (Lbs)	Uniform Load Capacity (Lbs) *
CBS1RB	18-5/8"	12"	10-7/8"	19.4	3,000 *
CBS2RB	30-5/8"	24"		21.9	1,500 *

\* This load is only for the capacity of the components in this assembly. Please consult roofing manufacturer or engineer for roof load capacity



## CUSH-A-BLOCK SUPPORTS

CBS-RB SERIES WITH RAISED CHANNEL HEAVY SUPPORT



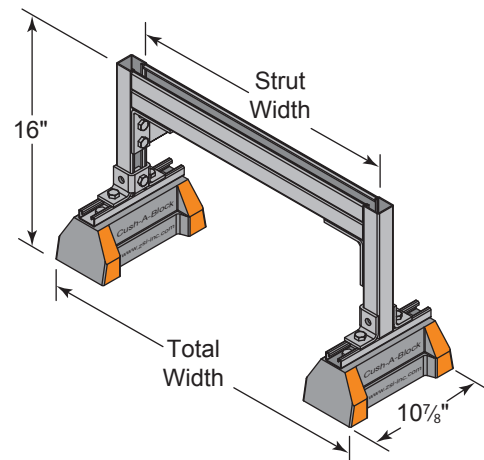
Standard strut mount pipe clamps are used to secure the pipes.



Note: Roof supports come pre-assembled

Raised Bridge Length With 2 CBS Bases 3-1/4" Back-to-Back Pre-Galv Steel Channel				
Part No.	Base Width	Strut Width	Weight (Lbs)	Uniform Load Capacity (Lbs) *
CBS3RB	30-5/8"	24"	30.8	3,500 *
CBS4RB	42-5/8"	36"	34.3	3,250 *

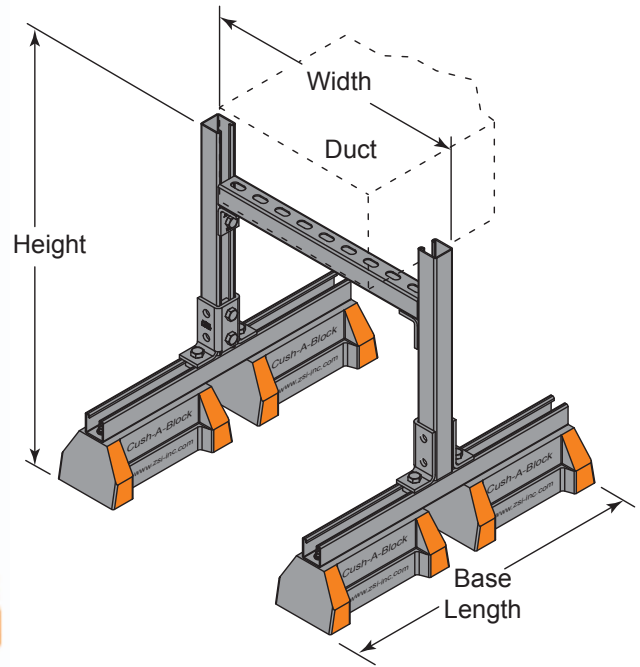
\* This load is only for the capacity of the components in this assembly. Please consult roofing manufacturer or engineer for roof load capacity





## CUSH-A-BLOCK SUPPORTS

CBS-DSFW SERIES, FIXED WIDTH  
DUCT SUPPORT



CBS-DSF Duct Support Series With Fixed Width

Model No.	Height	Width	Base Length	No. of Bases	Weight (Lbs)	Uniform Load Capacity (Lbs) *
CBS1-DSFW	23"	18"	24"	4	39.80	2042 *
CBS2-DSFW		24"			40.67	1531 *
CBS3-DSFW		36"			42.33	1021 *
CBS4-DSFW		48"			43.99	766 *
CBS5-DSFW	29"	18"	24"	4	41.58	2042 *
CBS6-DSFW		24"			42.41	1531 *
CBS7-DSFW		36"			44.08	1021 *
CBS8-DSFW		48"			45.74	766 *
CBS9-DSFW	41"	18"	24"	4	45.07	2042 *
CBS10-DSFW		24"			45.90	1531 *
CBS11-DSFW		36"			47.56	1021 *
CBS12-DSFW		48"			49.22	766 *
CBS13-DSFW	53"	18"	36"	6	62.23	2042 *
CBS14-DSFW		24"			63.06	1531 *
CBS15-DSFW		36"			64.72	1021 *
CBS16-DSFW		48"			66.38	766 *

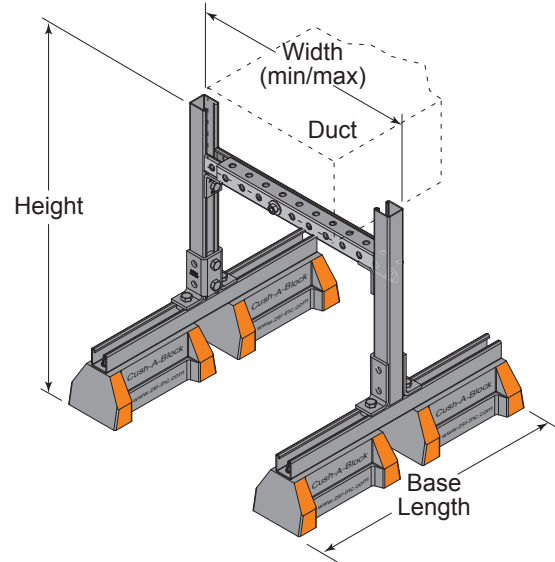
\* This load is only for the capacity of the components in this assembly.  
Please consult roofing manufacturer or engineer for roof load capacity





## CUSH-A-BLOCK SUPPORTS

CBS-DS SERIES, ADJUSTABLE WIDTH DUCT SUPPORT



CBS-DS-Duct Support Series With Adjustable Width and Height							
Part No.	Width		Height	Base Length	Total Bases	Weight (Lbs)	Uniform Load at Min. Width(Lbs) *
	Min.	Max.					
CBS1DS	19- <sup>1</sup> / <sub>4</sub> "	26- <sup>3</sup> / <sub>4</sub> "	28.813"	10- <sup>7</sup> / <sub>8</sub> " (276mm)	2	29.61	1,909 *
CBS2DS	24- <sup>7</sup> / <sub>8</sub> "	39- <sup>7</sup> / <sub>8</sub> "				31.19	1,477 *
CBS3DS	38"	62- <sup>3</sup> / <sub>8</sub> "		24" (610mm)	4	46.47	967 *
CBS4DS	62- <sup>3</sup> / <sub>8</sub> "	103- <sup>5</sup> / <sub>8</sub> "		36" (914mm)	6	66.90	589 *
CBS5DS	19- <sup>1</sup> / <sub>4</sub> "	26- <sup>3</sup> / <sub>4</sub> "	36"	10- <sup>7</sup> / <sub>8</sub> " (276mm)	2	30.61	1,909 *
CBS6DS	24- <sup>7</sup> / <sub>8</sub> "	39- <sup>7</sup> / <sub>8</sub> "				32.19	1,477 *
CBS7DS	38"	62- <sup>3</sup> / <sub>8</sub> "		24" (610mm)	4	47.47	967 *
CBS8DS	62- <sup>3</sup> / <sub>8</sub> "	103- <sup>5</sup> / <sub>8</sub> "		36" (914mm)	6	67.90	589 *

The CBS-DS Series is designed specifically for ductwork support. The telescopic cross beam provides easy size adjustments.

Standard strut mount pipe clamps are used to secure the pipes.

Note: Roof supports come pre-assembled

\* This load is only for the capacity of the components in this assembly. Please consult roofing manufacturer or engineer for roof load capacity

## CUSH-A-BLOCK SUPPORTS

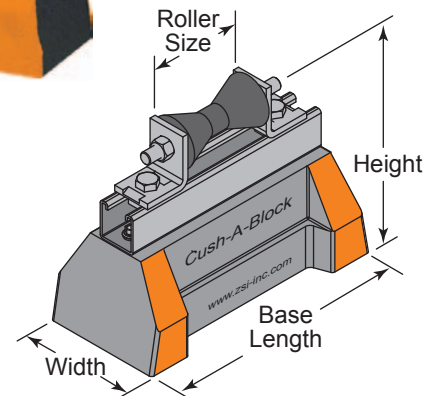
CBS-PRB SERIES, WITH PIPE ROLLER



Note: Roof supports come pre-assembled

CBS-R-Roller-Series With 1- <sup>5</sup> / <sub>8</sub> " Pre-Galv. Steel Channel With Rollers							
Part No.	Pipe Size (O.D.)	Height	Overall Height to Roller Center	Base Length	No. of Bases	Weight (Lbs)	Uniform Load Capacity (Lbs) *
CBS1PRB	1" to 2"	8"	7"	10- <sup>7</sup> / <sub>8</sub> "	1	9.13	2,500 *
CBS2PRB	2" to 3- <sup>1</sup> / <sub>2</sub> "				1	8.94	2,500 *
CBS3PRB	4" to 6"	8- <sup>1</sup> / <sub>8</sub> "	1		9.37	2,500 *	
CBS4PRB	8" to 10"	10- <sup>5</sup> / <sub>16</sub> "	8- <sup>1</sup> / <sub>4</sub> "	24"	2	21.26	2,500 *

\* This load is only for the capacity of the components in this assembly. Please consult roofing manufacturer or engineer for roof load capacity



## PYTHON SERIES

**STRONG:** Load is applied at right angles to ensure tight fit. Python hose clamps keep their grip on the hose and can be reused. Rolled up band edges ensure a smooth transition between band and hose. Hexagonal screw head with drive slot makes for easy accessibility.



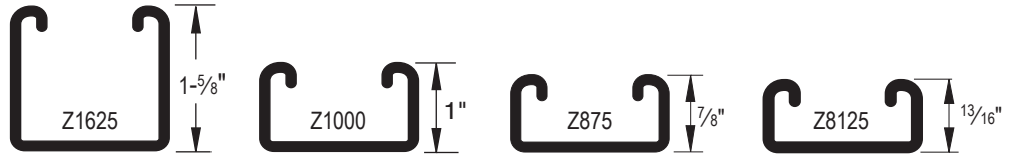
The **Python II** provides greater clamping force with less trouble than heavy-duty T-Bolt type clamps.

- Lower cost than T-Bolts with superb performance.
- Thicker band for greater tensile strength.
- Greater clamping range than T-Bolt 1½" clamping range over 2" diameter
- Zinc plated or 304, 316, or 430 stainless steel
- Non perforated band with embossed threads safely seals without cutting the hose.



Python – Zinc Plated, or Stainless Steel Type 304				
Zinc Plated Part No.	Stainless Steel Part No.	SAE Size	Clamping Range	
			in.	mm
PY-03	PY-30	3	5/16 - 9/16	8-14
PY-04	PY-40S	4	7/16 - 11/16	11-17
PY-06	PY-60	6	1/2 - 13/16	13-20
PY-08	PY-80S	8	5/8 - 15/16	15-24
PY-10	PY-100	10	3/4 - 1-1/8	19-28
PY-12	PY-120	12	7/8 - 1-1/4	22-32
PY-16	PY-160	16	1-1/16 - 1-1/2	26-38
PY-20	PY-200	20	1-1/4 - 1-3/4	32-44
PY-24	PY-240	24	1-1/2 - 2	38-50
PY-28	PY-280	28	1-3/4 - 2-1/4	44-56
PY-32	PY-320	32	2 - 2-9/16	50-65
PY-40	PY-400	40	2-5/16 - 3	58-75
PY-44	PY-440	44	2-11/16 - 3-3/8	68-85
PY-52	PY-520	52	3 - 3-3/4	77-95
PY-64	PY-640	64	3-7/16 - 4-7/16	87-112
PY-80	PY-800	80	4-1/8 - 5-7/16	104-138
PY-96	PY-960	96	5-1/8 - 6-1/2	130-165
PY-104	PY-1040	104	5-7/8 - 7-1/8	150-180
PY-122	PY-1220	122	6-7/8 - 8-1/8	175-205
PY-138	PY-1380	138	7-7/8 - 9-1/8	200-231
PY-154	PY-1540	154	8-7/8 - 10-1/16	226-256
PY-170	PY-1700	170	9-7/8 - 11-1/8	251-282
PY-186	PY-1860	186	10-7/8 - 12-1/8	277-307

PYTHON II – Stainless Steel Type 316		
Part No.	Clamping Range	
	in.	mm
PY-331	5/16 - 9/16	8 -14
PY-431	7/16 - 11/16	11-17
PY-631	1/2 - 13/16	13-20
PY-831	5/8 - 15/16	15-24
PY-1031	3/4 - 1-1/8	19-28
PY-1231	7/8 - 1-1/4	22-32
PY-1631	1-1/16 - 1-1/2	26-38
PY-2031	1-1/4 - 1-3/4	32-44
PY-2431	1-1/2 - 2	38-50
PY-2831	1-1/4 - 2-1/4	32-57
PY-3231	1/2 - 2-1/2	38-64
PY-3631	1-3/4 - 2-3/4	44-70
PY-4031	2 - 3	51-76
PY-4431	2-1/4 - 3-1/4	57-83
PY-4831	2-1/2 - 3-1/2	64-89
PY-5231	2-3/4 - 3-3/4	70-95
PY-5631	3 - 4	76-102
PY-6031	3-1/4 - 4-1/4	83-108
PY-6431	3-1/2 - 4-1/2	89-114
PY-7231	3-1/2 - 5	89 -127
PY-8031	4 - 5-1/2	102-140
PY-8831	4 - 1/2-6	114-152
PY-9631	5 - 6-1/2	127-165
PY-10431	5-1/2 - 7	140-178
PY-11231	6 - 7-1/2	152-191
PY-12031	6-1/2 - 8	165-203
PY-12831	7 - 8-1/2	178-216
PY-13831	7-5/8 - 9-1/8	194-232
PY-15431	8-5/8 - 10-1/8	219-257
PY-17031	9-5/8 - 11-1/8	244-283
PY-18631	10-5/8 - 12-1/8	270-308



All Z-Strut is 1-5/8" Wide, With 7/8" opening

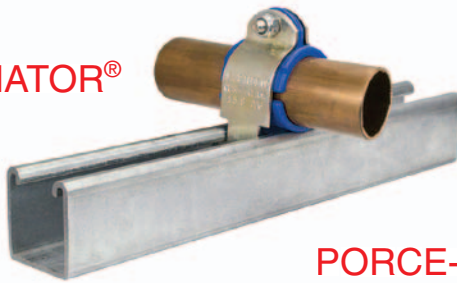
## STRUT PRODUCTS

ZSi offers a line of standard strut channel and a variety of clamps tailored for use with strut. Cush-A-Clamp®, Cush-A-Therm™, and Porce-A-Clamp™ provide cushioned clamping solutions.

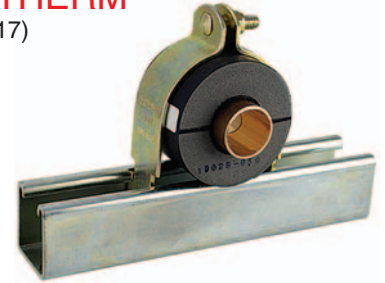
Complementing products are offered for quick connection of pipe, tube and hose to strut.

ZSi's family of cushioned clamps presented earlier in the catalog offer solutions for isolation of the pipes from vibration or thermal transfers. And, "fire retardant" and "fire retardant, halogen free" options are available.

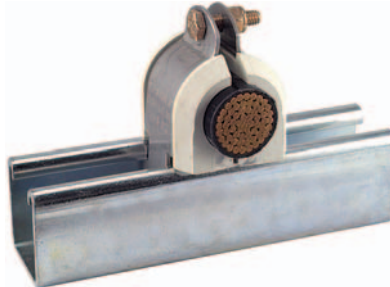
**CUSH-A-NATOR®**  
(See Page 6-7)



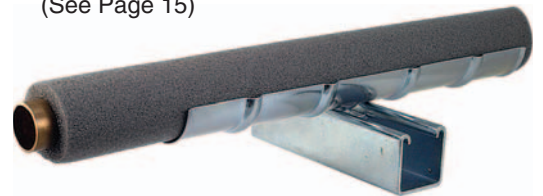
**CUSH-A-THERM™**  
(See Page 16-17)



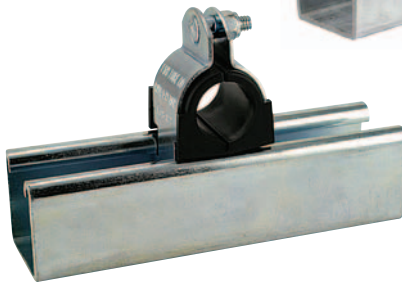
**PORCE-A-CLAMP™**  
(See Page 14)



**SADDLE-UP**  
(See Page 15)



**CUSH-A-CLAMP®**  
(See Page 8)



ZSi's family of non-metallic strut clamps allow quick and easy attachment of pipe, tube, and hose to Z-Strut support channels and are corrosion resistant. They are all a great and cost effective alternative to metallic clamps.

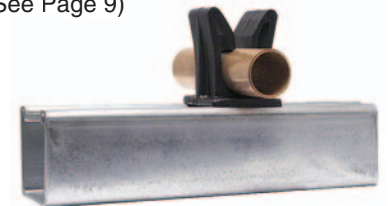
**CUSH-A-CLIP**  
(See Page 10)



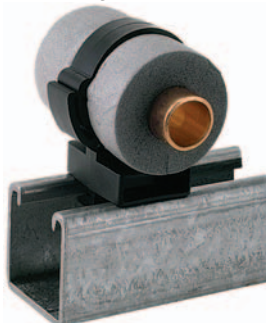
**QUICK-CLIP**  
(See Page 21)



**CUSH-A-CLAW**  
(See Page 9)



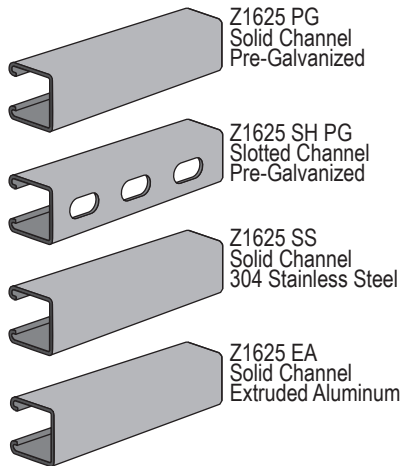
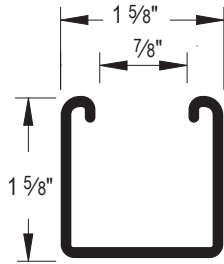
**CUSH-A-CLICK**  
(See Page 21)



**CUSH-A-GRIP**  
(See Page 10)



## Z1625 SERIES



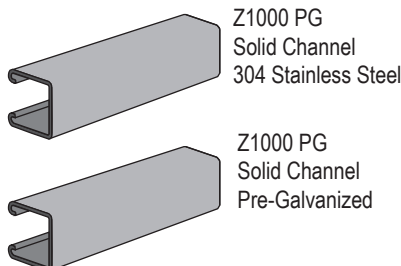
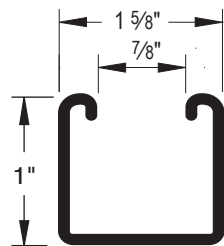
### Z1625 - 1<sup>5</sup>/<sub>8</sub>" x 1<sup>5</sup>/<sub>8</sub>" Channel, 12 Ga.

Solid Channel			Slotted Channel	Length	Steel Channel Wt. Each	Aluminum Channel Wt. Each
Pre-galvanized Part No.	Stainless Steel Type 304 Part No.	Extruded Aluminum Part No.	Pre-galvanized Part No.			
Z1625-06PG	Z1625-06SS	Z1625-06EA	Z1625SH-06PG	0' - 6"	0.95	0.38
Z1625-12PG	Z1625-12SS	Z1625-12EA	Z1625SH-12PG	1' - 0"	1.90	0.76
Z1625-18PG	Z1625-18SS	Z1625-18EA	Z1625SH-18PG	1' - 6"	3.04	1.22
Z1625-24PG	Z1625-24SS	Z1625-24EA	Z1625SH-24PG	2' - 0"	3.80	1.52
Z1625-30PG	Z1625-30SS	Z1625-30EA	Z1625SH-30PG	2' - 6"	4.94	1.98
Z1625-36PG	Z1625-36SS	Z1625-36EA	Z1625SH-36PG	3' - 0"	5.70	2.28
Z1625-42PG	Z1625-42SS	Z1625-42EA	Z1625SH-42PG	3' - 6"	6.84	2.74
Z1625-48PG	Z1625-48SS	Z1625-48EA	Z1625SH-48PG	4' - 0"	7.60	3.04
Z1625-54PG	Z1625-54SS	Z1625-54EA	Z1625SH-54PG	4' - 6"	8.74	3.50
Z1625-60PG	Z1625-60SS	Z1625-60EA	Z1625SH-60PG	5' - 0"	9.50	3.80

#### MATERIAL/FINISH

- Pre-galvanized – Steel conforming to ASTM A653 GR 33.
- Stainless Steel - Type 304 Stainless Steel conforming to ASTM A 240 (Type 304)
- Aluminum - Extruded Aluminum conforming to ASTM B221 (Type 6063-T6)

## Z1000 SERIES



### Z1000 - 1<sup>5</sup>/<sub>8</sub>" x 1" Channel, 12 Ga.

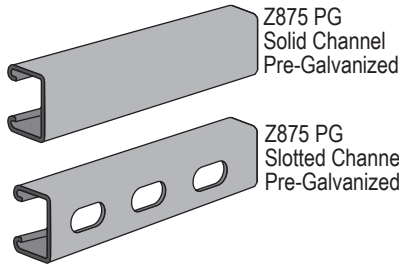
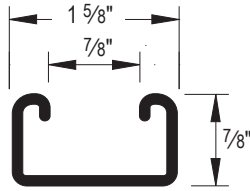
#### Solid Channel

Pre-galvanized Part No.	Stainless Steel Type 304 Part No.	Length	Weight
Z1000-06PG	Z1000-06SS	0' - 6"	0.70
Z1000-12PG	Z1000-12SS	1' - 0"	1.40
Z1000-18PG	Z1000-18SS	1' - 6"	2.24
Z1000-24PG	Z1000-24SS	2' - 0"	2.80
Z1000-30PG	Z1000-30SS	2' - 6"	3.64
Z1000-36PG	Z1000-36SS	3' - 0"	4.20
Z1000-42PG	Z1000-42SS	3' - 6"	5.04
Z1000-48PG	Z1000-48SS	4' - 0"	5.60
Z1000-54PG	Z1000-54SS	4' - 6"	6.44
Z1000-60PG	Z1000-60SS	5' - 0"	7.00

#### MATERIAL/FINISH

- Pre-galvanized – Steel conforming to ASTM A653 GR 33.
- Stainless Steel - Type 304 Stainless Steel conforming to ASTM A 240 (Type 304)

## Z875 SERIES



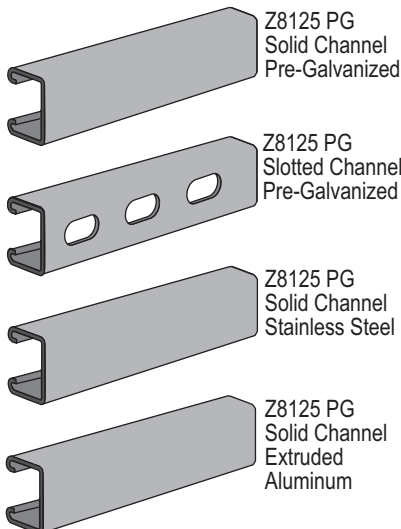
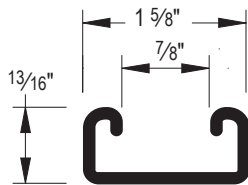
### Z875 - 1<sup>5</sup>/<sub>8</sub>" x 7<sup>7</sup>/<sub>8</sub>" Channel, 12 Ga.

Solid Channel		Slotted Channel	Length	Wt. Each
Pre-galvanized Part No.	Stainless Steel Part No.	Pre-galvanized Part No.		
Z875-06PG		Z875SH-06PG	0' - 6"	0.68
Z875-12PG		Z875SH-12PG	1' - 0"	1.35
Z875-18PG		Z875SH-18PG	1' - 6"	2.16
Z875-24PG		Z875SH-24PG	2' - 0"	2.70
Z875-30PG		Z875SH-30PG	2' - 6"	3.51
Z875-36PG		Z875SH-36PG	3' - 0"	4.05
Z875-42PG		Z875SH-42PG	3' - 6"	4.86
Z875-48PG		Z875SH-48PG	4' - 0"	5.40
Z875-54PG		Z875SH-54PG	4' - 6"	6.21
Z875-60PG		Z875SH-60PG	5' - 0"	6.75

#### MATERIAL/FINISH

- Pre-galvanized – Steel conforming to ASTM A653 GR 33.
- Stainless Steel - Type 304 Stainless Steel conforming to ASTM A 240 (Type 304)
- Aluminum - Extruded Aluminum conforming to ASTM B221 (Type 6063-T6)

## Z8125 SERIES



### Z8125 - 1<sup>5</sup>/<sub>8</sub>" x 1<sup>3</sup>/<sub>16</sub>" Channel, 14 Ga.

Solid Channel			Slotted Channel	Length	Steel Channel Wt. Each	Aluminum Channel Wt. Each
Pre-galvanized Part No.	Stainless Steel Type 304 Part No.	Extruded Aluminum Part No.	Pre-galvanized Part No.			
Z8125-06PG	Z8125-06SS	Z8125-06EA	Z8125SH-06PG	0' - 6"	0.49	0.23
Z8125-12PG	Z8125-12SS	Z8125-12EA	Z8125SH-12PG	1' - 0"	0.97	0.45
Z8125-18PG	Z8125-18SS	Z8125-18EA	Z8125SH-18PG	1' - 6"	1.55	0.72
Z8125-24PG	Z8125-24SS	Z8125-24EA	Z8125SH-24PG	2' - 0"	1.94	0.90
Z8125-30PG	Z8125-30SS	Z8125-30EA	Z8125SH-30PG	2' - 6"	2.52	1.17
Z8125-36PG	Z8125-36SS	Z8125-36EA	Z8125SH-36PG	3' - 0"	2.91	1.35
Z8125-42PG	Z8125-42SS	Z8125-42EA	Z8125SH-42PG	3' - 6"	3.49	1.62
Z8125-48PG	Z8125-48SS	Z8125-48EA	Z8125SH-48PG	4' - 0"	3.88	1.80
Z8125-54PG	Z8125-54SS	Z8125-54EA	Z8125SH-54PG	4' - 6"	4.46	2.07
Z8125-60PG	Z8125-60SS	Z8125-60EA	Z8125SH-60PG	5' - 0"	4.85	2.25

#### MATERIAL/FINISH

- Pre-galvanized – Steel conforming to ASTM A653 GR 33.
- Stainless Steel - Type 304 Stainless Steel conforming to ASTM A 240 (Type 304)
- Aluminum - Extruded Aluminum conforming to ASTM B221 (Type 6063-T6)



**Beta Clamps** are ideal for clamping pipe, tube, hose, and electric cables. They are an economical and easy way of securing them in all types of terrestrial, marine, O.E.M. and Industrial applications. Thanks to the advanced features and the breadth and depth of our product offering, Beta Clamps are used in all areas of industrial, mobile and marine hydraulics, general industrial pipe construction, the field of press technology, instrumentation and control technology and many more.

- Beta Clamps offer shock-absorption, vibration dampening and noise reducing properties.
- Beta Clamps feature a practical and economical design which make for quick, easy pipe installation and layout.
- Using weldable plates, it's easy to anchor the clamps to machinery and steel work.
- Fast, safe, economic installation and service in piping system.
- Upper and lower clamp half are identical.
- Ribs in clamp bore are designed to absorb shock and vibration in the direction of the tube axis.
- Due to their design the clamps can be easily cleaned.

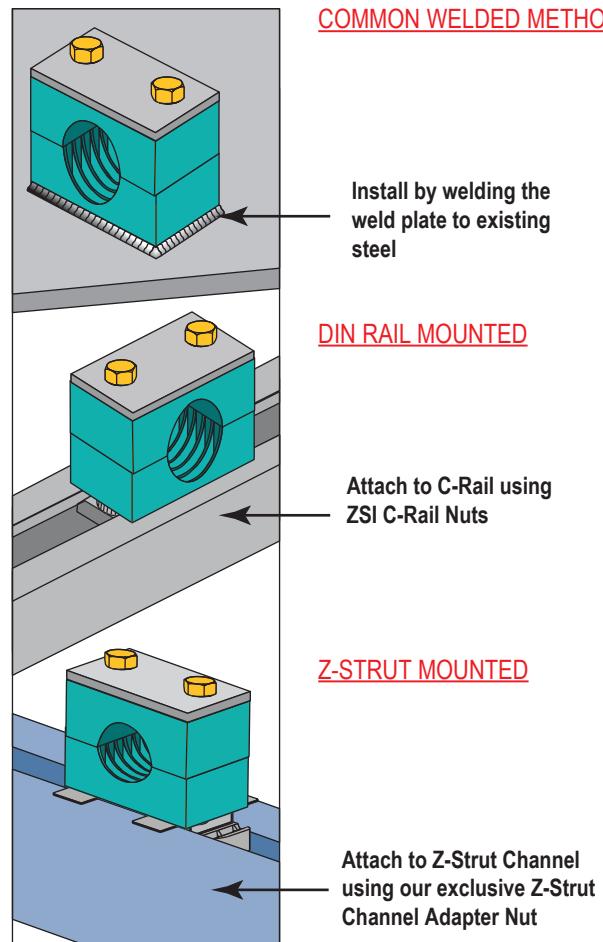
#### CLAMP BODY

- Standard – Polypropylene (Green Color)  
-22°F to 194°F ( -30°C to +90°C)
- Aluminum is available for use in high heat applications

**CLAMP COMPONENTS** – The other metallic components of the clamps are manufactured in:

- Lower and upper plates: steel, stainless steel type 304
- Screw bolts: steel, S40C, stainless steel type 304
- Other metallic on request.

ZSi offers an installation option for all of your application needs.

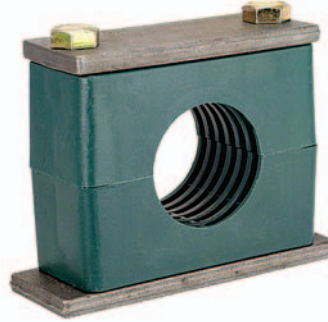


## BETA STANDARD (Pages 40-41)



- For standard hydraulics and systems with less than 1500 PSI without dynamic loads
- Polypropylene cushion
- Steel components

## BETA HEAVY (Pages 42-43)



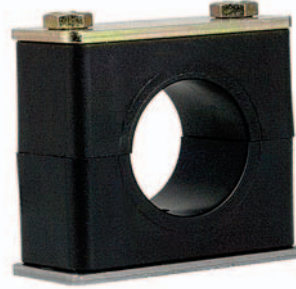
- For systems with greater than 1500 PSI operating pressure, operations with pressure surges, and applications with wide temperature fluctuations.
- Absorbs high levels of shock, noise, and vibration
- Polypropylene cushion & steel components

## BETA TWIN (Pages 44-45)



- For standard hydraulics, general pipe construction and electrical cables
- Polypropylene cushion
- Steel components

## BETA SMOOTHIE (Page 46)



- Reduces wear on hose connection caused by vibration and surge.
- Chamfered and smooth core protects hose cover and extends hose life.
- Uses Beta Standard hardware
- Polypropylene cushion
- Steel components

## BETA SMOOTHIE TWIN (Page 46)



- Reduces wear on hose connection caused by vibration and surge.
- Chamfered and smooth core protects hose cover and extends hose life.
- Uses Beta Twin hardware
- Polypropylene cushion
- Steel components

## BETA SPECIAL METALS (Pages 40-45) (ALUMINUM, STAINLESS STEEL)



- Aluminum cushions with steel components are used in high heat applications up to 500°F
- Stainless steel clamp hardware with polypropylene cushion are used in applications where external corrosion is a concern.

## BETA RUBBER INSERTS (Pages 47-48)



- Available in standard and heavy
- One cushion block provides flexible size range of cushioning.
- Smooth bore core can be used on hose, or for vibration reduction

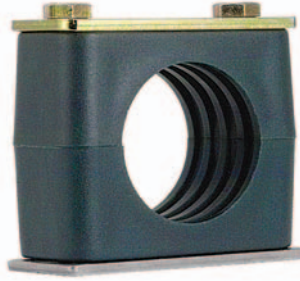
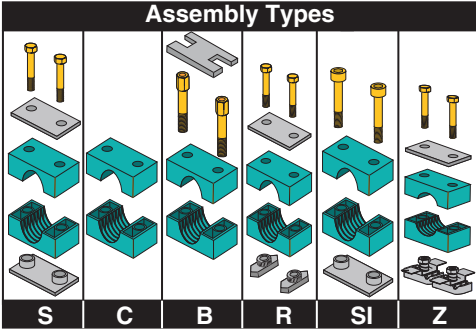
## BETA ADAPTER (Page 49)



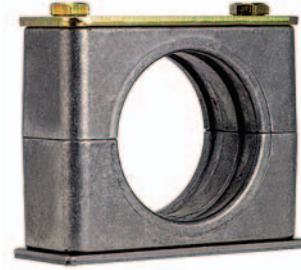
- Allows a clamping junction to be inserted into hydraulic lines.
- The adapter body is offered in two sizes for use with the Z-Clamp adapter inserts.

## BETA CLAMPS

### STANDARD SERIES



Steel w/  
Polypropylene  
Cushion

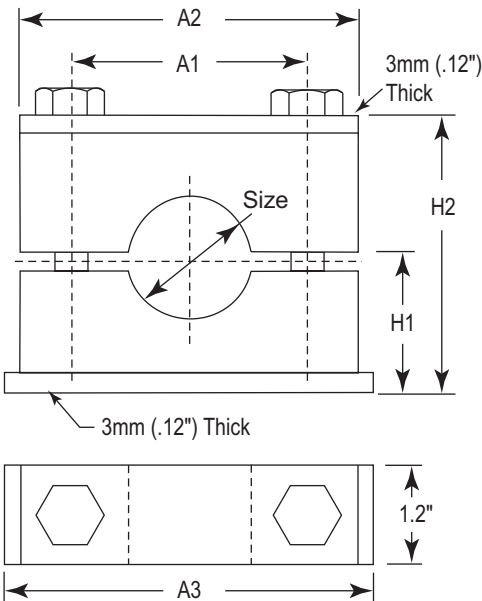


Steel w/  
Aluminum  
Cushion

### BETA STANDARD SERIES

- Cushions are Polypropylene (Green Color)
- Recommended for systems with less than 1500 PSI without dynamic loads.
- Use for standard hydraulics, general pipe construction, electrical cables, and general duty piping applications subject to moderate levels of shock and vibration.
- Aluminum cushions and are used in higher heat applications up to 500 Degrees.

**INSTALLATION** - Refer to pages 115-116 for complete installation guide.

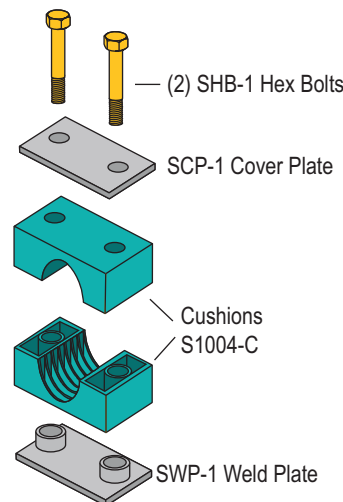


Group	Part No. *	Tube Size	Pipe Size	Metric Size	Dimensions - inch (mm)					Wt/ 100	Bolt	
					A1	A2	A3	H1	H2			
S1	S-1004	1/4" (0.250)	-	-								
	S-1006	3/8" (0.375)	-	-								
	SM-1006	-	-	6mm	0.78 (20)	1.34 (34)	1.41 (36)	0.62 (16)	1.25 (32)	17	1/4"-20 x 1 1/4"	
	S-1007	-	1/8" (0.405)	-								
	SM-1008	-	-	8mm								
	SM-1012	-	-	12mm								
S2	S-2008	1/2" (0.500)	-	-								
	S-2009	-	1/4" (0.540)	-								
	S-2010	5/8" (0.625)	-	-								
	S-2011	-	3/8" (0.675)	-	1.02 (26)	1.57 (40)	1.65 (42)	0.76 (19.5)	1.54 (39)	20	1/4"-20 x 1 3/8"	
	SM-2014	-	-	14mm								
	SM-2015	-	-	15mm								
	SM-2018	-	-	18mm								
	S3	S-3012	3/4" (0.750)	-	-							
S-3014	-	1/2" (0.840)	-									
S-3015	7/8" (0.875)	-	-									
S-3016	1" (1.000)	-	-	1.29 (33)	1.96 (50)	2.04 (52)	0.80 (20.5)	1.61 (41)	24	1/4"-20 x 1 1/2"		
SM-3020	-	-	20mm									
SM-3025	-	-	25mm									
S4	S-4017	-	3/4" (1.050)	-	1.57 (40)	2.28 (58)	2.36 (60)	0.94 (24)	1.88 (48)	30	1/4"-20 x 1 3/4"	
	S-4018	1 1/8" (1.125)	-	-								
	SM-4030	-	-	30mm								
S5	S-5020	1 1/4" (1.250)	-	-								
	S-5021	-	1" (1.315)	-								
	S-5024	1 1/2" (1.500)	-	-	2.04 (52)	2.75 (70)	2.83 (72)	1.25 (32)	2.52 (64)	40	1/4"-20 x 2 1/2"	
	S-5027	-	1 1/4" (1.660)	-								
	SM-5035	-	-	35mm								
S6	S-6028	1 3/4" (1.750)	-	-	2.59 (66)	3.38 (86)	3.46 (88)	1.41 (36)	2.83 (72)	47	1/4"-20 x 2 3/4"	
	S-6030	-	1 1/2" (1.900)	-								
	S-6032	2" (2.000)	-	-								
S7	S-7038	-	2" (2.375)	-								
	S-7036	2 1/4" (2.250)	-	-	3.70 (94)	4.75 (121)	4.81 (122)	2.00 (51)	4.05 (103)	97	1/4"-20 x 4"	
	S-7040	2 1/2" (2.500)	-	-								
	S-7044	2 3/4" (2.750)	-	-								
	S-7048	3" (3.000)	-	-								
SUFFIX	*For additional sizes contact factory. Note: Add assembly type to part number. Example: <b>S-1004S-SS</b> provides the complete assembly as shown with stainless steel components. NOTE: SM (metric) only available in Steel with Polypropylene (green) cushion.											
		Components	Cushion	Example								
	none	Steel	Polypropylene (green)	<b>S-1004S</b>								
	-AL	Steel	Aluminum	<b>S-1004S-AL</b>								
-SS	Stainless Steel	Polypropylene (green)	<b>S-1004S-SS</b>									



STANDARD SERIES COVER PLATE			STANDARD SERIES SAFETY PLATE		
	SCP-1	Use with Group S1		SP-1	Use with Group S1
	SCP-2	Use with Group S2		SP-2	Use with Group S2
	SCP-3	Use with Group S3		SP-3	Use with Group S3
	SCP-4	Use with Group S4		SP-4	Use with Group S4
	SCP-5	Use with Group S5		SP-5	Use with Group S5
	SCP-6	Use with Group S6		SP-6	Use with Group S6
	SCP-7	Use with Group S7			
HEX BOLT (Two required per assembly)			STANDARD SERIES CAP SCREW (Two required per assembly)		
	SHB-1	Use with Group S1		SC-1	Use with Group S1
	SHB-2	Use with Group S2		SC-2	Use with Group S2
	SHB-3	Use with Group S3		SC-3	Use with Group S3
	SHB-4	Use with Group S4		SC-4	Use with Group S4
	SHB-5	Use with Group S5		SC-5	Use with Group S5
	SHB-6	Use with Group S6		SC-6	Use with Group S6
	SHB-7	Use with Group S7			
STACKING BOLTS (Two required per assembly)			C-RAIL NUT (Two required per assembly)		
	SB-1	Use with Group S1		SRN-1-6	1/4" nut, Use with SCR Rail
	SB-2	Use with Group S2			
	SB-3	Use with Group S3			
	SB-4	Use with Group S4			
	SB-5	Use with Group S5			
	SB-6	Use with Group S6			
STANDARD SERIES WELD PLATE			C-RAIL		
	SWP-1	Use with Group S1		SCR-1	39" (1 meter)
	SWP-2	Use with Group S2		SCR-2	78" (2 meter)
	SWP-3	Use with Group S3		 <p>28 mm, 11 mm, 2 mm, 11 mm</p>	
	SWP-4	Use with Group S4			
	SWP-5	Use with Group S5			
	SWP-6	Use with Group S6			
	SWP-7	Use with Group S7			
STRUT NUT - For connection to Z-Strut Channel (Two required per assembly)			Z-Strut		
	ZSA1-8	Use with Groups S1-S8		Z1625	1-5/8" x 1-5/8"
				Z8125	1-5/8" x 13/16"
		Z1000		1-5/8" x 1"	
		Z875		1-5/8" x 7/8"	

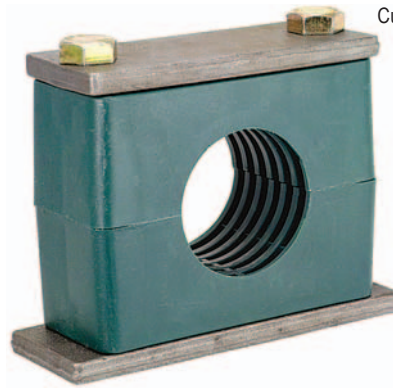
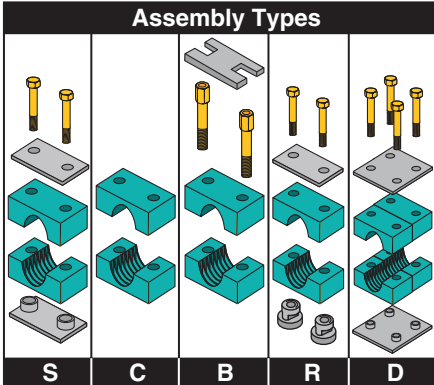
ORDERING EXAMPLE		
<b>S-1004-S</b>		
Assembly Includes		
Quantity	Part No.	Description
1 Each	SWP-1	Weld Plate
1 Each	SCP-1	Cover Plate
2 Each	SHB-1	Hex Bolts
1 set	S1004-C	Cushions



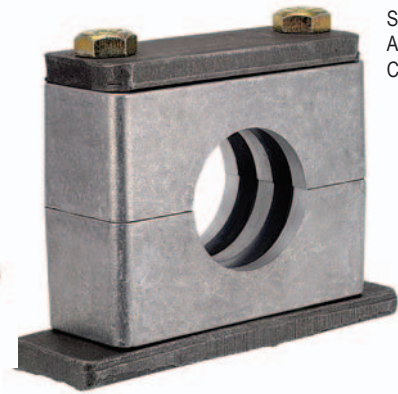


## BETA CLAMPS

### HEAVY SERIES



Steel w/  
Polypropylene  
Cushion

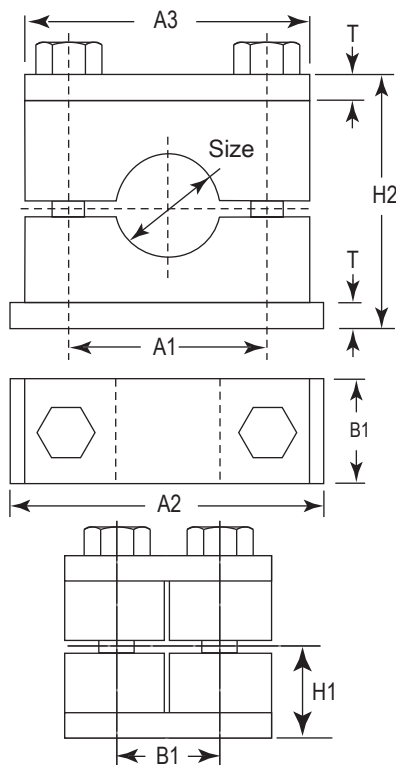


Steel w/  
Aluminum  
Cushion

### BETA HEAVY SERIES

- Recommended systems with greater than 1500 PSI operating pressure, operations with pressure surges, and applications with wide temperature fluctuations.
- Absorbs high levels of shock, noise, and vibration
- Cushions are polypropylene (Green color) or Aluminum.
- Aluminum cushions and are used in higher heat applications up to 500 Degrees.

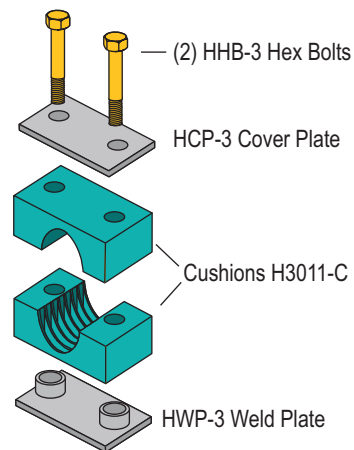
**INSTALLATION** - Refer to pages 115-116 for complete installation guide.



Group	Part No.	Tube Size	Pipe Size	Dimensions-inch(mm)						Wt/100	Hex Bolt	
				A1	A2	A3	B1	H1	H2			T
H3	H-3004	1/4" (0.250)	-	1.29 (33)	2.87 (73)	2.16 (55)	1.18 (30)	0.94 (24)	1.88 (48)	0.31 (8)	65	3/8"-16 x 1-3/4"
	H-3006	3/8" (0.375)	-								65	
	H-3007	-	1/8" (0.405)								65	
	H-3008	1/2" (0.500)	-								65	
	H-3009	-	1/4" (0.540)								65	
	H-3010	5/8" (0.625)	-								65	
H4	H-3011	-	3/8" (0.675)	1.77 (45)	3.34 (85)	2.75 (70)	1.18 (30)	1.25 (32)	2.51 (64)	0.31 (8)	83	3/8"-16 x 2-1/4"
	H-4012	3/4" (0.750)	-								82	
	H-4014	-	1/2" (0.840)								83	
	H-4015	7/8" (0.875)	-								83	
	H-4016	1" (1.000)	-								83	
H5	H-4017	-	3/4" (1.050)	2.36 (60)	3.93 (100)	3.30 (84)	1.18 (30)	1.49 (38)	2.99 (76)	0.31 (8)	104	3/8"-16 x 2-3/4"
	H-5020	1/4" (1.250)	-								104	
	H-5021	-	1" (1.315)								103	
	H-5022	1 1/2" (1.500)	-								103	
H6	H-5027	-	1 1/4" (1.660)	3.54 (90)	5.90 (150)	4.52 (115)	1.77 (45)	2.16 (55)	4.33 (110)	0.39 (10)	266	1/2"-13 x 4"
	H-6028	1 3/4" (1.750)	-								276	
	H-6030	-	1 1/2" (1.900)								267	
	H-6032	2" (2.000)	-								266	
	H-6034	2 1/4" (2.250)	-								267	
	H-6038	2 3/8" (2.375)	2" (2.375)								264	
H7	H-6040	2 1/2" (2.500)	-	4.80 (122)	7.08 (180)	5.98 (152)	2.36 (60)	2.75 (70)	5.51 (140)	0.39 (10)	510	5/8"-11x 5-1/4"
	H-7044	2 3/4" (2.750)	-								525	
	H-7046	-	2 1/2" (2.870)								506	
	H-7050	3" (3.000)	-								495	
	H-7056	-	3" (3.500)								510	
H8	H-7057	3 1/2" (3.500)	-	6.61 (168)	8.86 (225)	8.07 (205)	3.15 (80)	3.94 (100)	7.87 (200)	0.59 (15)	635	3/4"-10 x 7-1/2"
	H-8072	-	4" (4.500)									
H9	H-9089	-	5" (5.563)	8.07 (221)	10.63 (270)	9.92 (252)	3.54 (90)	4.53 (115)	9.06 (230)	0.59 (15)	625	7/8"-9 x 8-1/4"
	H-9106	-	6" (6.625)								635	
				*For additional sizes contact factory. Note: Add assembly type to part number. Example: <b>H-3004S-SS</b> provides the complete assembly as shown with stainless steel components.								
	<b>SUFFIX</b>			Components	Cushion	Example (complete assembly):						
	<b>NONE</b>			Steel	Polypropylene (green)	<b>H-3004S</b>						
	<b>-AL</b>			Steel	Aluminum	<b>H-3004S-AL</b>						
	<b>-SS</b>			Stainless Steel	Polypropylene (green)	<b>H-3004S-SS</b>						

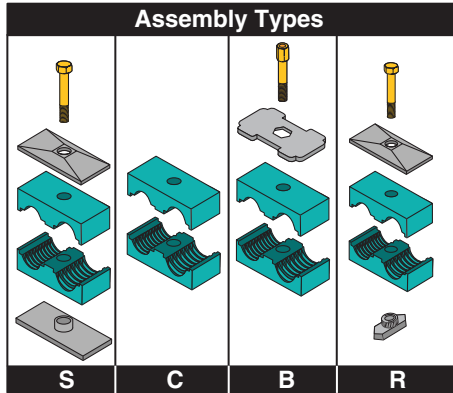
HEAVY SERIES COVER PLATE			HEAVY SERIES SAFETY PLATE			C-RAIL NUTS (Two required per single assembly)					
	HCP-3	Use w/Group H3		HSP-3	Use w/Group H3		HRN-3-5	3/8" nut, Use w/ Groups H3-H5			
	HCP-4	Use w/Group H4		HSP-4	Use w/Group H4		HRN-6	7/16" nut, Use w/ Group H6			
	HCP-5	Use w/Group H5		HSP-5	Use w/Group H5		Note: Rail mounted stacking kit is only available on groups H3, H4, and H5				
	HCP-6	Use w/Group H6		HSP-6	Use w/Group H6						
	HCP-7	Use w/Group H7		HSP-7	Use w/Group H7						
	HCP-8	Use w/Group H8		HSP-8	Use w/Group H8						
	HCP-9	Use w/Group H9		HSP-9	Use w/Group H9						
	HEAVY SERIES HEX BOLTS (Two required per single assembly)			HEAVY SERIES STACKING BOLTS (Two required per single assembly)			C-RAIL				
		HHB-3		Use w/Group H3			HSB-3	Use w/Group H3		HCR-1	39" (1 meter)
HHB-4		Use w/Group H4	HSB-4	Use w/Group H4		HCR-2	78" (2 meter)				
HHB-5		Use w/Group H5	HSB-5	Use w/Group H5							
HHB-6		Use w/Group H6	HSB-6	Use w/Group H6							
HHB-7		Use w/Group H7	HSB-7	Use w/Group H7							
HHB-8		Use w/Group H8	HSB-8	Use w/Group H8							
HHB-9		Use w/Group H9	HSB-9	Use w/Group H9							
HEAVY SERIES WELD PLATE			HEAVY SERIES DOUBLE WELD PLATE			HEAVY SERIES DOUBLE COVER PLATE					
		HWP-3	Use w/Group H3			HDP-3	Use w/Group H3			DCP-3	Use w/Group H3
	HWP-4	Use w/Group H4	HDP-4		Use w/Group H4	DCP-4	Use w/Group H4				
	HWP-5	Use w/Group H5	HDP-5		Use w/Group H5	DCP-5	Use w/Group H5				
	HWP-6	Use w/Group H6	HDP-6		Use w/Group H6	DCP-6	Use w/Group H6				
	HWP-7	Use w/Group H7	HDP-7		Use w/Group H7	DCP-7	Use w/Group H7				
	HWP-8	Use w/Group H8									
	HWP-9	Use w/Group H9									

ORDERING EXAMPLE		
<b>H3004-S</b>		
Assembly Includes		
Quantity	Part No.	Description
1 Each	HWP-3	Weld Plate
1 Each	HCP-3	Cover Plate
2 Each	HHB-3	Hex Bolts
1 set	H3011-C	Cushions



## BETA CLAMPS

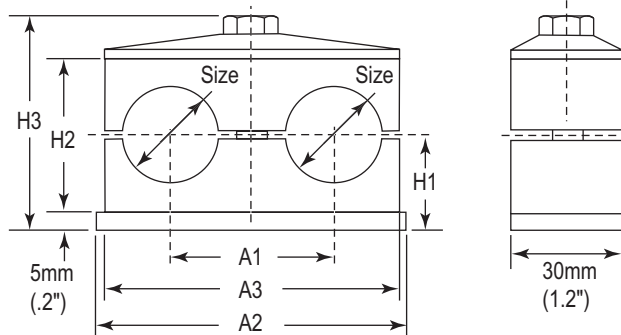
### TWIN SERIES



**BETA CLAMPS TWIN SERIES** are ideal for general-duty applications subject to moderate levels of shock and vibration. Cushions in this series are Polypropylene (Green Color).

Call factory for additional sizes and cushion materials

**INSTALLATION** - Refer to pages 115-116 for complete installation guide.

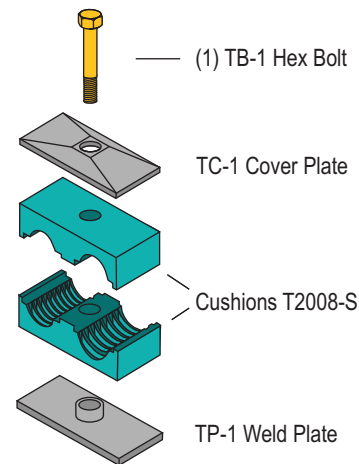


Group	Steel Part No.	Stainless Steel Part No.	Tube Size	Pipe Size	Dimensions - inch (mm)						WT/100	Hex Bolt
					A1	A2	A3	H1	H2	H3		
T1	T-1004	T-1004-SS	1/4 (0.250)	-							21	1/4"-20 x 1-3/8"
	T-1006	T-1006-SS	3/8 (0.375)	-	0.78 (20)	1.45 (37)	1.41 (36)	0.72 (18.5)	1.06 (27)	1.69 (43)	21	
	T-1007	T-1007-SS	-	1/8 (0.405)							21	
T2	T-2008	T-2008-SS	1/2" (0.500)	-							31	5/16"-18 x 1-3/8"
	T-2009	T-2009-SS	-	1/4 (0.540)	1.14 (29)	2.16 (55)	2.08 (53)	0.70 (18)	1.02 (26)	1.71 (43.5)	31	
	T-2010	T-2010-SS	5/8 (0.625)	-							31	
	T-2011	T-2011-SS	-	3/8 (0.675)							31	
T3	T-3012	T-3012-SS	3/4 (0.750)	-							40	5/16"-18 x 1-3/4"
	T-3014	T-3014-SS	-	1/2 (0.840)	1.41 (36)	2.75 (70)	2.63 (67)	0.92 (23.5)	1.45 (37)	2.14 (54.5)	39	
	T-3015	T-3015-SS	7/8 (0.875)	-							39	
	T-3016	T-3016-SS	1 (1.000)	-							38	
T4	T-4017	T-4017-SS	-	3/4 (1.050)	1.77 (45)	3.34 (85)	3.22 (82)	1.02 (26)	1.65 (42)	2.34 (59.5)	49	5/16"-18 x 2"
	T-4018	T-4018-SS	1-1/8 (1.125)	-							49	
T5	T-5020	T-5020-SS	1-1/4 (1.250)	-							65	5/16"-18 x 2-3/8"
	T-5021	T-5021-SS	-	1 (1.315)	2.20 (56)	4.33 (110)	4.17 (106)	1.25 (32)	2.12 (54)	2.81 (71.5)	65	
	T-5024	T-5024-SS	1-1/2 (1.500)	-							64	
	T-5027	T-5027-SS	-	1-1/4 (1.660)							62	

\*For additional sizes and stainless steel contact factory.  
 Note: Add Assembly type to Part No.- Example: T-1004S provides the complete assembly as shown

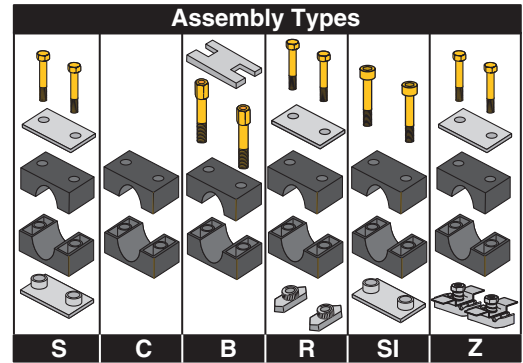
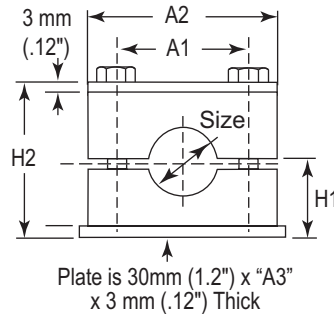
TWIN SERIES COVER PLATE			TWIN SERIES SAFETY PLATE		
	TC-1	Use with Group T1		TSP-1	Use with Group T1
	TC-2	Use with Group T2		TSP-2	Use with Group T2
	TC-3	Use with Group T3		TSP-3	Use with Group T3
	TC-4	Use with Group T4		TSP-4	Use with Group T4
	TC-5	Use with Group T5		TSP-5	Use with Group T5
TWIN HEX BOLT			C-RAIL NUT		
	TB-1	Use with Group T1		SRN-1-6	1/4" Nut, Use with Group T1
	TB-2	Use with Group T2		TRN-2-5	5/16" Nut, Use with Group T2 to T5
	TB-3	Use with Group T3			
	TB-4	Use with Group T4			
	TB-5	Use with Group T5			
TWIN STACKING BOLT			C-RAIL		
	TSB-1	Use with Group T1		SCR-1	39" (1 meter)
	TSB-2	Use with Group T2		SCR-2	78" (2 meter)
	TSB-3	Use with Group T3		 28 mm, 11 mm, 2 mm, 11 mm	
	TSB-4	Use with Group T4			
	TSB-5	Use with Group T5			
TWIN SERIES WELD PLATE					
	TP-1	Use with Group T1			
	TP-2	Use with Group T2			
	TP-3	Use with Group T3			
	TP-4	Use with Group T4			
	TP-5	Use with Group T5			

ORDERING EXAMPLE		
<b>T2008-S</b>		
<b>Assembly Includes</b>		
Quantity	Part No.	Description
1 Each	TP-1	Weld Plate
1 Each	TC-1	Cover Plate
1 Each	TB-1	Hex Bolts
1 set	T2008-S	Cushions



## BETA "SMOOTHIE"

### STANDARD SERIES



Beta "Smoothie" is ideal for general-duty applications where there is a need to reduce wear on hose connection caused by vibration and surge.

- Chamfered and smooth core protects hose cover and extends the life of the hose
- Uses Standard Beta hardware
- Reduces wear on hose connection caused by vibration and surge

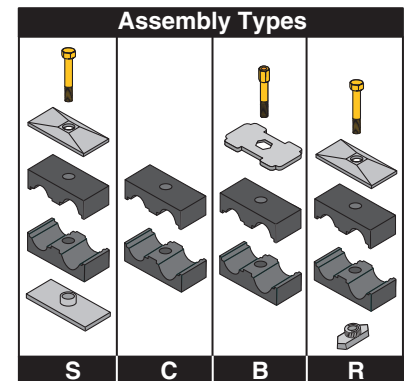
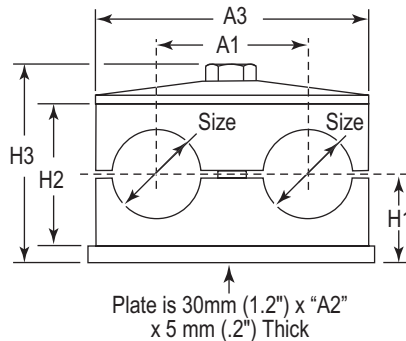
**INSTALLATION** - Refer to pages 115-116 for complete installation guide.

Group	Part No.	SAE 100R1 Hose Size	Dimensions (Inches)					WT/100	Bolt
			A1	A2	A3	H1	H2		
S2	S-2004H	1/4" (0.53)	1.02	1.57	1.65	0.76	1.535	20	1/4 - 20
	S-2006H	3/8" (0.69)	1.02	1.57	1.65	0.76	1.535	20	x 13/8
S3	S-3008H	1/2" (0.81)	1.29	1.96	2.04	0.80	1.61	25	1/4 - 20
	S-3010H	5/8" (0.93)	1.29	1.96	2.04	0.80	1.61	25	x 1 1/2
S4	S-4012H	3/4" (1.10)	1.57	2.28	2.36	0.94	1.88	29	1/4 - 20 x 1 3/4
S5	S-5016H	1" (1.42)	2.05	2.75	2.83	1.25	2.52	39	1/4 - 20 x 2 1/2

\*For additional sizes and stainless steel contact factory.  
Note: Add Assembly type to Part No.- Example: **S-2004HS** provides the complete assembly as shown

## BETA "SMOOTHIE"

### TWIN SERIES



Beta "Smoothie" is ideal for general-duty applications where there is a need to reduce wear on hose connection caused by vibration and surge.

- Chamfered and smooth core protects hose cover and extends the life of the hose
- Uses Standard Beta Twin hardware
- Reduces wear on hose connection caused by vibration and surge

**INSTALLATION** - Refer to pages 115-116 for complete installation guide.

Group	Part No.	SAE 100R1 Hose Size	Dimensions (Inches)						WT/100	Bolt
			A1	A2	A3	H1	H2	H3		
T2	T-2004H	1/4" (0.53)	1.14	2.16	2.08	0.70	1.02	1.71	31	5/16 - 18
	T-2006H	3/8" (0.69)	1.14	2.16	2.08	0.70	1.02	1.71	31	x 1 3/8
T3	T-3008H	1/2" (0.81)	1.41	2.75	2.63	0.92	1.45	2.14	39	5/16 - 18 x 1 3/4
T4	T-4010H	5/8" (0.93)	1.77	3.34	3.22	1.02	1.65	2.34	49	5/16 - 18
	T-4012H	3/4" (1.10)	1.77	3.34	3.22	1.02	1.65	2.34	49	x 2
T5	T-5016H	1" (1.42)	2.2	4.33	4.17	1.25	2.12	2.81	65	5/16 - 18 x 2 3/8

\*For additional sizes and stainless steel contact factory.  
Note: Add Assembly type to Part No.- Example: **T-2004HS** provides the complete assembly as shown

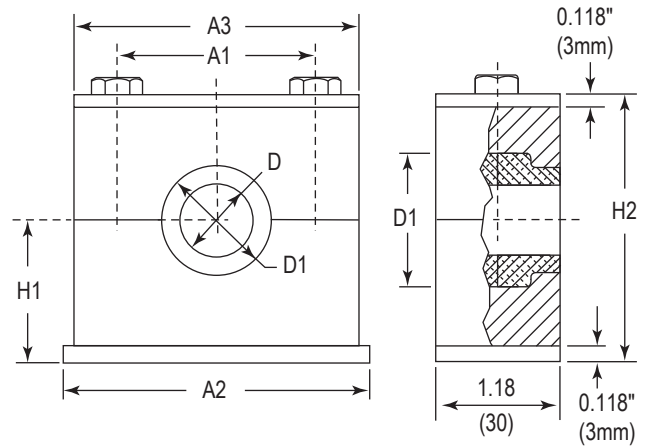
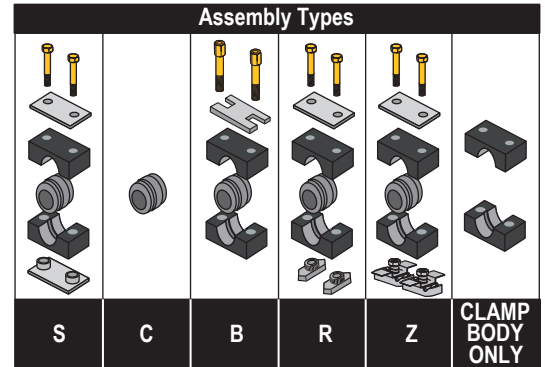
## BETA CLAMPS

### STANDARD RUBBER INSERT



- One cushion block provides flexible size range of cushioning.
- Smooth bore core can be used on hose, or for vibration reduction
- Broad range of metric sizes.
- Maintains center line when used in groups.

**INSTALLATION** - Refer to pages 115-116 for complete installation guide.



Group	Part No.	Bore Size Ø D in (mm)	Tube O.D.	Pipe Size	Nom. Size Hose O.D. Min - Max	Dimensions – inches (mm)						Bolt Size	
						D	D1	H1	H2	A1	A2		A3
S4	SM4006RI	0.24 (6)	-	-	0.22 - 0.24	1.00 (25.5)	1.22 (31)	0.925 (23.5)	1.85 (47)	1.57 (40)	2.32 (59)	2.24 (57)	1/4-20 x1-3/4
	SM4008RI	0.32 (8)	1/16"	-	0.30 - 0.32								
	S4007RI	0.39 (10)	-	1/8"	0.37 - 0.39								
	SM4012RI	0.47 (12)	-	-	0.45 - 0.47								
	S4008RI	0.50 (13)	1/2"	-	0.48 - 0.50								
	SM4014RI	0.55 (14)	-	-	0.53 - 0.55								
	SM4015RI	0.59 (15)	-	-	0.57 - 0.59								
	S4010RI	0.63 (16)	5/8"	-	0.61 - 0.63								
	S4011RI	0.68 (17)	-	3/8"	0.66 - 0.68								
S4012RI	0.75 (19)	3/4"	-	0.73 - 0.75									
S4C	Clamp Body Only (Group S4)												
S6	S6014RI	0.79 (20)	-	1/2"	0.77 - 0.79	1.54 (39)	1.81 (46)	1.40 (35.5)	2.80 (71)	2.60 (66)	3.46 (88)	3.39 (86)	1/4-20 x2-3/4
	S6015RI	0.87 (22)	7/8"	-	0.85 - 0.87								
	S6016RI	0.98 (25)	1"	-	0.96 - 0.98								
	S6017RI	1.06 (27)	-	3/4"	1.04 - 1.06								
	SM6028RI	1.10 (28)	-	-	1.08 - 1.10								
	SM6030RI	1.18 (30)	-	-	1.16 - 1.18								
	S6020RI	1.26 (32)	1-1/4"	-	1.24 - 1.26								
S6C	Clamp Body Only (Group S5)												

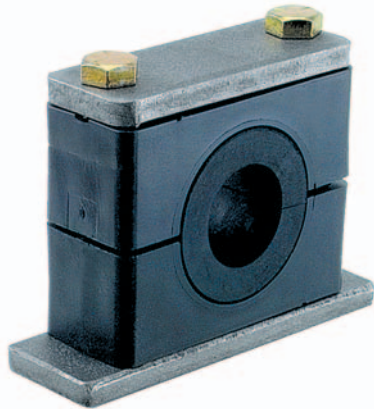
\*For additional sizes and stainless steel contact factory.

Note: Add Assembly type to Part No.- Example: **SM4006RIS** provides the complete assembly as shown



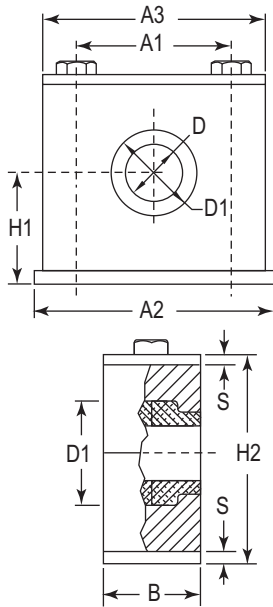
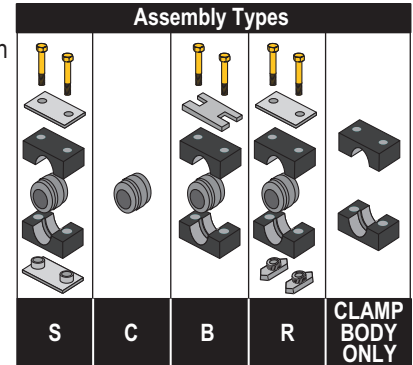
## BETA CLAMPS

### HEAVY RUBBER INSERT



- One cushion block provides flexible size range of cushioning.
- Smooth bore core can be used on hose, or for vibration reduction
- Broad range of metric sizes.
- Maintains center line when used in groups.
- Used for high pressure hydraulics and heavy duty operations.
- Used for intermittent load and high oil speeds.
- Increase size range over standard series.

**INSTALLATION** - Refer to pages 115-116 for installation guide.

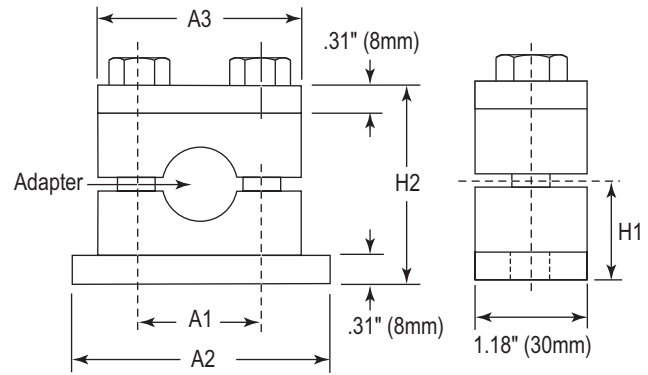


Group	Part No.	Bore Ø D in. (mm)	Tube O.D.	Pipe Size	Nom. Size Hose O.D.	Dimensions – inches (mm)								Bolt Size	
						D	D1	B	H1	H2	A1	A2	A3		S
H4	HM4006RI	0.24 (6)	-	-	0.22 - 0.24	1.00 (25.5)	1.24 (31.5)	1.18 (30)	1.22 (31)	2.44 (62)	1.77 (45)	3.35 (85)	2.76 (70)	0.32 (8)	3/8-16x 2-1/4
	HM4008RI	0.32 (8)	1/16"	-	0.30 - 0.32										
	H4007RI	0.39 (10)	-	1/8"	0.37 - 0.39										
	HM4012RI	0.47 (12)	-	-	0.45 - 0.47										
	H4008RI	0.50 (12.7)	1/2"	-	0.48 - 0.50										
	HM4014RI	0.55 (14)	-	-	0.53 - 0.55										
	HM4015RI	0.59 (15)	-	-	0.57 - 0.59										
	H4010RI	0.63 (16)	5/8"	-	0.61 - 0.63										
	H4011RI	0.68 (17.2)	-	3/8"	0.66 - 0.68										
	H4012RI	0.75 (19)	3/4"	-	0.73 - 0.75										
H4C	Clamp Body Only (Group H4)														
H5	H5014RI	0.79 (20)	-	1/2"	0.77 - 0.79	1.54 (39)	1.83 (46.5)	1.18 (30)	1.46 (37)	2.91 (74)	2.36 (60)	3.94 (100)	3.35 (85)	0.32 (8)	3/8-16x 2-3/4
	H5015RI	0.87 (22)	7/8"	-	0.85 - 0.87										
	H5016RI	0.98 (25)	1"	-	0.96 - 0.98										
	H5017RI	1.06 (26.9)	-	3/4"	1.04 - 1.06										
	HM5028RI	1.10 (28)	-	-	1.08 - 1.10										
	HM5030RI	1.18 (30)	-	-	1.16 - 1.18										
	H5020RI	1.26 (32)	1-1/4"	-	1.24 - 1.26										
H5C	Clamp Body Only (Group H5)														
H6	H6021RI	1.33 (33.7)	-	1"	1.31 - 1.33	2.56 (65)	2.91 (74)	1.77 (45)	2.11 (53.5)	4.21 (107)	3.56 (90.5)	5.51 (140)	4.53 (115)	0.39 (10)	1/2-13x 4
	HM6035RI	1.38 (35)	-	-	1.36 - 1.38										
	H6024RI	1.50 (38)	1-1/2"	-	1.48 - 1.50										
	HM6040RI	1.58 (40)	-	-	1.56 - 1.58										
	H6027RI	1.65 (42)	-	1-1/4"	1.63 - 1.65										
	HM6045RI	1.79 (45.5)	-	-	1.77 - 1.79										
	H6030RI	1.89 (48)	-	1-1/2"	1.87 - 1.89										
	H6032RI	2.01 (51)	2"	-	1.99 - 2.01										
	H6034RI	2.10 (53.4)	2-1/8"	-	2.08 - 2.10										
HM6056RI	2.22 (56.4)	-	-	2.2 - 2.22											
H6C	Clamp Body Only (Group H6)														
H7	H7038RI	2.36 (60)	-	2"	2.34 - 2.36	3.50 (89)	3.86 (98)	2.36 (60)	2.70 (68.5)	5.39 (137)	4.80 (122)	7.09 (180)	5.98 (152)	0.39 (10)	5/8-11x 5-1/2
	HM7065RI	2.56 (65)	-	-	2.54 - 2.56										
	HM7070RI	2.76 (70)	-	-	2.74 - 2.76										
	H7046RI	2.87 (73)	-	2-1/2"	2.85 - 2.87										
	H7050RI	2.99 (76)	3"	-	2.97 - 2.99										
H7C	Clamp Body Only (Group H7)														
H8	HM8083RI	3.27 (83)	-	-	3.19 - 3.27	4.57 (116)	5.20 (132)	3.15 (80)	3.88 (98.5)	7.76 (197)	6.61 (168)	8.86 (225)	8.07 (205)	0.59 (15)	3/4-10x 7-1/2
	H8056RI	3.50 (89)	3-1/2"	3"	3.43 - 3.50										
	H8C	Clamp Body Only (Group H8)													

\*For additional sizes and stainless steel contact factory.







The **BETA-ADAPTER** allows a clamping junction to be inserted into virtually any hydraulic line. The exclusive square bodied junction adapter design can be used with metallic tubing or hydraulic hose ends. It provides a point of union for hydraulic runs which transition from one form of conveyance to another (i.e. hose to tubing). Once inserted into the customized Beta-Adapter clamp body, the junction point is securely clamped fighting the effects of vibration, insuring a leak-free system.

- Beta-Adapter cushions can also be used with rubber inserts.
- Z-Clamp split bushings from Group 1 can be utilized with the basic Beta-Adapter Group 4 cushion.
- Z-Clamp bushings from Group 2 coincide with Group 5 Beta-Adapter assemblies.
- The split bushings provide extra vibration absorption for delicate clamping surfaces.

**INSTALLATION** - Refer to page 117 for complete installation guide.



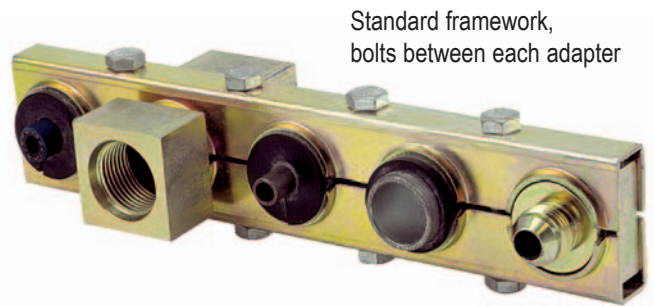
	A1	A2	A3	H1	H2	Hex Bolt
<b>Group 1 H4 BETA</b>	45mm 1.77	85mm 3.34	70mm 2.75	32mm 1.25	64mm 2.51	3/8"-16 x 2-1/4"
<b>Group 2 H5 BETA</b>	60mm 2.36	100mm 3.93	84mm 3.30	38mm 1.49	76mm 2.99	3/8"-16 x 2-3/4"

	Tube Size	Group 1 (H4) Part No.	Group 2 (H5) Part No.
	1/4"	H4MJA1-4-S	H5MJA2-4-S
	3/8"	H4MJA1-6-S	H5MJA2-6-S
	1/2"	H4MJA1-8-S	H5MJA2-8-S
	5/8"	H4MJA1-10-S	H5MJA2-10-S
	3/4"	-	H5MJA2-12-S
	5/8"	-	H5MJA2-14-S
	1"	-	H5MJA2-16-S
	3/8"	H4MJO1-6-S	H5MJO2-6-S
	1/2"	H4MJO1-8-S	H5MJO2-8-S
	5/8"	H4MJO1-10-S	H5MJO2-10-S
	3/4"	-	H5MJO2-12-S
	1"	-	H5MJO2-16-S
	1/2"	H4FJA1-8-S	-
	3/4"	-	H5FJA2-12-S
	3/8" NPT	H4FJA1-6P-S	H5FJA2-12P-S
	-	H4JCN-C	H5JCN-C
	-	HAC-1 (1-1/2" SERIES) CAN BE USED	HAC-2 (2" SERIES) CAN BE USED

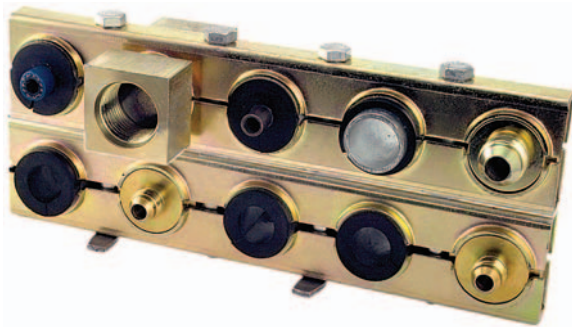
## Z-CLAMP UNITS

The **Z-Clamp** is designed to maintain a consistent center line dimension for horizontal clamping or vertical stackable clamping applications. Z-Clamp maintains that center line while accommodating the same, or different diameter tubing, hose or pipe. Suited for all types of hydraulic hose, tubing, and pipe clamping applications, the Z-Clamp provides yet another alternative to the broadest cushion clamping product line in the world.

A Z-Clamp consists of an adapter framework which is offered in two versions. One has mounting bolts between each adapter insert and the other has two additional mounting bolts at each end of the frame.



Standard framework, bolts between each adapter



Z-Clamps can be stacked for even more line clamping ability.



Outside hole framework, bolts between each adapter and two additional bolts at each end

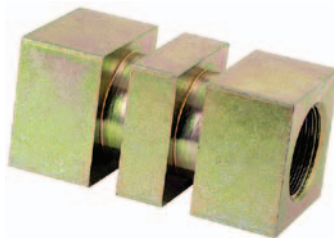
## Z-CLAMP & BETA ADAPTER

### OPTIONAL ADAPTERS



O-RING FACE SEAL

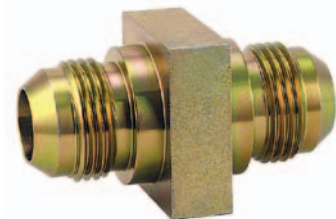
FEMALE JUNCTION ADAPTER



The Z-Clamp inserts are also used with the Beta Adapter.



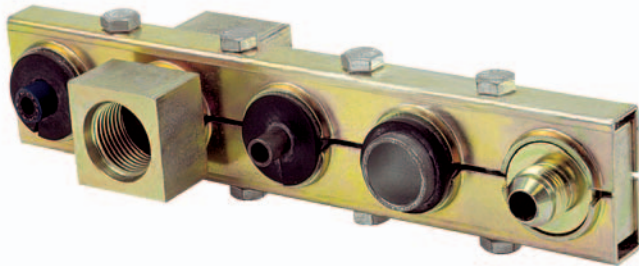
RUBBER SPLIT BUSHINGS



37° FLARE MALE JUNCTION ADAPTER

## Z-CLAMP - MULTIPLE LINE CLAMPING SYSTEM

### STANDARD CLAMP UNITS

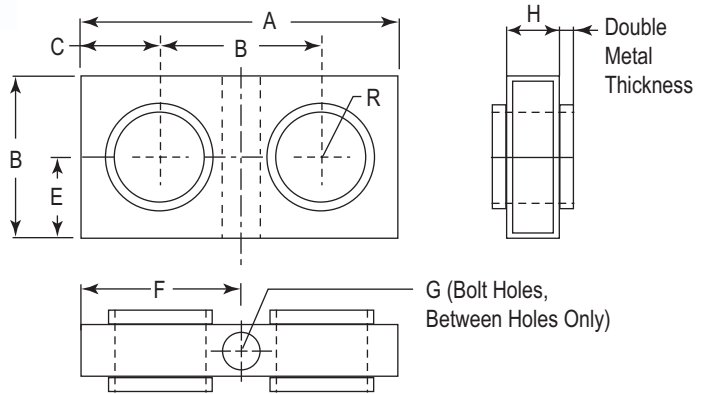


The standard Z-Clamp unit features an anchor bolt between each of the adapter inserts.

The junction adapter provides break points in lines allowing for shorter hose and tubing runs reducing leaks at connection points by securing the adapter against vibration within the Z-Clamp units. These break points may also serve as securely clamped changeover points between hose and tube, and vice versa.

- Stackable for space conservation
- Maintains consistent center line dimensions between lines both horizontally and vertically (in a stacking application)
- Mix and match pipe, tube, hose and junction adapters
- Suited for all types of hydraulic applications
- Available in standard and outside hole mounting configurations

**INSTALLATION** - Refer to page 117 for complete installation guide.



**Note:** Adapters and Hardware are ordered separately. Please see pages 53-55 for selection of these items.



Part No.	# Adapter Holes	# Bolts	A	B	C	E	F	G	H	R
<b>HAC-1 Series 1-1/2" 14 Gauge</b>										
HAC-1-2	2	1	2.938"	1.5"	0.719"	0.75"	1.469"	0.344"	0.550"	0.422"
HAC-1-3	3	2	4.406"	1.5"	0.719"	0.75"	1.469"	0.344"	0.550"	0.422"
HAC-1-4	4	3	5.940"	1.5"	0.719"	0.75"	1.469"	0.344"	0.550"	0.422"
HAC-1-5	5	4	7.140"	1.5"	0.594"	0.75"	1.343"	0.344"	0.550"	0.422"
HAC-1-6	6	5	8.938"	1.5"	0.719"	0.75"	1.469"	0.344"	0.550"	0.422"
HAC-1-7	7	6	10.188"	1.5"	0.594"	0.75"	1.343"	0.344"	0.550"	0.422"
HAC-1-32	32	31	48.00"	1.5"	-	0.75"	-	0.344"	0.550"	0.422"
<b>HAC-2 Series 2" 14 Gauge</b>										
HAC-2-2	2	1	3.875"	2"	0.938"	1"	1.938"	0.344"	0.550"	0.594"
HAC-2-3	3	2	5.641"	2"	0.844"	1"	1.844"	0.344"	0.550"	0.594"
HAC-2-4	4	3	7.891"	2"	0.938"	1"	1.938"	0.344"	0.550"	0.594"
HAC-2-5	5	4	9.672"	2"	0.844"	1"	1.844"	0.344"	0.550"	0.594"
HAC-2-6	6	5	11.672"	2"	0.813"	1"	1.813"	0.344"	0.550"	0.594"
HAC-2-7	7	6	13.625"	2"	0.813"	1"	1.813"	0.344"	0.550"	0.594"
HAC-2-24	24	23	48.00"	2"	-	1"	-	0.344"	0.550"	0.594"
<b>HAC-3 Series 3" 11 Gauge</b>										
HAC-3-2	2	1	6.766"	3"	1.875"	1.5"	3.375"	0.406"	0.750"	1.063"
HAC-3-3	3	2	8.703"	3"	1.406"	1.5"	2.984"	0.406"	0.750"	1.063"
HAC-3-4	4	3	11.703"	3"	1.406"	1.5"	2.797"	0.406"	0.750"	1.063"
HAC-3-5	5	4	14.703"	3"	1.406"	1.5"	2.859"	0.406"	0.750"	1.063"
HAC-3-6	6	5	17.703"	3"	1.406"	1.5"	2.859"	0.406"	0.750"	1.063"
HAC-3-16	16	15	48.00"	3"	-	1.5"	-	0.406"	0.750"	1.063"

NOTE: Hardware & Adapters not included.

# Z-Clamp - Outside Holes

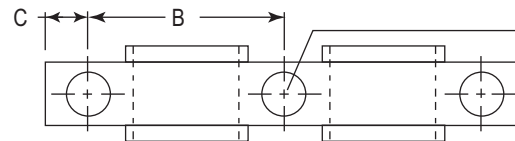
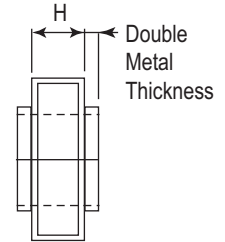
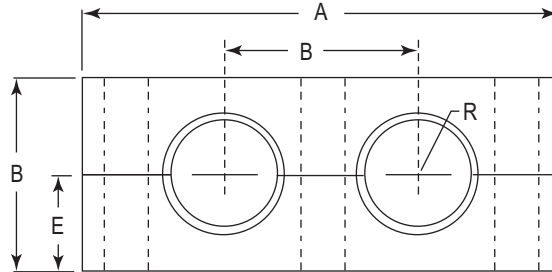
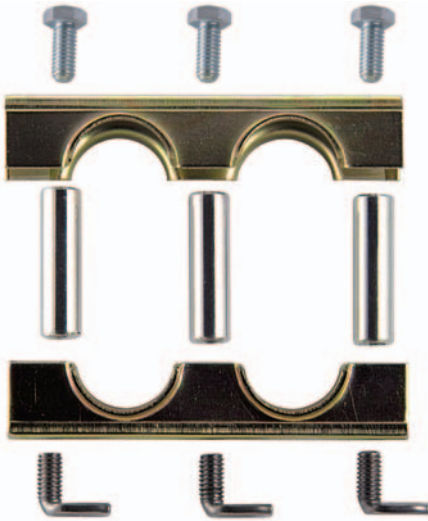
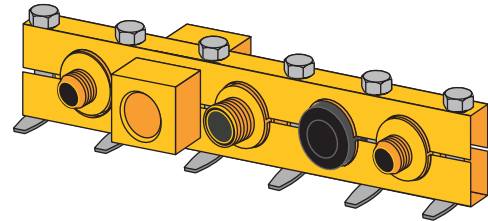


## Z-CLAMP

### OUTSIDE HOLE CLAMP UNITS

- Stackable for space conservation
- Maintains consistent center line dimensions between lines both horizontally and vertically (in a stacking application)
- Mix and match pipe, tube, hose and junction adapters
- Suited for all types of hydraulic applications
- Available in standard and outside hole mounting configurations

**INSTALLATION** - Refer to page 117 for complete installation guide.



G (Bolt Holes, Between Holes and at Each End)

**Note:** Adapters and Hardware are ordered separately. Please see pages 53-55 for selection of these items.

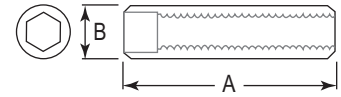


Part No.	# Adapter Holes	# Bolts	A	B	C	E	G	H	R
<b>HAC-1 Series 1-1/2"</b>									
HAC 1-1-2	1	2	2.188"	1.5"	0.344"	0.75"	0.344"	0.550"	0.422"
HAC 1-2-3	2	3	3.797"	1.5"	0.391"	0.75"	0.344"	0.550"	0.422"
HAC 1-3-4	3	4	5.297"	1.5"	0.391"	0.75"	0.344"	0.550"	0.422"
HAC 1-4-5	4	5	6.797"	1.5"	0.391"	0.75"	0.344"	0.550"	0.422"
HAC 1-5-6	5	6	8.297"	1.5"	0.391"	0.75"	0.344"	0.550"	0.422"
<b>HAC-2 Series 2"</b>									
HAC-2-1-2	1	2	2.656"	2"	0.328"	1"	0.344"	0.550"	0.594"
HAC-2-2-3	2	3	4.766"	2"	0.391"	1"	0.344"	0.550"	0.594"
HAC-2-3-4	3	4	6.797"	2"	0.391"	1"	0.344"	0.550"	0.594"
HAC-2-4-5	4	5	8.297"	2"	0.391"	1"	0.344"	0.550"	0.594"
<b>HAC-3 Series 3"</b>									
HAC-3-1-2	1	2	4.000"	3"	0.500"	1.5"	0.406"	0.750"	1.063"
HAC-3-2-3	2	3	6.859"	3"	0.422"	1.5"	0.406"	0.750"	1.063"
HAC-3-3-4	3	4	9.859"	3"	0.422"	1.5"	0.406"	0.750"	1.063"
HAC-3-4-5	4	5	12.859"	3"	0.422"	1.5"	0.406"	0.750"	1.063"

## Z-CLAMP

HARDWARE

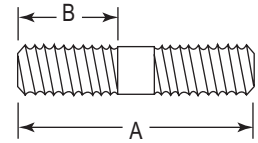
SOCKET HEAD STACKING NUT



Part No.	HAC Series	A	B Dia.	Thread size
S-1	1	1.335"	1/2"	5/16"-18
S-2	2	1.800"	1/2"	5/16"-18
S-3	3	2.780"	11/16"	3/8"

## THREAD ADAPTER

(Install or Stack)

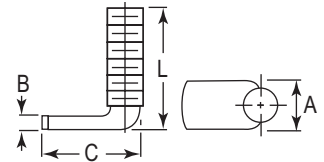


Part No.	HAC Series	A	B Dia.	Thread size
T-1	1 & 2	1.38"	0.63"	5/16"-18
T-3	3	2.00"	0.88"	3/8"-16

## WELD NUT



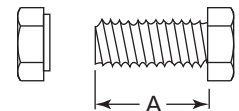
Part No.	HAC Series	Thread Size	A	B	C	L
W-1 / W-2	HAC 1&2	5/16-18	0.437	0.12	0.875	3/4
W-3	HAC 3	3/8-16	0.531	0.151	1.00	1.00



## HEX BOLT and HEX NUT



Part No.	HAC Series	Thread Size	A
HB-1	HAC 1 & 2	5/16"-18	3/4"
HB-3	HAC 3	3/8"-16	1"



## LOCK WASHER



Part No.	HAC Series	Size
HW-1	HAC 1 & 2	5/16"
HW-3	HAC 3	3/8"



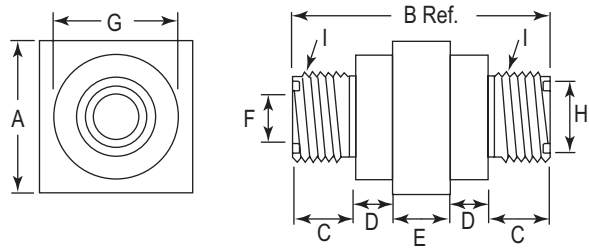
## O-RING FACE SEAL



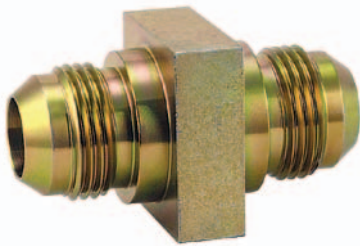
FOR USE with BETA ADAPTERS & Z-CLAMPS

Part No.	Tube Size	Dimensions – inches								
		A	B	C	D	E	F	G	I (Thread)	H
MJO-1-6	3/8"	1.00"	1.96"	0.43"	0.28"	0.54"	0.26"	0.84"	11/16"-16	0.496"
MJO-1-8	1/2"	1.00"	2.10"	0.50"	0.28"	0.54"	0.38"	0.84"	13/16"-16	0.621"
MJO-1-10	5/8"	1.00"	2.30"	0.60"	0.28"	0.54"	0.48"	0.84"	1"-14	0.748"
MJO-2-6	3/8"	1.50"	2.08"	0.43"	0.34"	0.54"	0.26"	1.20"	11/16"-16	0.496"
MJO-2-8	1/2"	1.50"	2.22"	0.50"	0.34"	0.54"	0.38"	1.20"	13/16"-16	0.621"
MJO-2-10	5/8"	1.50"	2.42"	0.60"	0.34"	0.54"	0.48"	1.20"	1"-14	0.748"
MJO-2-12	3/4"	1.50"	2.52"	0.65"	0.34"	0.54"	0.61"	1.20"	1-3/16"-12	0.873"
MJO-2-16	1"	1.50"	2.58"	0.68"	0.34"	0.54"	0.81"	1.20"	1-7/16"-12	1.058"
MJO-3-20	1-1/4"	2.25"	2.98"	0.68"	0.437"	0.75"	1.02"	2.12"	1-11/16"-12	1.309"
MJO-3-24	1-1/2"	2.25"	2.98"	0.68"	0.437"	0.75"	1.26"	2.12"	2"-12	1.621"

- Offered in a wide range of sizes in JIC, NPT, SAE, and ORFS thread configurations.
- Zinc plated to prevent corrosion
- Clamping at the fitting prevents loosening and other vibration related leaks



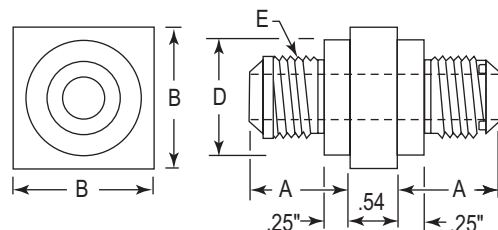
## 37° FLARE MALE JUNCTION ADAPTER



FOR USE with BETA ADAPTERS & Z-CLAMPS

Part No.	Tube Size	Dimensions – Inches			E (Thread)
		A	B	D	
<b>1-1/2" Series</b>					
MJA-1-4	1/4"	0.76"	1"	0.84"	7/16"-20
MJA-1-6	3/8"	0.76"	1"	0.84"	9/16"-18
MJA-1-8	1/2"	0.87"	1"	0.84"	3/4"-16
MJA-1-10	5/8"	0.96"	1"	0.84"	7/8"-14
<b>2" Series</b>					
MJA-2-4	1/4"	0.76"	1-1/2"	1.20"	7/16"-20
MJA-2-6	3/8"	0.76"	1-1/2"	1.20"	9/16"-18
MJA-2-8	1/2"	0.87"	1-1/2"	1.20"	3/4"-16
MJA-2-10	5/8"	0.96"	1-1/2"	1.20"	7/8"-14
MJA-2-12	3/4"	1.07"	1-1/2"	1.20"	1-1/16"-12
MJA-2-14	7/8"	1.10"	1-1/2"	1.20"	1-3/16"-12
MJA-2-16	1"	1.10"	1-1/2"	1.20"	1-5/16"-12

- Offered in a wide range of sizes in JIC, NPT, SAE, and ORFS thread configurations.
- Zinc plated to prevent corrosion
- Clamping at the fitting prevents loosening and other vibration related leaks



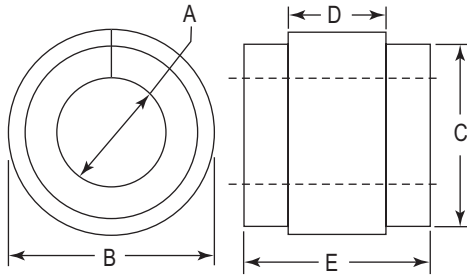
## SPLIT RUBBER BUSHINGS

FOR USE with BETA ADAPTERS & Z-CLAMPS



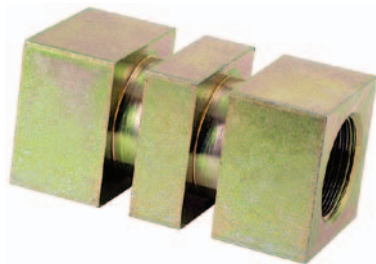
### ANTI-VIBRATION SPLIT RUBBER BUSHING

- Unique “grip” design secures cushion in place
- High quality EPDM rubber provides superior vibration damping with excellent oil resistance.



Part No.	Tube Size	Pipe Size	A	B	C	D	E
<b>HAC-1 Series 1-1/2"</b>							
G-1-4	1/4"	-	0.235"	0.975"	0.875"	0.50"	1.312"
G-1-6	3/8"	-	0.360"	0.975"	0.875"	0.50"	1.312"
G-1-8	1/2"	-	0.485"	0.975"	0.875"	0.50"	1.312"
G-1-10	5/8"	-	0.610"	0.975"	0.875"	0.50"	1.312"
G-1-12	3/4"	-	0.735"	0.975"	0.875"	0.50"	1.312"
<b>HAC-2 Series 2"</b>							
G-2-4	1/4"	-	0.235"	1.350"	1.250"	0.50"	1.312"
G-2-6	3/8"	-	0.360"	1.350"	1.250"	0.50"	1.312"
G-2-8	1/2"	-	0.485"	1.350"	1.250"	0.50"	1.312"
G-2-4P	-	1/4"	0.525"	1.350"	1.250"	0.50"	1.312"
G-2-10	5/8"	-	0.610"	1.350"	1.250"	0.50"	1.312"
G-2-6P	-	3/8"	0.660"	1.350"	1.250"	0.50"	1.312"
G-2-12	3/4"	-	0.735"	1.350"	1.250"	0.50"	1.312"
G-2-8P	-	1/2"	0.825"	1.350"	1.250"	0.50"	1.312"
G-2-14	7/8"	-	0.860"	1.350"	1.250"	0.50"	1.312"
G-2-16	1"	-	0.985"	1.350"	1.250"	0.50"	1.312"
G-2-12P	-	3/4"	1.035"	1.350"	1.250"	0.50"	1.312"
<b>HAC-3 Series 3"</b>							
G-3-4	1/4"	-	0.234"	2.287"	2.187"	0.750"	1.750"
G-3-6	3/8"	-	0.360"	2.287"	2.187"	0.750"	1.750"
G-3-8	1/2"	-	0.485"	2.287"	2.187"	0.750"	1.750"
G-3-4P	-	1/4"	0.525"	2.287"	2.187"	0.750"	1.750"
G-3-10	5/8"	-	0.610"	2.287"	2.187"	0.750"	1.750"
G-3-6P	-	3/8"	0.660"	2.287"	2.187"	0.750"	1.750"
G-3-12	3/4"	-	0.735"	2.287"	2.187"	0.750"	1.750"
G-3-8P	-	1/2"	0.825"	2.287"	2.187"	0.750"	1.750"
G-3-14	7/8"	-	0.860"	2.287"	2.187"	0.750"	1.750"
G-3-16	1"	-	0.985"	2.287"	2.187"	0.750"	1.750"
G-3-12P	-	3/4"	1.035"	2.287"	2.187"	0.750"	1.750"
G-3-20	1-1/4"	-	1.235"	2.287"	2.187"	0.750"	1.750"
G-3-16P	-	1"	1.300"	2.287"	2.187"	0.750"	1.750"
G-3-24	1-1/2"	-	1.485"	2.287"	2.187"	0.750"	1.750"
G-3-20P	-	1-1/4"	1.645"	2.287"	2.187"	0.750"	1.750"
G-3-24P	-	1-1/2"	1.885"	2.287"	2.187"	0.750"	1.750"
G-3-32	2"	-	1.985"	2.287"	2.187"	0.750"	1.750"

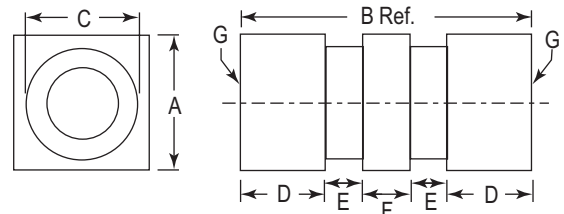
## FEMALE JUNCTION ADAPTER



For Use With Beta Adapters & Z-CLAMPS

- Offered in a wide range of sizes in JIC, NPT, SAE, and ORFS thread configurations.
- Zinc plated to prevent corrosion
- Clamping at the fitting prevents loosening and other vibration related leaks

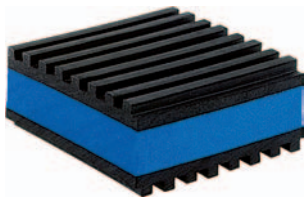
Part No.	Dimensions – Inches						G (Thread)
	A	B	C	D	E	F	
FJA-1-6-P	1"	2-13/16"	0.84"	0.84"	0.30"	0.54"	3/8" N.P.T.
FJA-2-12-P	1-1/2"	3-1/8"	1.20"	0.97"	0.32"	0.54"	3/4" N.P.T.
FJA-3-20-P	2-1/4"	2-5/8"	2.12"	0.49"	0.45"	0.74"	1-1/4" N.P.T.
FJA-1-8	1"	2-13/16"	0.84"	0.84"	0.30"	0.54"	3/4"-16 SAE
FJA-2-12	1-1/2"	3-1/8"	1.20"	0.97"	0.32"	0.54"	1-1/16"-12 SAE
FJA-3-20	2-1/4"	2-5/8"	2.12"	0.49"	0.45"	0.74"	1-5/8"-12 SAE



## GAMMA PADS

When installing pipe, tube, hose, or equipment the effects of vibration, shock, surge, galvanic corrosion and unwanted noise are a major concern. Improperly cushioned equipment, pipe, tube, or hose invites failure and potential problems. New developments in cushioned clamping and vibration isolation products from ZSi provide the proper solutions to combat these effects.

ZSi's products have earned a well-deserved reputation for unparalleled quality and effectiveness. As industry develops new needs, ZSi can and will respond with superior quality products and innovative solutions.



**EXTREME**



**STANDARD**

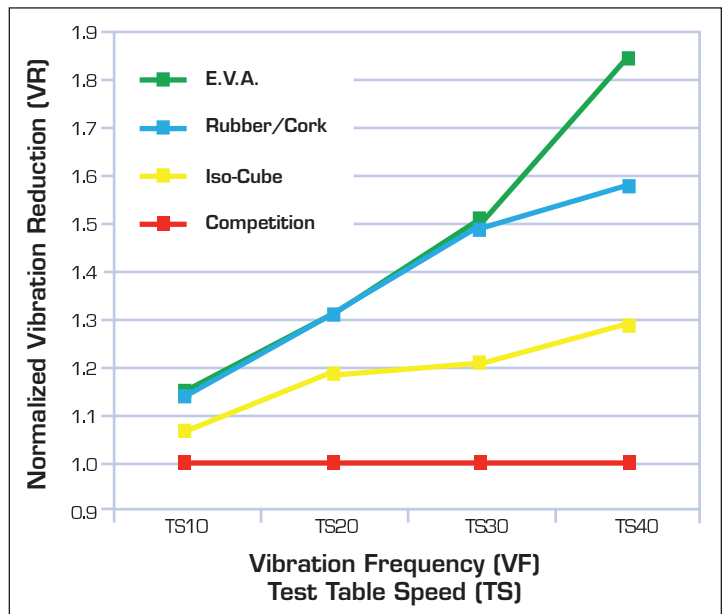


**ISO-CUBE**



**SHIELD**

**ANTI-VIBRATION PAD PERFORMANCE**





## GAMMA SHIELD

### RUBBER MAT

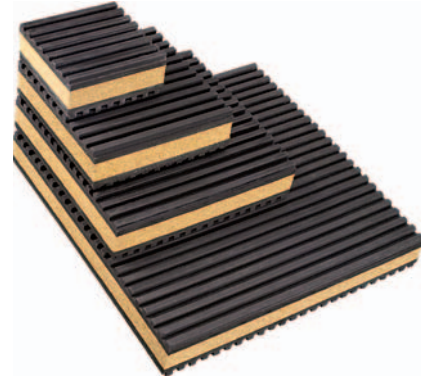
Shields equipment from vibration and movement when lesser amounts of vibration absorption is needed.



Part No.	Description
AR-2	2" x 2" x 3/8" All Rubber AV Pad
AR-3	3" x 3" x 3/8" All Rubber AV Pad
AR-4	4" x 4" x 3/8" All Rubber AV Pad
AR-6	6" x 6" x 3/8" All Rubber AV Pad
AR-18	18" x 18" x 3/8" All Rubber AV Pad

## GAMMA STANDARD PAD

The Industry Standard Highest quality elastomeric oil resistant padding. Designed to withstand 50 psi. The rubber pads are corrugated on both sides and laminated to the cork center.



Part No.	Description
AC-2	2" x 2" x 7/8" Cork / Rubber AV Pad
AC-3	3" x 3" x 7/8" Cork / Rubber AV Pad
AC-4	4" x 4" x 7/8" Cork / Rubber AV Pad
AC-6	6" x 6" x 7/8" Cork / Rubber AV Pad
AC-18	18" x 18" x 7/8" Cork / Rubber AV Pad

## ISO - CUBE

### SOLID RUBBER TOUGH

Natural rubber pads designed to reduce vibration and noise emanating from refrigeration or AC equipment. Circular design offers a suction cup effect eliminating the need to bolt the pads down. A standard 18" pad divides into eighty-one 2" segments which may be cut or torn into smaller pads. The 50 durometer pads will withstand a load of 180 psi with great resiliency.

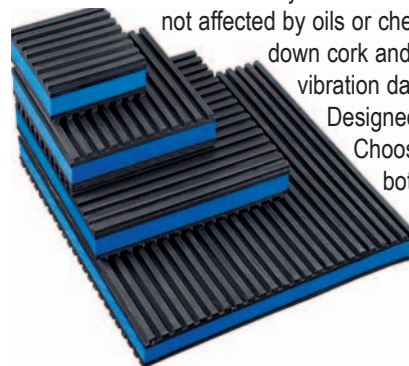


Part No.	Description
AS-2	2" x 2" x 3/4" Iso-Cube
AS-18	18" x 18" x 3/4" Iso-Cube

## GAMMA EXTREME PAD

The **BEST** Performer E.V.A. (Extreme Vibration Attenuation) is the latest generation in vibration dampening technology. In the most severe vibration extremes, testing shows the E.V.A. pad outperforms cork and rubber by greater than 3:1 and outperforms our competitor's "waffle" pad by greater than 8:1! The enhanced performance comes from the special composite foam center

which is structurally more sound than cork. E.V.A. is not affected by oils or chemicals that can break down cork and is much more effective at vibration dampening than solid rubber. Designed to withstand 50 psi. Choose E.V.A. to get the best of both worlds!



Part No.	Description
AV-2	2" x 2" x 7/8" EVA Pad
AV-3	3" x 3" x 7/8" EVA Pad
AV-4	4" x 4" x 7/8" EVA Pad
AV-6	6" x 6" x 7/8" EVA Pad
AV-18	18" x 18" x 7/8" EVA Pad



## PNEUMATIC SYSTEMS

<b>B</b> PAGE 60-61	<b>C, D</b> PAGE 62-63	<b>SV SAFETY</b> PAGE 64-66	<b>SVPC PROTECTIVE</b> PAGE 64-66	<b>INTERCHANGE PLUGS</b> PAGE 67	<b>J SOCKETS / PLUGS</b> PAGE 68	<b>L SOCKETS / PLUGS</b> PAGE 69		
Industrial Interchange					Tru-Flate		Lincoln	
<b>O SOCKETS / PLUGS</b> PAGE 70		<b>DW,U</b> PAGE 71		<b>TL SOCKETS / PLUGS</b> PAGE 72		<b>DR SOCKETS / PLUGS</b> PAGE 73		
ARO Style		Universal Coupler				Rectus 21 KA Style		

## HYDRAULIC SYSTEMS

<b>DS SOCKETS / PLUGS</b> PAGE 74-75	<b>4000 SOCKETS / PLUGS</b> PAGE 75	<b>6100 SOCKETS / PLUGS</b> PAGE 76	<b>FF SOCKETS / PLUGS</b> PAGE 77
ISO "B"	Pioneer	Wing Nut	Flat Face
<b>6600 SOCKETS / PLUGS</b> PAGE 78	<b>W SOCKETS / PLUGS</b> PAGE 79	<b>ST SOCKETS / PLUGS</b> PAGE 80	<b>H SOCKETS / PLUGS</b> PAGE 81-82
ISO "A"	Enerpac	Straight Thru	Snap-Tite

## MISCELLANEOUS

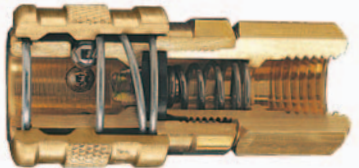


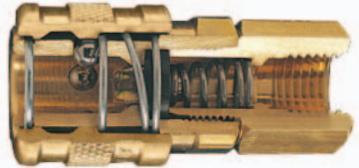
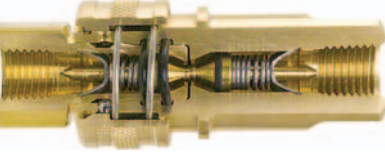
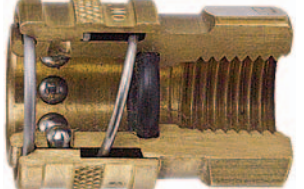
<b>INJECTION MOLD SOCKET / PLUGS</b> PAGE 83-84	<b>GARDEN HOSE SOCKETS / PLUGS</b> PAGE 85	<b>IN LINE LUBRICATOR</b> PAGE 85	<b>HOSE BARB - PAGE 86</b>		<b>BLOW GUNS &amp; TIPS</b> PAGE 91-92
			<b>STANDARD</b>	<b>PUSH LOCK</b>	
Mold Mate					
<b>PIPE FITTINGS</b>		<b>DRAIN COCKS</b> PAGE 90	<b>SWIVEL FITTINGS</b> PAGE 90	<b>HOSE MANIFOLDS</b> PAGE 93	<b>AIR HOSES</b>
<b>BRASS</b> PAGE 87-88	<b>STEEL</b> PAGE 89	<b>REUSABLE FITTINGS</b> PAGE 87			
					<b>RECOIL</b> PAGE 94

### How to Select:

Proper coupler selection is important because of the variety of media for which they are used. All couplers consist of two basic components – a socket and a plug. The type of coupler varies by the valving arrangements in these two components.

Four basic factors should be considered to assure proper selection:

## Type - Operation - Flow - Media

<h3>Manual</h3>  <p>Manual sockets require manual retraction of the sleeve to both connect and disconnect the plug. The "BL Series" is an optional feature available on manual sockets. After connection, the sleeve is rotated locking the coupler against accidental disconnect.</p>	<h3>Automatic</h3>  <p>Automatic sockets accept the plug by simple insertion into the socket and do not require retraction of the sleeve to connect. The "SL Series" is an optional feature on automatic sockets to prevent accidental disconnect. It is functionally the same as the "BL Series" on manual sockets.</p>	<h3>Safety Coupler</h3>  <p>Safety sockets are a variation of automatic operation. The socket accepts the plug by insertion. The sleeve is moved straight forward to lock and turn on the air. The sleeve is moved back by rotating first to the left and then to the right. This shuts off the supply line, exhausts the downstream line, and then releases the plug.</p>
<h3>One Way Shut-Off</h3>  <p>In a "One Way Shut-Off," only the socket has valving to shut off the flow when disconnected; it is, therefore, installed on the pressure side of the line. The plug has no valving and exhausts the downstream line at disconnect.</p>	<h3>Two Way Shut-Off</h3>  <p>The "Two Way Shut-Off" provides valving in both the socket and the plug, thereby shutting off flow at both of the disconnected ends. Originally developed for hydraulic lines, they are suitable for many other media because of the variety of metals and seal compounds offered.</p>	<h3>Straight-Thru</h3>  <p>"Straight-Thru" couplers, as the name implies, do not have valving in either the socket or the plug. Therefore, both ends of the line are exhausted at disconnect.</p>

**Operation:** Operation refers to the action required to connect and disconnect a coupler. Operation is a function of sockets only and does not vary for plugs.

**Flow:** The most important factor in properly sizing couplers is flow. Flow data is given throughout the catalog for industrial interchange design couplers, as well as many of BRECO's interchanges for competitors' non-standard designs. Where flow information is not shown, it is the same as the originating competitors' non-standard design. Most One Way Shut-Off non-standard couplers have the same flow as the same basic size industrial interchange design. All flows shown are for FPT couplers.

**Media:** The media flowing through the coupler will usually determine the type. Compressed air, many other gasses, and some liquids can be handled by One Way Shut-Off couplers. Hydraulic fluids as well as many other liquids and some gasses require Two Way Shut-Off. Straight-Thru couplers are suitable where there is no pressure in the line at connect or disconnect and loss of media at disconnect does not matter.



# "B" Series Sockets



BRECO "B" Series couplers are designed for rigid mounting that allows a simple push-to-connect operation, constructed of a solid brass body and a steel valve. The "B" Series are mechanically interchangeable with the "C" , "SV", "SVPC" & "D" Series, and similar industrial interchange couplings made by other manufacturers and accept plugs that conform to MIL-C4109-F. Plugs used with the "B" Series are the Industrial Interchange plugs that are found on page 67 of this catalog.

### Sleeve-Lock Option (shown on right)



Sleeve-Lock feature locks manual socket against accidental disconnect. To connect, align ball with slot. After connection, rotate sleeve to lock. To disconnect, realign ball with slot and retract sleeve. Sizes available with sleeve lock are shown in the tables on following pages.

### Specifications:

	BODY SIZE			
	1/4"	3/8"	1/2"	3/4"
Rated Pressure (psi)	300			
Temperature Range (std seals)	-40° to +250° F			
Locking Device	3 pawls	4 pawls	5 pawls	6 pawls
Vacuum Data				
-- Disconnected (coupler only)	Not Recommended			
-- Connected	27.4 inches Hg			

### Specifications

**Material:** Brass body and sleeve

**Seal:** Buna-N

**Working Pressure:** 300 PSIG; vacuum to 26"Hg

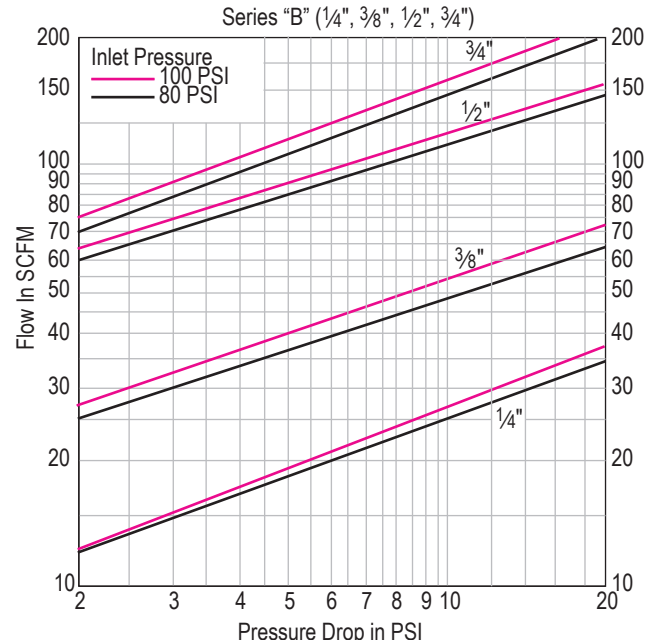
**Connection Sizes:** 1/8" to 1" NPT


1/4" to 1" Hose Barb


1/4" to 1/2" Push-on Hose Barb


**Interchangeability:** Complies with A-A-59439, ANSI/NFPA T3.20.14-1990 & ISO 6150-B


### Performance:




FEMALE THREAD		SIZE	AUTOMATIC	SLEEVE LOCK	THD SIZE NPT		
		1/4"	B-2BF1-B	B-2BF1-B-SL	1/8-27	3/8"	B-3BF2-B
B-2BF2-B	B-2BF2-B-SL		1/4-18	B-3BF3-B	B-3BF3-B-SL		3/8-18
B-2BF3-B	B-2BF3-B-SL		3/8-18	B-3BF4-B	B-3BF4-B-SL		1/2-14
1/2"	B-4BF2-B	B-4BF2-B-SL	1/4-18	3/4"	B-6BF4-B	B-6BF4-B-SL	1/2-14
	B-4BF3-B	B-4BF3-B-SL	3/8-18		B-6BF6-B	B-6BF6-B-SL	3/4-14
	B-4BF4-B	B-4BF4-B-SL	1/2-14		B-6BF8-B	B-6BF8-B-SL	1-11 1/2
	B-4BF6-B	B-4BF6-B-SL	3/4-14				

STANDARD HOSE BARB		SIZE	AUTOMATIC	SLEEVE LOCK	HOSE I.D.		
		1/4"	B-2BS2-B	B-2BS2-B-SL	1/4"	3/8"	B-3BS2-B
B-2BS5-B	B-2BS5-B-SL		5/16"	B-3BS5-B	B-3BS5-B-SL		5/16"
B-2BS3-B	B-2BS3-B-SL		3/8"	B-3BS3-B	B-3BS3-B-SL		3/8"
1/2"	B-4BS2-B	B-4BS2-B-SL	1/4"	3/4"	B-6BS4-B	B-6BS4-B-SL	1/2"
	B-4BS3-B	B-4BS3-B-SL	3/8"		B-6BS6-B	B-6BS6-B-SL	3/4"
	B-4BS4-B	B-4BS4-B-SL	1/2"		B-6BS8-B	B-6BS8-B-SL	1"
	B-4BS6-B	B-4BS6-B-SL	3/4"				

MALE THREAD		SIZE	AUTOMATIC	SLEEVE LOCK	THD SIZE NPT		
		1/4"	B-2BM1-B	B-2BM1-B-SL	1/8-27	3/8"	B-3BM2-B
B-2BM2-B	B-2BM2-B-SL		1/4-18	B-3BM3-B	B-3BM3-B-SL		3/8-18
B-2BM3-B	B-2BM3-B-SL		3/8-18	B-3BM4-B	B-3BM4-B-SL		1/2-14
1/2"	B-4BM2-B	B-4BM2-B-SL	1/4-18	3/4"	B-6BM4-B	B-6BM4-B-SL	1/2-14
	B-4BM3-B	B-4BM3-B-SL	3/8-18		B-6BM6-B	B-6BM6-B-SL	3/4-14
	B-4BM4-B	B-4BM4-B-SL	1/2-14		B-6BM8-B	B-6BM8-B-SL	1-11 1/2
	B-4BM6-B	B-4BM6-B-SL	3/4-14				

PUSH-LOCK BARB		SIZE	PART No.		HOSE I.D.		
			AUTOMATIC	SLEEVE LOCK			
1/4"	B-2BPS2-B	B-2BPS2-B-SL	1/4"	3/8"	B-3BPS3-B	B-3BPS3-B-SL	3/8"
	B-2BPS3-B	B-2BPS3-B-SL	3/8"		B-3BPS4-B	B-3BPS4-B-SL	1/2"
	B-4BPS4-B	B-4BPS4-B-SL	1/2"				

REUSEABLE HOSE FITTINGS		SIZE	PART No.		HOSE	
			BRASS	SLEEVE LOCK	I.D.	O.D.
1/4"	B-2BE2-B	-	1/4"	3/8"	1/2"	9/16"
	B-2BG2-B	-				
	B-2BH2-B	B-2BH2-B-SL				
3/8"	B-3BH3-B	B-3BH3-B-SL	3/8"	3/8"	5/8"	11/16"
	B-3BK3-B	B-3BK3-B-SL				

Pneumatic Systems	B
	C, D
Hydraulic Systems	SV, SVPC, Int Plugs
	J, L
Miscellaneous	O, DW, U
	TL, DR
Pipe Fittings	DS, 4000
	6100, FF
Blow Guns	6600, W
Air Line Products	ST, H
	Mold
Hose, Safety	Garden, Lubricator

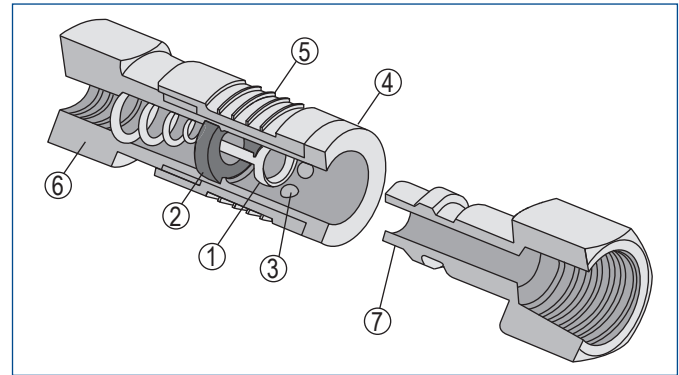


# "C", "D" Series Sockets



## Features:

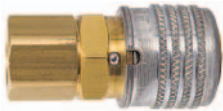
1. High flow metal valves.
2. Precision molded seals form a "bubble tight" seal for reliable operation within rated working pressures. Nitrile (Buna-N) seals are standard. Ethylene Propylene, Viton and Neoprene seals are available as options with the "D" series.
3. Proven ball locking mechanism with large numbers of hardened steel or stainless steel locking balls evenly distribute the load to resist wear and provide positive connections and allows a swiveling action to reduce hose torque.
4. Integral sleeve guard protects the sleeve and resists accidental disconnects for the "C" series.
5. Knurling and/or grooves on the sleeve provide a gripping surface for ease of operation.
6. Wide range of body sizes, materials, options and end terminations are available to meet specific needs.
7. Accepts Industrial Interchange Plug.



## Operation:

Sleeve type couplings are widely used to connect air and low pressure fluid lines. Their compact and economical design uses a ball locking mechanism consisting of captive steel balls that engage the locking groove on the mating plug. The sliding spring loaded sleeve on the socket must be manually retracted in order to connect or disconnect the plug.

## Performance:



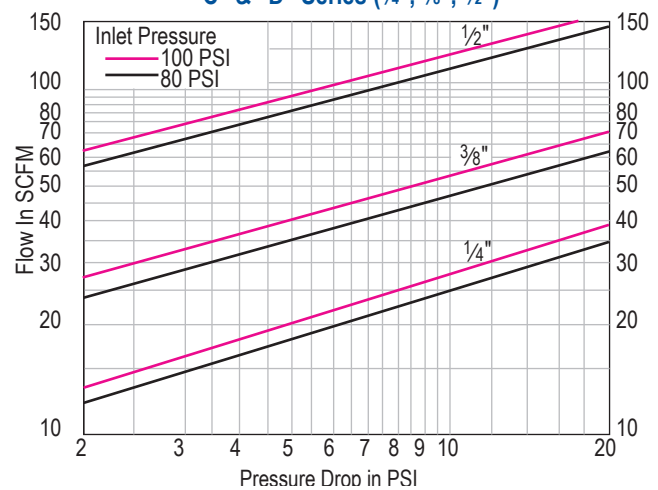
## "D" Series Options:

Sleeve-Lock feature locks manual socket against accidental disconnect. Sizes available with sleeve-lock are shown in tables on following page.

## Specifications:

	BODY SIZE		
	1/4"	3/8"	1/2"
Rated Pressure (psi)	300	300	300
Temp. Range (Buna-N Seal)	-40° to +250° F		
Locking Device	Steel Balls		
Vacuum Data (inches Hg)			
-- Disconnected (coupler only)	Not Recommended		
-- Connected	27.4	27.4	27.4
Approximate CFM at 100 (psi)	37	70	150

### "C" & "D" Series (1/4", 3/8", 1/2")



Material: Brass body and socket end, zinc-plated steel sleeve  
 Working Pressure: 300 PSIG; vacuum to 26"Hg  
 Interchangeability: Complies with ANSI/NFPA T3.20.14-1990 & ISO 6150-B

FEMALE PIPE THREAD	BODY SIZE	THD OR HOSE SIZE	"C" SERIES		BODY SIZE	THD OR HOSE SIZE	"D" SERIES	
			BRASS W/ BRASS SLEEVE	STEEL (-S) STAINLESS (-SS)			BRASS W/ STEEL SLEEVE	BRASS W/STEEL SLEEVE SLEEVE LOCK
	1/4"	1/8-27	B-2CF1-B	-	1/4"	1/8-27	D320	D320BL
		1/4-18	B-2CF2-B	B-2CF2-SS		1/4-18	D340	D340BL
		3/8-18	B-2CF3-B	-		3/8-18	D360	D360BL
	3/8"	1/4-18	-	B-3CF2-S	1/4-18	D440	D440BL	
		3/8-18	B-3CF3-B	B-3CF3-S	3/8-18	D460	D460BL	
		1/2-14	-	B-3CF4-S	1/2-14	D480	D480BL	
1/2"	1/4-18	-	-	1/4-18	D540	D540BL		
	3/8-18	-	B-4CF3-S	3/8-18	D560	D560BL		
	1/2-14	B-4CF4-B	B-4CF4-S	1/2-14	D580	D580BL		
	3/4-14	-	B-4CF6-S	3/4-14	D5120	D5120BL		



Notes: Plugs for use with "C" & "D" Series sockets are shown on page 67.

MALE THREAD	BODY SIZE	THD OR HOSE SIZE	"C" SERIES		BODY SIZE	THD OR HOSE SIZE	"D" SERIES		
			BRASS W/ BRASS SLEEVE	STEEL (-S) STAINLESS -(SS)			BRASS W/ STEEL SLEEVE	BRASS W/STEEL SLEEVE SLEEVE LOCK	
	1/4"	1/8-27	B-2CM1-B	-	1/4"	1/8-27	D321	D321BL	
		1/4-18	B-2CM2-B	B-2CM2-SS		1/4-18	D341	D341BL	
		3/8-18	B-2CM3-B	-		3/8-18	D361	D361BL	
	3/8"	1/4-18	-	B-3CM2-S	3/8"	1/4-18	D441	D441BL	
		3/8-18	B-3CM3-B	B-3CM3-S		3/8-18	D461	D461BL	
		1/2-14	-	B-3CM4-S		1/2-14	D481	D481BL	
	1/2"	1/4-18	-	-	1/2"	1/4-18	D541	D541BL	
		3/8-18	-	B-4CM3-S		3/8-18	D561	D561BL	
		1/2-14	B-4CM4-B	B-4CM4-S		1/2-14	D581	D581BL	
			B-4CM6-S				3/4-14	D5121	D5121BL

STANDARD HOSE BARB	BODY SIZE	THD OR HOSE SIZE	"C" SERIES		BODY SIZE	THD OR HOSE SIZE	"D" SERIES		
			BRASS W/ BRASS SLEEVE	STEEL (-S) STAINLESS -(SS)			BRASS W/ STEEL SLEEVE	BRASS W/STEEL SLEEVE SLEEVE LOCK	
	1/4"	1/4"	B-2CS2-B	-	1/4"	1/4"	D342	D342BL	
		5/16"	B-2CS25-B	-		5/16"	D352	D352BL	
		3/8"	B-2CS3-B	-		3/8"	D362	D362BL	
	3/8"	1/4"	-	-	3/8"	1/4"	D442	D442BL	
		5/16"	-	-		5/16"	D452	D452BL	
		3/8"	-	B-3CS3-S		3/8"	D462	D462BL	
	1/2"	1/2"	-	B-3CS4-S	1/2"	1/2"	D482	D482BL	
		1/4"	-	-		1/4"	D542	D542BL	
		3/8"	-	B-4CS3-S		3/8"	D562	D562BL	
			B-4CS4-S				1/2"	D582	D582BL
			B-4CS6-S				3/4"	D5122	D5122BL

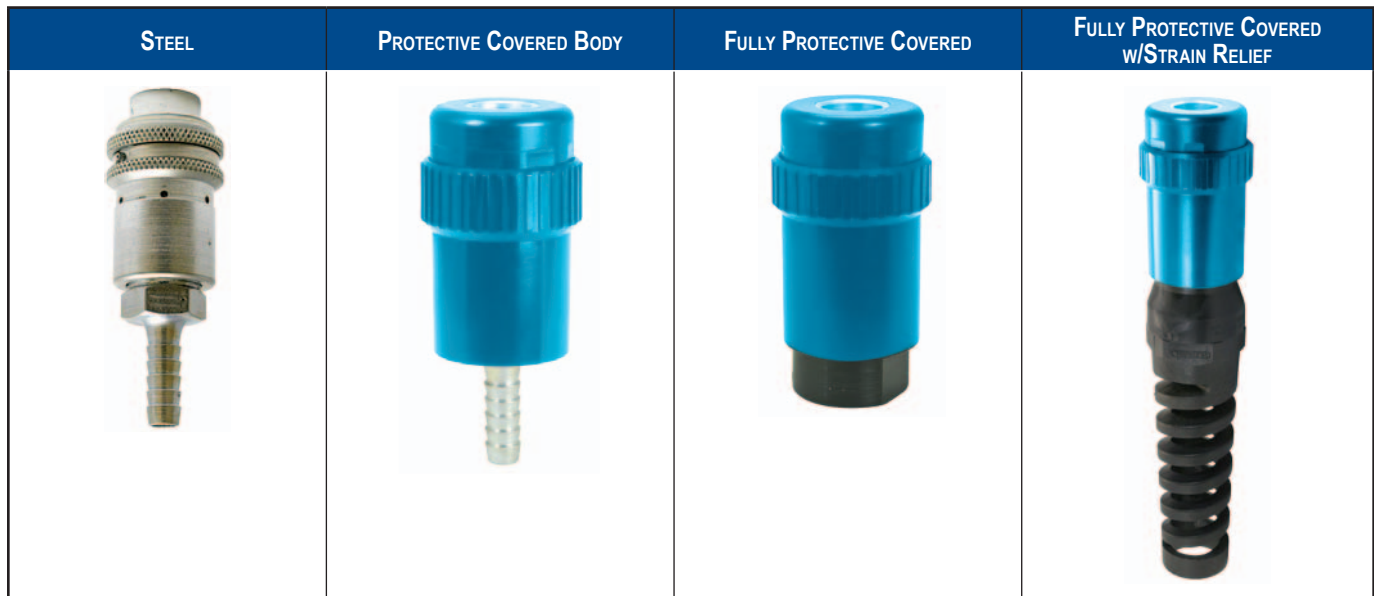
PUSH-LOCK BARB	BODY SIZE	THD OR HOSE SIZE	"C" SERIES		BODY SIZE	THD OR HOSE SIZE	"D" SERIES	
			BRASS W/ BRASS SLEEVE	STEEL (-S) STAINLESS -(SS)			BRASS W/ STEEL SLEEVE	BRASS W/STEEL SLEEVE SLEEVE LOCK
	1/4"	1/4"	B-2CPS2-B	-	1/4"	1/4"	D344	D344BL
		3/8"	B-2CPS3-B	-		3/8"	D364	D364BL
	3/8"	3/8"	-	B-3CPS3-S	3/8"	3/8"	D464	D464BL
		3/8"	-	B-4CPS3-S		1/2"	D484	D484BL
	1/2"	1/2"	-	B-4CPS4-S	1/2"	1/2"	D584	D584BL

REUSEABLE HOSE FITTINGS	BODY SIZE	THREAD SIZE OR HOSE SIZE	BRASS W/BRASS SLEEVE
	1/4"	1/2"	B-2CE2-B
	1/4"	9/16"	B-2CG2-B
	1/4"	5/8"	B-2CH2-B
	3/8"	5/8"	B-2CH3-B
	3/8"	1 1/16"	B-2CK3-B

B  
 C, D  
 Pneumatic Systems  
 SV, SVPC, Int Plugs  
 J, L  
 O, DW, U  
 TL, DR  
 Hydraulic Systems  
 DS, 4000  
 6100, FF  
 6600, W  
 ST, H  
 Mold  
 Garden, Lubricator  
 Pipe Fittings  
 Miscellaneous  
 Blow Guns  
 Air Line Products  
 Hose, Safety



## Safety Vent - Zero Pressure Connect and Disconnect Design



BRECO SV and SVPC Series Safety Vent couplings are designed for maximum user and equipment safety. BRECO SV and SVPC Series couplings allow for safe and easy connection/disconnection under zero line pressure to minimize the possibility of inadvertent disconnection and potential hose whip.

The fully encapsulated non-marring models significantly reduce the risk of surface nicks and scratches. Ideal for use in paint booth applications or for air lines used around finished surfaces, such as fiberglass, painted metal or glass surfaces.

### Features:

- Made in the USA
- Rubber or polyurethane hose connections available
- Extra thick heat-treated steel walls extend service life
- Zero pressure connect/disconnect design vents down stream pressure for safe, easy connect/disconnect. It also minimizes possible inadvertent disconnection and potentially dangerous hose whip
- "O-ring" plug seal for leak-free performance
- No replacement parts used (valve, spring, or washer) that could block flow of air.
- Silicone-free assembly.
- Meets ISO 4414, 9.6 Quick-Action Couplings requirements: Quick-Action (quick release) couplings shall be selected so that when they are coupled or uncoupled
  - a) the coupling shall not be forced apart in a hazardous manner
  - b) compressed air particles shall not be expelled in a hazardous manner
  - c) a controlled pressure-release system shall be provided where a hazard may exist.

### Specifications

**Material:** Zinc-plated steel, Acetal Copolymer outside cover, Steel internals

**Seal:** Buna-N

**Working Pressure:** 300 PSIG; vacuum to 26"Hg

**Body Sizes:** 1/4" to 3/4" Industrial Interchange Design

**Connection Sizes:** 1/4" to 1" NPT; 1/4" to 3/4" Hose Barb

**Interchangeability:** Complies with ANSI/NFPA T3.20.14-1990, ISO 6150-B, & ISO 4414

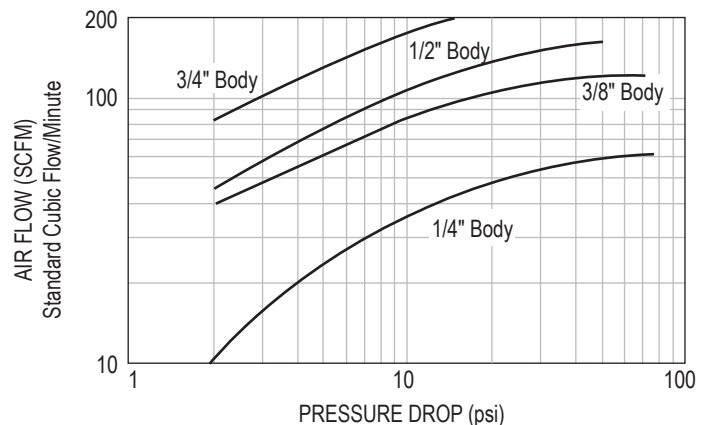
**Rated Pressure:** 300 psi

**Temperature Range (std seals):** 0° to +150° F

**Locking Device:** Steel Balls

**Force required to Connect:** Less than 10 lbs

**Performance – "SV", "SVPC" Series (1/4", 3/8", 1/2", 3/4") Pressure Drop/Flow Performance Curves @100 PSIG Inlet**





**INSERT PLUG – OUTPUT IS ZERO PRESSURE**

1 Make sure sleeve is fully retracted to allow insertion of the plug. Output pressure is zero at this point.

**PLUG IS LOCKED IN PLACE, NOW RESTORE OUTPUT PRESSURE**

2 Make sure sleeve is fully extended to allow pressure on the output plug

**SYSTEM UNDER PRESSURE (BOTH SOURCE AND OUTPUT)**

3

**REMOVE PRESSURE FROM OUTPUT -- ACTS AS A SHUT-OFF VALVE --**

4 Output Pressure is Released

Vent Holes release pressure to eliminate "Hose Whip", and make the coupler "Self Cleaning"

**REMOVE PLUG – OUTPUT PRESSURE IS AUTOMATICALLY ZERO**

5 Since output pressure is zero, and coupler is in release position, Plug can be removed

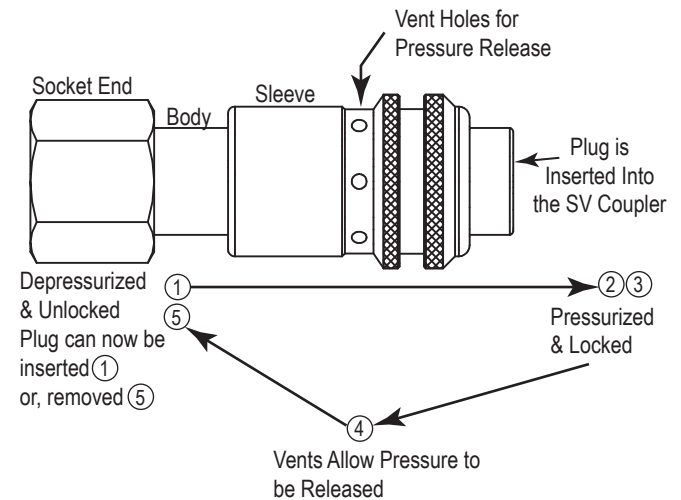
**Operation:**

SV and SVPC Series Safety Vent couplers are nearly effortless to connect and great for hose use. They are also especially useful for single-hand operation when they are mounted to hard lines such as an overhead air drop.

Once inserted into the SV or SVPC socket, the plug is lightly gripped and will stay in place allowing the operator to use the same hand to slide the sleeve straight forward to the "on" position.

SV or SVPC Series sockets can also be used as a 3-way valve to turn off the flow of air and exhaust the downstream pressure without disengaging the plug. By turning and sliding the sleeve to the "exhaust" position, downstream air pressure is relieved but the plug remains locked in place. Turning and sliding the sleeve in the opposite direction allows air to flow again.

BRECO SV or SVPC Series couplers are the ultimate solution to accidental disconnect hose whip dangers.






Pneumatic Systems	B
	C, D
Hydraulic Systems	J, L
	O, DW, U
Miscellaneous	TL, DR
	DS, 4000
Pipe Fittings	6100, FF
	6600, W
Blow Guns	ST, H
	Mold
Air Line Products	Garden, Lubricator
	Blow Guns
Hose, Safety	Pipe Fittings
	Air Line Products



# "SV" & "SVPC" Series [Safety Vent, Industrial Interchange]



FEMALE PIPE THREAD	BODY	SIZE	PART No. / STEEL	SIZE	PART No. / BODY PROTECTIVE COVERED	SIZE	PART No. / FULLY PROTECTIVE COVERED
	1/4"	1/4"	SV3003	1/4"	SVPC3003	1/4"	-
	1/4"	3/8"	SV3203	3/8"	SVPC3203	3/8"	-
	3/8"	1/4"	SV4004	1/4"	SVPC4004	1/4"	-
	3/8"	3/8"	SV4204	3/8"	SVPC4204	3/8"	SVPCA60
	3/8"	1/2"	SV4404	1/2"	SVPC4404	1/2"	SVPCA80
	1/2"	3/8"	SV5005	3/8"	SVPC5005	3/8"	-
	1/2"	1/2"	SV5205	1/2"	SVPC5205	1/2"	SVPC280
	1/2"	3/4"	SV5405	3/4"	SVPC5405	3/4"	SVPC2120
	3/4"	3/4"	SV6406	3/4"	SVPC6406	3/4"	-
3/4"	1"	SV6606	1"	-	1"	-	



3/8" Body      1/2" Body

MALE PIPE THREAD	BODY	SIZE	PART No. / STEEL	SIZE	PART No. / BODY PROTECTIVE COVERED
	1/4"	1/4"	SV3103	1/4"	SVPC3103
	1/4"	3/8"	SV3303	3/8"	SVPC3303
	3/8"	1/4"	SV4104	1/4"	SVPC4104
	3/8"	3/8"	SV4304	3/8"	SVPC4304
	3/8"	1/2"	SV4504	1/2"	SVPC4504
	1/2"	3/8"	SV5105	3/8"	SVPC5105
	1/2"	1/2"	SV5305	1/2"	SVPC5305
	1/2"	3/4"	SV5505	3/4"	SVPC5505
	3/4"	3/4"	SV6506	3/4"	SVPC6506
3/4"	1"	SV6706	1"	SVPC6706	






PUSH-ON HOSE STEM	BODY	SIZE	PART No. / STEEL	SIZE	PART No. / BODY PROTECTIVE COVERED
	1/4"	1/4"	SV1513	1/4"	SVPC1513
	1/4"	3/8"	SV1713	3/8"	SVPC1713
	3/8"	3/8"	SV1714	3/8"	SVPC1714
	3/8"	1/2"	SV1814	1/2"	SVPC1814
	1/2"	1/2"	SV1815	1/2"	SVPC1815




HOSE BARB (REQUIRES HOSE CLAMP)	BODY	SIZE	PART No.	STEEL	SIZE	PART No.	BODY PROTECTIVE COVERED
	1/4"	1/4"	SV3603		1/4"	SVPC3603	
	1/4"	3/8"	SV3703		3/8"	SVPC3703	
	1/2"	3/8"	SV5705		3/8"	SVPC5705	
	1/2"	1/2"	SV5805		1/2"	SVPC5805	
	1/2"	3/4"	SV5905		3/4"	SVPC5905	
	3/8"	1/4"	SV4604		1/4"	SVPC4604	
	3/8"	3/8"	SV4804		3/8"	SVPC4804	
	3/8"	1/2"	SV4904		1/2"	SVPC4904	
	3/4"	3/4"	SV6906		3/4"	SVPC6906	

HOSE BARB (REQUIRES HOSE CLAMP)	BODY	SIZE	PART No.	FULLY PROTECTIVE COVERED, w/STRAIN RELIEF	SIZE	PART No.	FULLY PROTECTIVE COVERED, w/o STRAIN RELIEF
	3/8"	3/8"	SVPCA66.R		3/8"	SVPCA62.R	
	3/8"	3/8"	SVPCA66.P		3/8"	SVPCA62.P	
	3/8"	7/16"	SVPCA76.P		7/16"	SVPCA72.P	
	3/8"	1/2"	SVPCA86		1/2"	SVPCA82	
	1/2"	7/16"	SVPC276.P		7/16"	SVPC272.P	
	1/2"	3/8"	SVPC266.R		3/8"	SVPC262.R	
	1/2"	3/8"	SVPC266.P		3/8"	SVPC262.P	
1/2"	1/2"	-	1/2"		SVPC282		

3/8" Body      1/2" Body      3/8" Body      1/2" Body

Note:

- All SV, SVPC Sockets feature a Silicone-free assembly.
- ".P" part number - Poly Hose
- ".R" part number - Rubber Hose
- SVPCA82, SVPCA86 can be used with either Rubber or Poly Hose
- Part numbers ending in "6" have strain relief as shown

BRECO Industrial Interchange plugs mate with sockets which conform to MIL -C4109-F. They are for use with any BRECO "B", "C", "D", "SV", "DM" & "SVPC" Series sockets. The industrial Interchange Plugs are completely interchangeable with similar plugs manufactured by other quick coupling manufacturers conforming to MIL-C4109-F requirements.

Hardened wear points (*Steel plugs only*) and solid barstock construction provide long service life. Precision machined surfaces and hardened load bearing areas resist the efforts of mechanical shock in the most rugged applications.

"B" SERIES PLUGS FEMALE PIPE	PART No. BRASS		SIZE	THREAD SIZE
	B-B2F2-B	1/4"	1/4"	1/4"-18
	B-B3F3-B	3/8"	3/8"	3/8"-18
	B-B4F4-B	1/2"	1/2"	1/2"-14
	PART No. STEEL (S) STAINLESS (SS)		SIZE	THREAD SIZE
	B-B2F1-S	1/4"	1/8"	27
	B-B2F2-S		1/4"	18
	B-B2F2-SS		1/4"	18
	B-B2F3-S	3/8"	3/8"	18
	B-B3F2-S		1/4"	18
	B-B3F3-S		3/8"	18
	B-B3F4-S	1/2"	1/2"	14
	B-B4F2-S		1/4"	18
	B-B4F3-S		3/8"	18
	B-B4F4-S	1/2"	1/2"	14
B-B4F6-S	3/4"		14	
B-B6F4-S	1/2"		14	
B-B6F6-S	3/4"	3/4"	14	
B-B6F8-S		1-11/2"		



"B" SERIES PLUGS HOSE BARB	PART No. STEEL	SIZE	HOSE "ID"
	B-B2S2-S	1/4"	1/4"
	B-B2S25-S		5/16"
	B-B2S3-S		3/8"
	B-B3S2-S	3/8"	1/4"
	B-B3S3-S		3/8"
	B-B3S4-S		1/2"
	B-B4S3-S	1/2"	3/8"
	B-B4S4-S		1/2"
	B-B4S6-S		3/4"
	B-B6S4-S	3/4"	1/2"
	B-B6S6-S		3/4"
	B-B6S8-S		1



"B" SERIES PLUGS MALE PIPE	PART No. BRASS		SIZE	THREAD SIZE
	B-B2M2-B	1/4"	1/4"	1/4"-18
	B-B3M3-B	3/8"	3/8"	3/8"-18
	B-B4M4-B	1/2"	1/2"	1/2"-14
	B-B6M6-B	3/4"	3/4"	3/4"-14
	PART No. STEEL STAINLESS (SS)		SIZE	THREAD SIZE
	B-B2M1-S	1/4"	1/8"	27
	B-B2M2-S		1/4"	18
	B-B2M2-SS		1/4"	18
	B-B2M3-S	3/8"	3/8"	18
	P421.A		1/8"	27
	B-B3M2-S		1/4"	18
	B-B3M3-S	1/2"	3/8"	18
	B-B3M4-S		1/2"	14
	B-B4M2-S		1/4"	18
	B-B4M3-S	3/4"	3/8"	18
	B-B4M4-S		1/2"	14
	B-B4M6-S		3/4"	14
	B-B6M4-S	1/2"	1/2"	14
	B-B6M6-S		3/4"	14
	B-B6M8-S		1-11/2"	
	BALL CHECK PLUG PART No.		SIZE	THREAD SIZE
	P341G	1/4"	1/4" x 1/4"	
	P361G	1/4"	1/4" x 3/8"	
	P581G	1/2"	1/2" x 1/2"	



"B" SERIES PLUGS PUSH-LOCK BARB	PART No. STEEL	SIZE	HOSE "ID"
	B-B2PS2-S	1/4"	1/4"
	B-B2PS3-S		3/8"
	B-B3PS2-S	3/8"	1/4"
	B-B3PS3-S		3/8"
	B-B3PS4-S		1/2"
	B-B4PS3-S	1/2"	3/8"
	B-B4PS4-S		1/2"



"B" SERIES PLUGS RE-USABLE	PART No. STEEL	SIZE ID	SIZE OD
	B-B2E2-S	1/4"	1/2"
	B-B2H2-S	1/4"	5/8"
	B-B2H3-S	3/8"	5/8"
B-B2K3-S	3/8"	11/16"	





Pneumatic Systems	B
SV, SVPC, Int Plugs	C, D
J.L	
O.D.W, U	
TL, DR	
Hydraulic Systems	
DS, 4000	
6100, FF	
6600, W	
ST. H	
Mold	
Miscellaneous	
Garden, Lubricator	
Pipe Fittings	
Blow Guns	
Air Line Products	
Hose, Safety	





# "J" Series Sockets & Plugs [INTERCHANGE WITH TRU-FLATE DESIGN]





FEMALE THREAD		SIZE	PART No. BRASS	PART No. STEEL	THREAD SIZE
		1/4"	B-2JF1-B	-	1/8-27
			B-2JF2-B	-	1/4-18
			B-2JF3-B	-	3/8-18
		3/8"	-	B-3JF2-S	1/4-18
			-	B-3JF3-S	3/8-18
			-	B-3JF4-S	1/2-14
		1/2"	-	B-4CF3-S	3/8-18
			B-4CF4-B	B-4CF4-S	1/2-14
			-	B-4CF6-S	3/4-14


FEMALE THREAD		SIZE	PART No. BRASS	PART No. STEEL	THREAD SIZE
		1/4"	-	B-J2F1-S	1/8-27
			B-J2F2-B	B-J2F2-S	1/4-18
			-	B-J2F3-S	3/8-18
		3/8"	-	B-J3F2-S	1/4-18
			-	B-J3F3-S	3/8-18
		1/2"	-	B-B4F3-S	3/8-18
			-	B-B4F4-S	1/2-14
			-	B-B4F6-S	3/4-14


MALE THREAD		SIZE	PART No. BRASS	PART No. STEEL	THREAD SIZE
		1/4"	B-2JM2-B	-	1/4-18
			B-2JM3-B	-	3/8-18
		3/8"	-	B-3JM2-S	1/4-18
			-	B-3JM3-S	3/8-18
			-	B-3JM4-S	1/2-14
		1/2"	-	B-4CM3-S	3/8-18
			B-4CM4-B	B-4CM4-S	1/2-14
			-	B-4CM6-S	3/4-14

MALE THREAD		SIZE	PART No. BRASS	PART No. STEEL	THREAD SIZE
		1/4"	-	B-J2M1-S	1/8-27
			B-J2M2-B	B-J2M2-S	1/4-18
			-	B-J2M3-S	3/8-18
		3/8"	-	B-J3M2-S	1/4-18
			-	B-J3M3-S	3/8-18
			-	B-B4M3-S	3/8-18
		1/2"	-	B-B4M4-S	1/2-14
			-	B-B4M6-S	3/4-14

STANDARD HOSE BARB		SIZE	PART No. BRASS	PART No. STEEL	THREAD SIZE
		1/4"	B-2JS2-B	-	1/4"
			B-2JS3-B	-	3/8"
		3/8"	-	B-3JS3-S	3/8"
			-	B-3JS4-S	1/2"
		1/2"	-	B-4CS3-S	3/8"
			-	B-4CS4-S	1/2"
			-	B-4CS6-S	3/4"

STANDARD HOSE BARB		SIZE	PART No. STEEL	HOSE I.D.
		1/4"	B-J2S2-S	1/4"
			B-J2S3-S	3/8"
		3/8"	B-J3S3-S	3/8"
		1/2"	B-B4S3-S	3/8"
			B-B4S4-S	1/2"
			B-B4S6-S	3/4"

PUSH LOCK BARB		SIZE	PART No. BRASS	PART No. STEEL	THREAD SIZE
		1/4"	B-2JPS2-B	-	1/4"
			B-2JPS3-B	-	3/8"
		3/8"	-	B-3JPS3-S	3/8"
		1/2"	-	B-4CPS3-S	3/8"
			-	B-4CPS4-S	1/2"

PUSH-LOCK BARB		SIZE	PART No. STEEL	HOSE I.D.
		1/4"	B-J2PS2-S	1/4"
			B-J2PS3-S	3/8"
		3/8"	B-J3PS3-S	3/8"
		1/2"	B-B4PS3-S	3/8"
			B-B4PS4-S	1/2"

BRECO "L" Series couplings are interchangeable with Lincoln's "Long Stem" series couplings. They are only available in 1/4" body size, brass and steel construction.

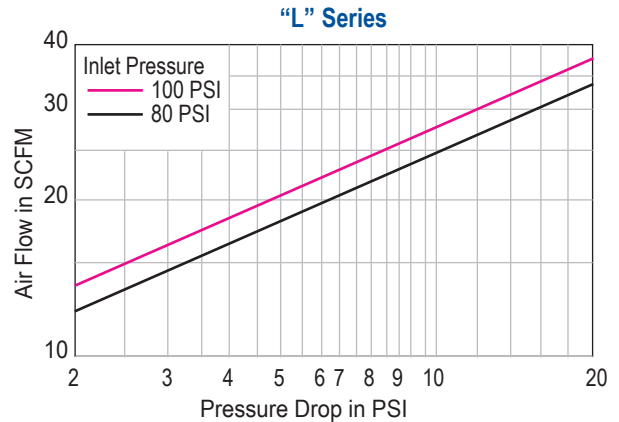
### Specifications:

Rated Pressure (psi): 300

Temperature Range (std seals): -40° to +250°F.


Locking Device: Balls or pins

### Performance:





### "L" Series Sockets

FEMALE THREAD		SIZE	PART No. BRASS	THREAD SIZE NPTF
		1/4"	B-2LF2-B	1/4-18

MALE THREAD		SIZE	PART No. BRASS	THREAD SIZE NPTF
		1/4"	B-2LM2-B	1/4-18

### "L" Series Plugs

FEMALE THREAD		SIZE	PART No. STEEL	THREAD SIZE NPTF
		1/4"	B-L2F2-S	1/4-18

MALE THREAD		SIZE	PART No. STEEL	THREAD SIZE NPTF
		1/4"	B-L2M2-S	1/4-18



# "O" Series - [INTERCHANGE WITH ARO 210]

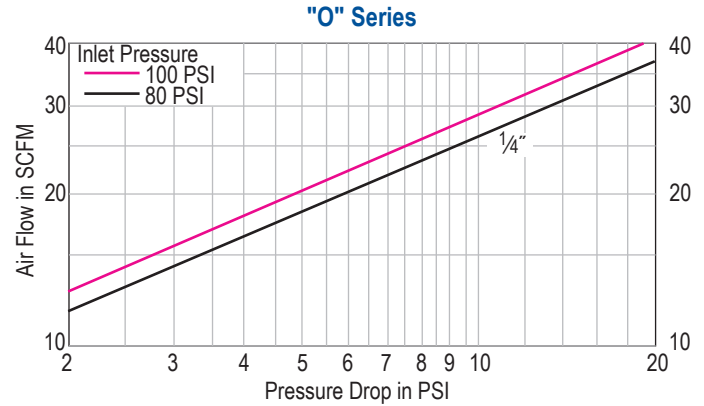


BRECO "O" Series couplings are manual to connect designs and interchange with 1/4" body size ARO 210 series plugs.

### Specifications:

- Rated Pressure: 300 psi
- Temperature Range (Buna seal): -40° to +250°F.
- Locking Device: Stainless Steel pins
- All Brass construction

### Performance:



FEMALE THREAD		SIZE	PART No. BRASS	PART No. STEEL	THD SIZE NPTF
		1/4"	B-20F2-B	-	1/4-18
			B-20F3-B	-	3/8-18
			-	B-20F2-S	1/4-18
3/8"	B-30F3-B	-	3/8-18		

MALE THREAD		SIZE	PART No. BRASS	PART No. STEEL	THD SIZE NPTF
		1/4"	B-20M2-B	-	1/4-18
			B-20M3-B	-	3/8-18
			-	B-20M2-S	1/4-18
3/8"	-	B-30M3-S	3/8-27		

STANDARD HOSE BARB		SIZE	PART No. BRASS	HOSE I.D.
		1/4"	B-20S2-B	1/4"
			B-20S3-B	3/8"

PUSH-LOCK HOSE BARB		SIZE	PART No. BRASS	HOSE I.D.
		1/4"	B-20PS2-B	1/4"
			B-20PS3-B	3/8"

*\*Push-Lock hose barbs are designed for use with Push-Lock hose and do not require clamps.*

FEMALE PIPE THREAD		SIZE	PART No. STEEL	THREAD SIZE NPTF
		1/4"	B-02F2-S	1/4-18
			B-02F3-S	3/8-18
3/8"	B-03F3-S	3/8-18		

MALE PIPE THREAD		SIZE	PART No. STEEL	THREAD SIZE NPTF
		1/4"	B-02M1-S	1/8"
			B-02M2-S	1/4-18
			B-02M3-S	3/8-18
3/8"	B-03M3-S	3/8-18		

STANDARD HOSE BARB		SIZE	PART No. STEEL	HOSE I.D.
		1/4"	B-02S2-S	1/4"
			B-02S3-S	3/8"

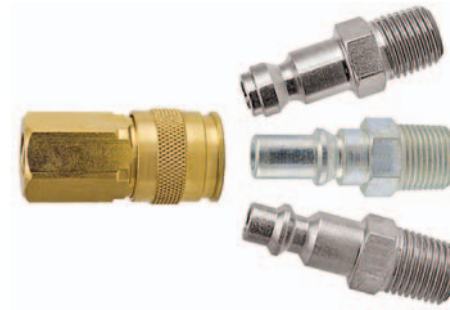
PUSH-LOCK HOSE BARB		SIZE	PART No. STEEL	HOSE I.D.
		1/4"	B-02PS2-S	1/4"



## BRECO Pneumatic Universal Coupler Accepts Multiple Series Nipples

### Features:

- The 1/4" Universal Coupler will accept the Industrial Interchange series, "J" series (Tru-Flate) & "O" Series (ARO-210) Plugs.
- The coupler features automatic push-to-connect operation, high flow machined "window valve" and a sleeve guard which helps prevent accidental disconnects and protects the sleeve from damage.
- The coupler is available with male or FPT ports.
- While the best quick coupling performance is obtained by matching like series sockets and plugs, the universal coupler permits multiple series plugs to mate with one socket.



"J" Series  
(see page 68)

"O" Series  
ARO-210  
(see page 70)

"B" Series  
(see page 61)

"U" SERIES SOCKETS FEMALE PIPE	SIZE	PART No. BRASS	PART No. STEEL	THD SIZE NPTF
	1/4"	B-2UF2-B	DW340A	1/4-18
		-	DW360A	3/8"
	3/8" *	-	DW440A	1/4-18
-		DW460A	3/8"	

"U" SERIES SOCKETS MALE PIPE	SIZE	PART No. BRASS	PART No. STEEL	THD SIZE NPTF
	1/4"	B-2UM2-B	DW341A	1/4-18
		-	DW361A	3/8"
	3/8" *	-	DW441A	1/4-18
-		DW461A	3/8"	

### Specifications:

Rated Pressure (psi): 150

Temperature Range (Nitrile seal): -40° to +250°F.

Locking Device: Steel balls

Vacuum Service: **Not Recommended**

"U" SERIES SOCKETS STD HOSE BARB	PART No. STEEL	SIZE	THREAD SIZE
	DW342A	1/4"	1/4-18
	DW362A		3/8"
	DW462A	3/8" *	3/8"

### \*Note:

3/8" size accept industrial interchange and "J" series (Tur-Flate) plugs only.



## Push to Connect/Lock... Twist to Unlock

### Features

- Engineered for speedy coupling and uncoupling.
    - To lock - push in;
    - To unlock - give the coupler unit sleeve a 1/8" turn.
  - Designed to protect against accidental uncoupling. A variety of types and sizes are available to meet specific needs.
- Standard Twist-Lock couplings are ideal for low to medium air flows, such as air tools.

### Specifications

**Rated Pressure (psi):** 250

**Temperature Range (Nitrile seal):** -10° to +165°F.

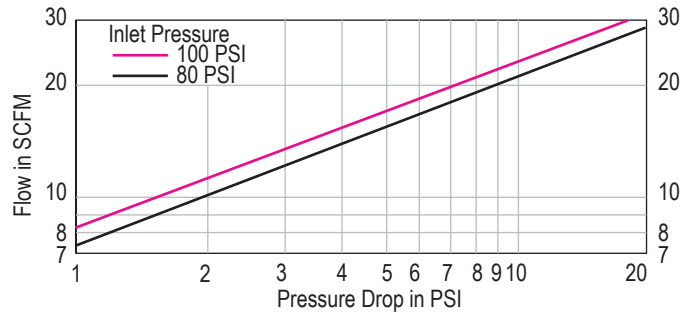
**Locking Device:** Twist-Lock

**Vacuum Service:** 27 HG

### Materials:

Aluminum bodies and zinc plated steel sleeves. Buna-N seals. Brass adapters.

### Performance:



## "TL" Series Sockets

FEMALE THREAD		SIZE	PART No.	THREAD SIZE NPT
		1/4"	B-2TLF1-S	1/8"
			B-2TLF2-S	1/4"
			B-2TLF3-S	3/8"
		1/2"	B-4TLF2-S	1/4"
			B-4TLF3-S	3/8"
			B-4TLF4-S	1/2"
				B-4TLF6-S

## "TL" Series Plugs

FEMALE THREAD		SIZE	PART No.	THREAD SIZE NPT
		1/4"	B-TL2F1-S	1/8"
			B-TL2F2-S	1/4"
		1/2"	B-TL4F2-S	1/4"
			B-TL4F3-S	3/8"

MALE THREAD		SIZE	PART No.	THREAD SIZE NPT
		1/4"	B-2TLM2-S	1/4"
			B-2TLM3-S	3/8"
		1/2"	B-4TLM2-S	1/4"
			B-4TLM3-S	3/8"
			B-4TLM4-S	1/2"

MALE THREAD		SIZE	PART No.	THREAD SIZE NPT
		1/4"	B-TL2M1-S	1/8"
			B-TL2M2-S	1/4"
		1/2"	B-TL4M2-S	1/4"
			B-TL4M3-S	3/8"
			B-TL4M4-S	1/2"
B-TL4M6-S	3/4"			

STD. HOSE BARB		SIZE	PART No.	THREAD SIZE NPT
		1/4"	B-TL2S2-S	1/4"





## DR Series Quick Disconnects... Automatic Push-to-Connect Design

BRECO DR Series couplers are designed to interchange with Rectus 21 KA couplers using un-valved plugs. The DR Series products provide automatic push-to-connect ease and high flow in a 1/8" connection size.

### Features:

- Maximized flow path allows greater flow than other 1/8" NPT coupler designs
- 6 retaining balls versus 5 in the Rectus 21 KA provides greater plug retention
- 9/16" Wrench flats versus 14mm on Rectus 21 KA
- Ball-holes with corner radius have 65% more ball-to-body contact area and provides longer life and increased reliability
- Precision molded leak-proof seal
- Quick, easy push-to-connect design
- Brass construction for corrosion resistance

### Specifications

Material: Brass plugs & sockets

Seal: Buna-N

Air Flow: 17 CFM @ 100 PSIG @ 5.0 PSIG Pressure Drop

Working Pressure: 300 PSIG

Body Sizes: 1/8"

Connection Sizes: 1/8" NPT

Interchangeability: Rectus 21 KA, Tomco SC, Camozzi 5000 and CEJN 223 Series

	PART No.	DESCRIPTION
	DR21-1F	1/8" Socket Brass x 1/8" NPT Female
	DR21-1M	1/8" Socket Brass x 1/8" NPT Male
	DR21-1PF	1/8" Plug Brass x 1/8" NPT Female
	DR21-1PM	1/8" Plug Brass x 1/8" NPT Male

Pneumatic Systems

Hydraulic Systems

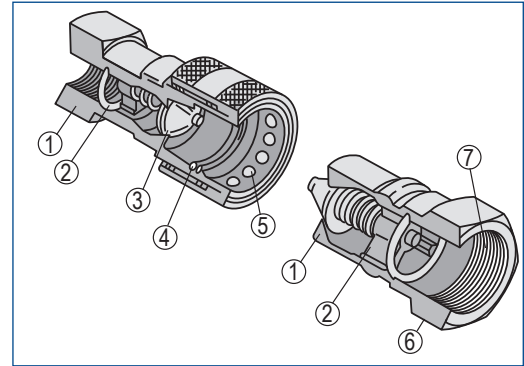
Miscellaneous

B  
C, D  
SV, SVPC, Int Plugs  
J, L  
O, DW, U  
TL, DR  
DS, 4000  
6100, FF  
6600, W  
ST. H  
Mold  
Garden, Lubricator  
Pipe Fittings  
Blow Guns  
Air Line Products  
Hose, Safety



### Features:

1. ISO B, Hardened plugs and sleeves constructed from solid bar stock ensures long service life and maximum resistance to damage from hydraulic and mechanical shock.
2. High flow capacity.
3. BRECO's conical valve with its 360° metal to metal valve stop maintains valve alignment and insures that poppets open fully every time.
4. Captive valve seal ensures "bubble tight" poppet sealing since seal is positively captured by the metal poppet to minimize seal washout or damage from high fluid velocity.
5. Ball locking mechanism ensures reliable connections every time. Many ball bearings distribute the load while providing alignment and excellent swiveling action to reduce hose torque and prolong hose life.
6. Broad range of metals and seal materials allow the use of most fluids.
7. Industrial Interchange



### Applications

"DS" Series sockets incorporate valves in both socket and plug halves to prevent fluid loss when the socket is disconnected. These sockets are normally referred to as "hydraulic couplings", but they are used extensively with other media where objectionable. The "DS" Series sockets are available in ROHS compliant steel and brass.

### Specifications:

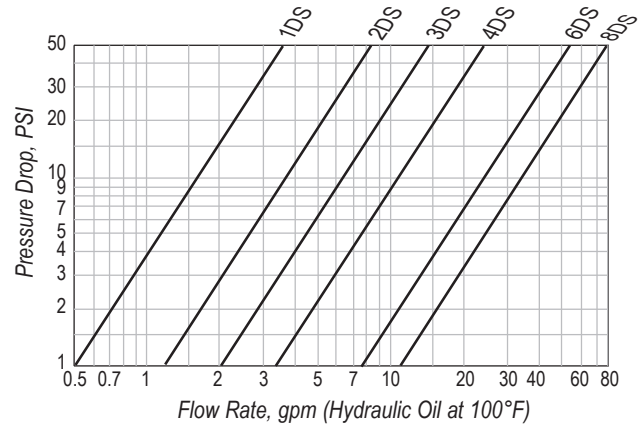
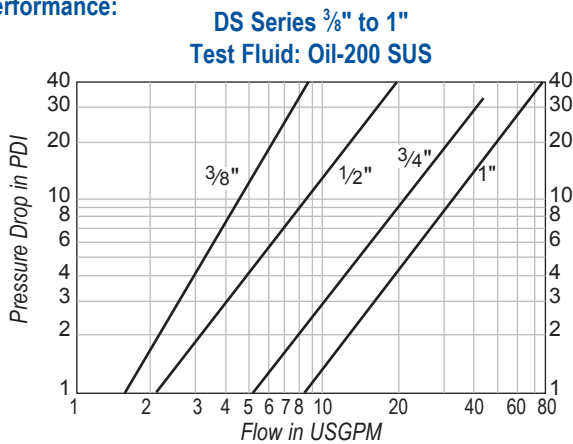
		RATED PRESSURE, COUPLED					
	SIZE	BRASS		STEEL		STAINLESS STEEL	
		PSI	BAR	PSI	BAR	PSI	BAR
1DS	1/8"	3,000	207	4,000	275	5,000	344
2DS	1/4"	2,700	186	3,700	225	3,700	255
3DS	3/8"	2,200	152	3,700	255	3,700	255
4DS	1/2"	2,250	155	5,000	345	4,250	293
6DS	3/4"	2,000	138	4,000	275	3,500	242
8DS	1"	1,500	103	4,000	275	2,500	173

### Ordering Information:

"DS" Series couplings are available in ROHS compliant plated steel, brass, and 303 Stainless as standard. Brass couplings have double O-Ring seals (excluding 1/8") and stainless locking balls. Standard seals are Buna-N (Nitrile). Consult factor for optional seals.

All sizes can be furnished with locking sleeves designated by "SL" (Sleeve-Lock) suffix after regular catalog numbers.

### Performance:



### "DS" Series Sockets

FEMALE THREAD	SIZE	PART No.			THREAD SIZE NPTF
		BRASS	STEEL	TYPE 303 STAINLESS	
	1/8"	1DSF1-B	1DSF1-S	1DSF1-SS	1/8-27
	1/4"	2DSF2-B	2DSF2-S	2DSF2-SS	1/4-18
		2DSF2-BI	-	-	1/4-18
	3/8"	3DSF3-B	3DSF3-S	3DSF3-SS	3/8-18
	1/2"	4DSF4-B	4DSF4-S	4DSF4-SS	1/2-14
	3/4"	6DSF6-B	6DSF6-S	6DSF6-SS	3/4-14
1	8DSF8-B	8DSF8-S	8DSF8-SS	1-11 1/2	

Note: Socket 2DSF2-BI for Carpet Cleaners (Standard EPDM Seals)  
Contact Factory for larger sizes

**NOTE: Dust Plugs and Dust Caps shown on follow page.**

### "DS" Series Plugs

FEMALE THREAD	SIZE	PART No.			THREAD SIZE NPTF
		BRASS	STEEL	TYPE 303 STAINLESS	
	1/8"	DS1F1-B	DS1F1-S	DS1F1-SS	1/8-27
	1/4"	DS2F2-B	DS2F2-S	DS2F2-SS	1/4-18
		DS2F2-BI	-	-	1/4-18
	3/8"	DS3F3-B	DS3F3-S	DS3F3-SS	3/8-18
	1/2"	DS4F4-B	DS4F4-S	DS4F4-SS	1/2-14
	3/4"	DS6F6-B	DS6F6-S	DS6F6-SS	3/4-14
1"	DS8F8-B	DS8F8-S	DS8F8-SS	1-11 1/2	

Note: Plug DS2F2-BI for Carpet Cleaners (Standard EPDM Seals)  
Contact Factory for larger sizes



## "DS" Series Dust Plugs and Caps

### Dust Plugs and Dust Caps

- Protective dust plugs and caps play a crucial role in the use of quick couplings and no purchase of a hydraulic quick coupling is complete without the selection of an appropriate dust plug and cap. Dust plugs and caps serve a two-fold function. They keep the mating surface clean and free of contamination and protect the critical mating elements of the coupling halves when they are disconnected. In this way the plug is protected from damage that would make the total coupling unusable.
- When ordering the dust cap/plug body size must correspond to that of the socket or plug.

SIZE	DUST PLUG PART No.		DUST CAP PART No.	
	ALUMINUM	POLYURETHANE	ALUMINUM	POLYURETHANE
1/8"	BH1-65	BH1-65M	BH1-66	BH1-66M
1/4"	BH2-65	BH2-65M	BH2-66	BH2-66M
3/8"	BH3-65	BH3-65M	BH3-66	BH3-66M
1/2"	BH4-65	BH4-65M	BH4-66	BH4-66M
3/4"	BH6-65	BH6-65M	BH6-66	BH6-66M
1"	BH8-65	BH8-65M	BH8-66	BH8-66M

## "4000" Series - [PIONEER AG INTERCHANGE]

### Features:

- The "4000" Series is a proven design for use on construction equipment, agricultural machinery, oil tools, steel mill machinery, and other demanding hydraulic applications.
- Socket and plug are precision machined from solid barstock. A ball-locking mechanism holds the mating halves together, and critical parts are induction hardened for durability.
- Couplings feature steel ball check valves for dependability in heavy-duty hydraulic applications, within rated working pressures.

### "4000" Series Sockets

FEMALE THREAD	SIZE	PART No. STEEL	THREAD SIZE	
			NPTF	ORB
			1/4"	B-4050-2
		B-4050-2P	1/4"-18	-
	3/8"	B-4050-3	3/8"-18	-
	1/2"	B-4050-4	1/2"-14	-
		B-4050-4P	1/2"-14	-
		B-4050-5	3/4"-14	-
		B-4050-15	-	3/4"-16
		B-4050-16	-	7/8"-14
	3/4"	B-4150-5	3/4"-14	-
	1"	B-4050-6	1-11 1/2"	-
		B-4050-6P	1-11 1/2"	-

### "4000" Series Plugs

FEMALE THREAD	SIZE	PART No. STEEL	THREAD SIZE	
			NPTF	ORB
			1/4"	B-4010-2
		B-4010-2P	1/4"-18	-
	3/8"	B-4010-3	3/8"-18	-
	1/2"	B-8010-4	1/2"-14	-
		B-8010-4P	1/2"-14	-
		B-8010-5	3/4"-14	-
		B-8010-15	-	3/4"-16
		B-8010-16	-	7/8"-14
	3/4"	B-4110-5	3/4"-14	-
	1"	B-4010-6	1-11 1/2"	-
		B-4010-6P	1-11 1/2"	-

## Rubber Dust Plugs & Dust Caps

SIZE	DUST PLUG PART No.	DUST CAP PART No.
	RUBBER	RUBBER
1/4"	B-5205-2M	B-5209-2M
3/8"	B-5205-3	B-5209-3
1/2"	B-5205-4M	B-5209-4M
3/4"	B-5205-5	B-5209-5
1"	B-5205-6	B-5209-6

### Special Order Information:

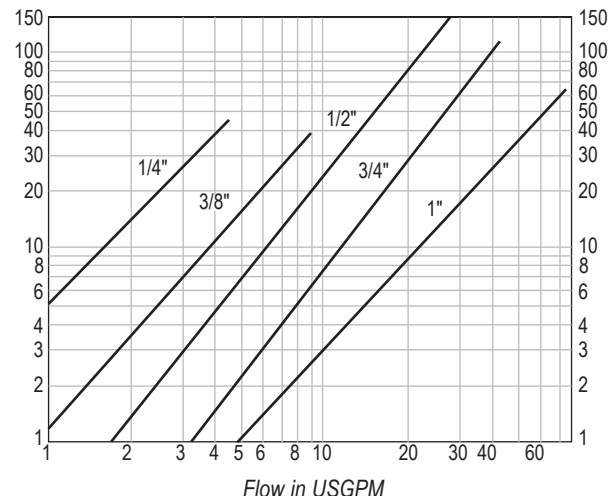
Standard seal material is Buna-N (Nitrile), other seal options are available. Consult factory.

### Specifications:

BODY SIZE	1/4"	3/8"	1/2"	3/4"	1"
Rated Pressure (PSI)	3000	3000	3000	3000	3000
Rated Flow (GPM)	3	6	12	28	50
Temperature Range (Std seals)	-40° to +250°F				

### Performance:

### "4000" Series (1/4" to 1") Test Fluid: OIL-200 SUS





# "6100" Series - [Wing Nut]



## Specifications:

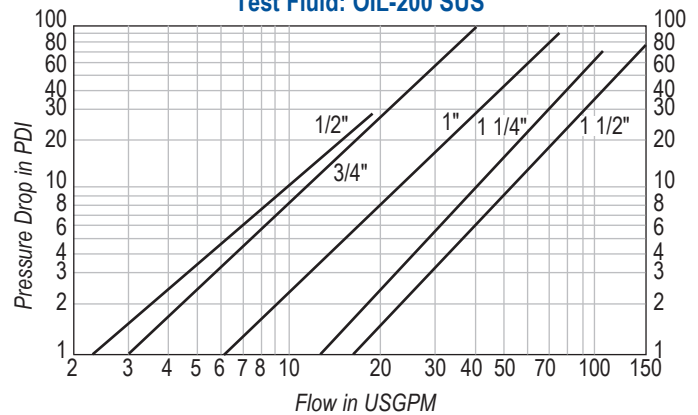
	SIZE				
	3/4"	3/4"	1	1 1/4"	1 1/2"
Dash Number	-08	-12	-16	-20	-24
*Rated Pressure (PSI)					
Female Half	3000	3000	3000	2750	2000
Male Half	3000	3000	3000	2500	2500
Complete Coupling Assembly	3000	3000	3000	2750	2500
Temperature Range (std seals)	-40° to +250° F.				
Rated Flow (GPM)	12	28	50	76	100

\*Minimum burst pressure is equal to three times the rated pressure.

Not recommended for continuous hydraulic impulse applications at rated pressures.

## Performance:

"6100" Series (1/2" to 1-1/2")  
Test Fluid: OIL-200 SUS



## "6100" Series Coupling Assemblies

COUPLING WITH WING NUT	SIZE	THREAD SIZE NPTF	PART No.	
			WITH FLANGE	WITHOUT FLANGE
			3/4"	1/2-14
	3/4-14	B-6100-12	B-6120-12	
	1"	1-11 1/2	B-6100-16	B-6120-16
	1 1/4"	1 1/4-11 1/2	B-6100-20	B-6120-20
	1 1/2"	1 1/2-11 1/2	B-6100-24	B-6120-24

COUPLING WITH HEX NUT	SIZE	THREAD SIZE NPTF	PART No.	
			WITH FLANGE	WITHOUT FLANGE
			3/4"	1/2-14
	3/4-14	B-6110-12	B-6130-12	
	1"	1-11 1/2	B-6110-16	B-6130-16
	1 1/4"	1 1/4-11 1/2	B-6110-20	B-6130-20
	1 1/2"	1 1/2-11 1/2	B-6110-24	B-6130-24

## Plugs

PLUG	SIZE	PART No. - BRASS		THREAD SIZE NPTF
		WITHOUT FLANGE	WITH FLANGE	
	3/4"	B-6105-08	B-6115-08	1/2-14
		B-6105-12	B-6115-12	3/4-14
	1"	B-6105-16	B-6115-16	1-11 1/2
	1 1/4"	B-6105-20	B-6115-20	1 1/4-11 1/2
1 1/2"	B-6105-24	B-6115-24	1 1/2-11 1/2	

OPTIONAL FLANGE	SIZE	PART No. - STEEL
	3/4"	B-6107-08
	1"	B-6107-16
	1 1/4"	B-6107-20
1 1/2"	B-6107-24	

## Sockets

WING NUT	SIZE	PART No. BRASS	THREAD SIZE NPTF
	3/4"	B-6125-08	1/2-14
		B-6125-12	3/4-14
	1"	B-6125-16	1-11 1/2
	1 1/4"	B-6125-20	1 1/4-11 1/2
1 1/2"	B-6125-24	1 1/2-11 1/2	

HEX NUT	SIZE	PART No. BRASS	THREAD SIZE NPTF
	3/4"	B-6135-08	1/2-14
		B-6135-12	3/4-14
	1"	B-6135-16	1-11 1/2
	1 1/4"	B-6135-20	1 1/4-11 1/2
1 1/2"	B-6135-24	1 1/2-11 1/2	

## Dust Plugs & Dust Caps

SIZE	DUST PLUG PART No. - BRASS	DUST CAP PART No. - BRASS
3/4"	B-6109-08	B-6108-08
1"	B-6109-16	B-6108-16
1 1/4"	B-6109-20	B-6108-20
1 1/2"	B-6109-24	B-6108-24



### Features:

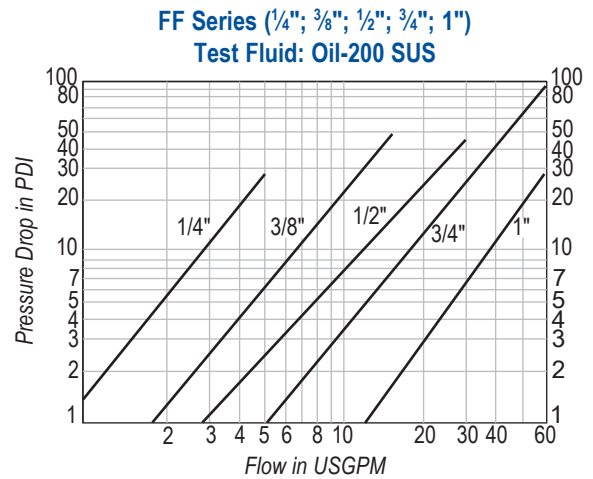
- Meets dimensional and performance standards of ISO 16028 as well as HTMA\* and NFPA.
- "FF" Series style double shut-off hydraulic couplings are intended for use on medium pressure hydraulic systems up to 2500 psi operating pressures.
- Combines dual flush face valving, push-to-connect operation, minimum fluid loss upon disconnect, low air inclusion and sleeve lock.
- Primary applications are with hydraulic tools where cleaner automatic connections are needed and in machine tool line connections where minimum fluid leaks can be tolerated.

\*Hydraulic Tool Mfg. Assoc. and National Fluid Power Assoc.

### Specifications:

	SIZE				
	1/4"	3/8"	1/2"	3/4"	1"
Rated Pressure (psi)	5,000	5,000	5,000	5,000	5,000
Minimum Burst pressure, Male half (psi)	27,000	22,000	24,000	23,000	21,000
Minimum Burst pressure, Female half (psi)	27,000	25,000	23,000	20,000	20,000
Minimum Burst pressure, Coupled (psi)	27,000	23,000	25,000	22,000	22,000
Rated Flow (gpm)	3	6	12	26	50
Temperature Range	-40°F to +250° F				
Spillage (ML) (max. per disconnect)	.015	.015	.020	.150	.200
Air Inclusion (max. per disconnect)	.020	.020	.070	.100	.150

### Performance:



## "FF" Series Sockets

FEMALE THREAD	SIZE	PART No. STEEL	DUST PLUG	THREAD SIZE
				NPT
3/8"	B-3FF3-FP B-3FF4-FP	PDC-3	3/8-18 FPT	
			1/2-14 FPT	
1/2"	B-4FF4-FP B-4FF4-FP-SAE	PDC-4	1/2-14 FPT	
			3/4-16 SAE	
	B-4FF6-FP B-4FF6-FP-SAE		3/4-14 FPT	
			1 1/16-12-SAE	
3/4"	B-6FF6-FP B-6FF6-FP-SAE	PDC-6	3/4-14 FPT	
			1 1/16-12-SAE	
1"	B-8FF8-FP	PDC-8	1-11 1/2 FPT	

## "FF" Series Plugs

FEMALE THREAD	SIZE	PART No. STEEL	DUST CAP	THREAD SIZE
				NPT
3/8"	B-FF3F3-FP B-FF3F4-FP	SDC-3	3/8-18 FPT	
			1/2-14 FPT	
1/2"	B-FF4F4-FP B-FF4F4-FP-SAE	SDC-4	1/2-14 FPT	
			3/4-16 SAE	
	B-FF4F6-FP B-FF4F6-FP-SAE		3/4-14 FPT	
			1 1/16-12-SAE	
3/4"	B-FF6F6-FP B-FF6F6-FP-SAE	SDC-6	3/4-14 FPT	
			1 1/16-12-SAE	
1"	B-FF8F8-FP	SDC-8	1-11 1/2 FPT	



### Features:

- BRECO "6600" Series couplings feature poppet valves with solid metal perch that maintains valve alignment and prevents flow checking. Both the sleeves of the socket and plug are case hardened to make the couplings resistant to damage from brinelling and mechanical shock.
- The durable ball-locking mechanism ensures a reliable connection every time.
- These couplings have female pipe and straight thread end configurations as standard. The dimensional requirements of Series A in ISO 7241-1. Socket and plug are interchangeable with other parts compatible with ISO 7241-1.

### Applications:

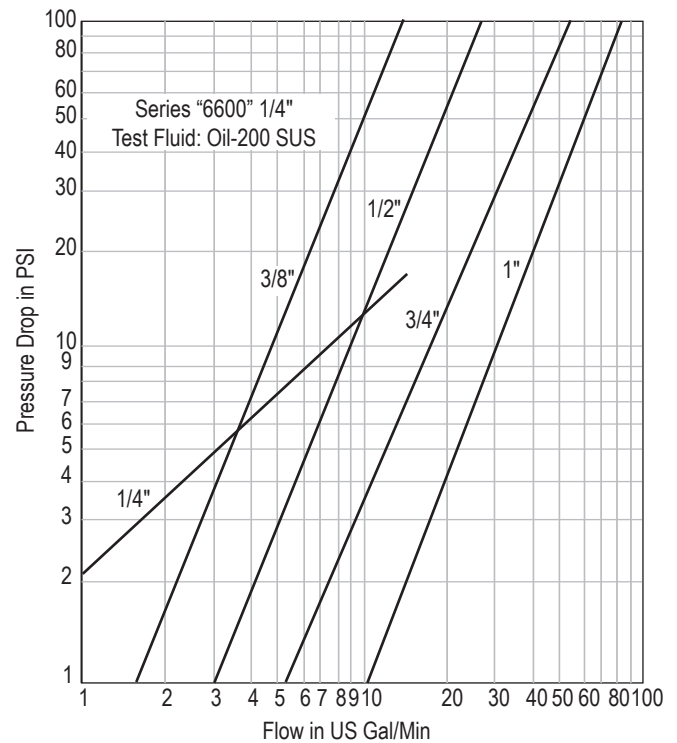
The versatile "6600" Series couplings are used in a wide range of hydraulic applications including construction equipment, manufacturing machinery, and in-plant systems. They can be found anywhere the fluid transfer lines need to be connected and disconnected for operation or maintenance of equipment. Rugged construction makes it a good choice for mobile applications including dump trucks, snow plows, refuse hauling, mining, asphalt paving, truck trailer connections and many more. In-plant machinery applications include hydraulic fluid, chemicals and gas lines for paper mills, steel production, and many varieties of plant maintenance and production equipment.

### Specifications:

	SIZE				
	1/4"	3/8"	1/2"	3/4"	1"
	Rated Pressure (PSI)				
Working Pressure	5000	4000	4000	4000	4000
Temperature Range (std seals)	-40° to +250° F.				

### "6600" Series Sockets

FEMALE THREAD	SIZE	PART No. STEEL	THREAD SIZE	
			NPTF	ORB
1/4"	1/4"	B-6601-2-4	1/8-27	-
		B-6601-4-4	1/4-18	-
3/8"	3/8"	B-6601-6-6	3/8-18	-
		B-6601-8-10	1/2-14	-
1/2"	1/2"	B-6601-12-10	3/4-14	-
		B-6608-8-10	-	3/4-16
		B-6608-10-10	-	1/2-12
		B-6608-12-10	-	1 1/16-12
3/4"	3/4"	B-6601-12-12	3/4-14	-
		B-6608-12-12	-	-
1"	1"	B-6601-16-16	1 - 11 1/2	-
		B-6608-16-16	-	1 5/16-12



### Dust Plugs & Dust Caps

SIZE	DUST PLUG PART No.	DUST CAP PART No.
1/4"	B-6659-4	B-6657-4
3/8"	B-6659-6	B-6657-6
1/2"	B-6659-10	B-6657-10
3/4"	B-6659-12	B-6657-12
1"	B-6659-16	B-6657-16

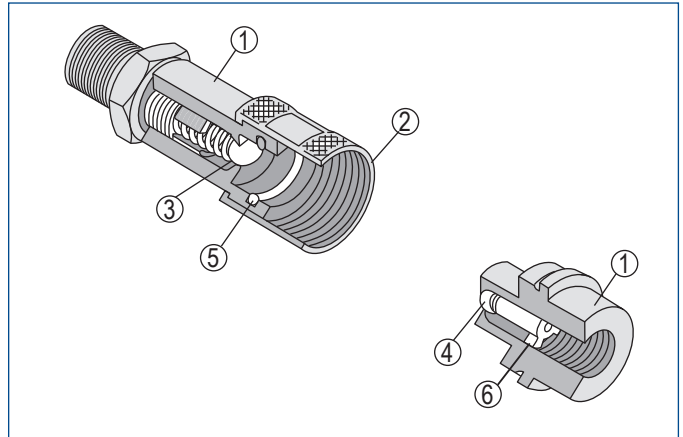
### "6600" Series Plugs

FEMALE THREAD	SIZE	PART No. STEEL	THREAD SIZE	
			NPTF	ORB
1/4"	1/4"	B-6602-2-4	1/8-27	-
		B-6602-4-4	1/4-18	-
3/8"	3/8"	B-6602-6-6	3/8-18	-
		B-6602-8-10	1/2-14	-
1/2"	1/2"	B-6602-12-10	3/4-14	-
		B-6610-6-6	-	9/16-18
		B-6610-8-10	-	3/4-16
		B-6610-10-10	-	7/8-14
3/4"	3/4"	B-6610-12-10	-	1 1/16-12
		B-6602-12-12	3/4-14	-
1"	1"	B-6610-12-12	-	1 1/16-12
		B-6602-16-16	1 - 11 1/2	-
		B-6610-16-16	-	1 5/16-12

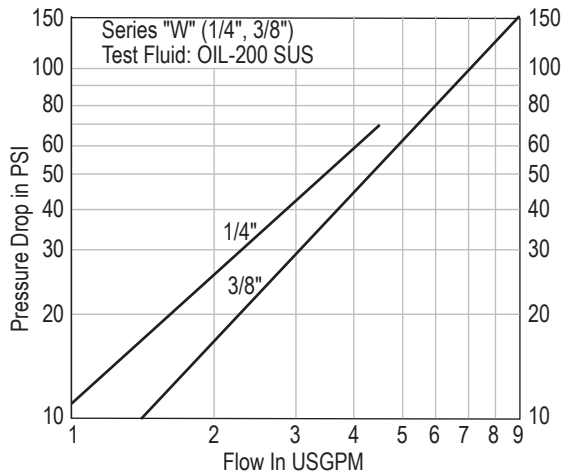


### Features:

1. Machined from solid steel bar stock for durability.
2. The "W" Series has a threaded sleeve locking mechanism, mates with matching male threads on the plug. The two halves must be manually threaded together for connection.
3. Hard, chrome alloy balls are used for valving. They are spring loaded for positive sealing of the valve.
4. The valve provides a metal-to-metal seal between the ball and a coined seat.
5. The body seal is polyurethane which resists high pressure extrusion.
6. A threaded valve retainer provides a valve stop that assures positive valve alignment.



### Performance:



### Applications:

The "W" Series couplings with their threaded union locking system and precision ball-type check valves, are designed for extreme high pressure applications such as found on portable hydraulic rams.

### Specifications:

	SIZE
Rated Pressure (psi) Static	10,000
Temperature Range (std seals)	-10° to +250°F.

### Note:

Protective dust plugs and caps play a crucial role in the life of a quick coupling and no purchase of a hydraulic quick coupling is complete without the selection of an appropriate dust plug and cap.

## "W" Series Sockets

	SIZE	PART No.		THREAD SIZE
		VALVE	NON-VALVE	
	1/4"	B-2WM2-S	B-2WEM2-S	1/4-18 Male
	3/8"	B-3WM3-S	B-3WEM3-S	3/8-18 Male
B-3WF3-S		B-3WEF3-S	3/8-18 Female	

## "W" Series Plugs

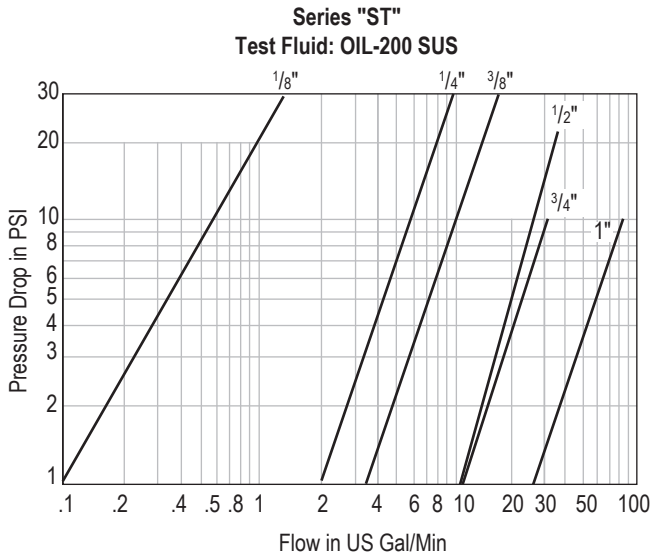
	SIZE	PART No.		THREAD SIZE NPFT
		VALVE	NON-VALVE	
	1/4"	B-W2F2-S	B-W2EF2-S	1/4-18 Female
	3/8"	B-W3F3-S	B-W3EF3-S	3/8-18 Female

## Dust Plugs & Dust Caps

SIZE	DUST PLUG PART No. STEEL	DUST CAP PART No. STEEL
1/4"	B-3005-2	B-3009-2
3/8"	B-3005-3	B-3009-3



**Performance:**



**Specifications:**

Rated Pressure (PSI)	SIZE							
	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"
Brass	2500	5200	2700	2200	1700	1200	1700	1400
Steel	2600	5500	3500	2700	2700	2000	-	-
Stainless Steel	4200	6700	5500	3000	3000	1700	-	-
Temperature Range (std seals)	-40° to +250°F.							

**"ST" Series Sockets**

FEMALE THREAD	SIZE	PART No.		THREAD SIZE NPTF
		BRASS	TYPE 303 STAINLESS	
	1/8"	1STF1-B	1STF1-SS	1/8-27
	1/4"	2STF2-B	2STF2-SS	1/4-18
	3/8"	3STF3-B	3STF3-SS	3/8-18
	1/2"	4STF4-B	4STF4-SS	1/2-14
	3/4"	6STF6-B	6STF6-SS	3/4-14
	1"	8STF8-B	8STF8-SS	1-11 1/2

FEMALE THREAD	SIZE	PART No.			THREAD SIZE NPTF
		BRASS	STEEL	TYPE 303 STAINLESS	
	1/8"	ST1F1-B	ST1F1-S	ST1F1-SS	1/8-27
	1/4"	ST2F2-B	ST2F2-S	ST2F2-SS	1/4-18
		-	ST2F2-S-E	-	
	3/8"	ST3F3-B	ST3F3-S	ST3F3-SS	3/8-14
	1/2"	ST4F4-B	ST4F4-S	ST4F4-SS	1/2-14
	3/4"	ST6F6-B	ST6F6-S	ST6F6-SS	3/4-14
	1"	ST8F8-B	ST8F8-S	ST8F8-SS	1-11 1/2

Note: ST2F2-S-E is extended plug

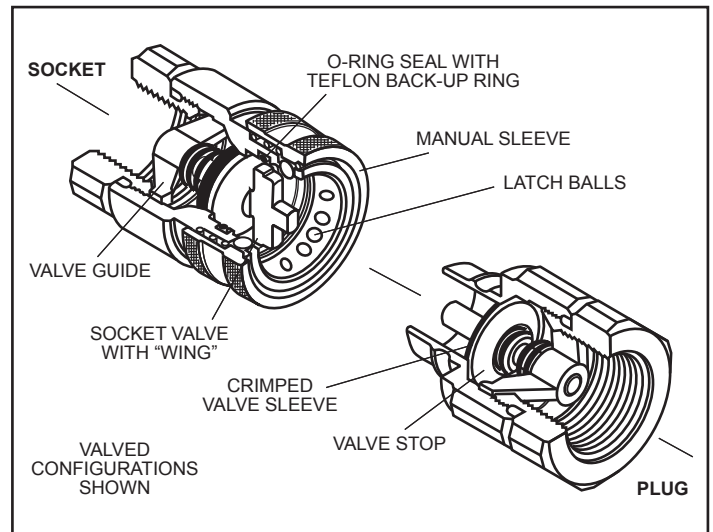
MALE THREAD	SIZE	PART No.		THREAD SIZE NPTF
		BRASS	TYPE 303 STAINLESS	
	1/8"	1STM1-B	1STM1-SS	1/8-27
	1/4"	2STM2-B	2STM2-SS	1/4-18
	3/8"	3STM3-B	3STM3-SS	3/8-18
	1/2"	4STM4-B	4STM4-SS	1/2-14
	3/4"	6STM6-B	6STM6-SS	3/4-14
	1"	8STM8-B	8STM8-SS	1-11 1/2

MALE THREAD	SIZE	PART No.			THREAD SIZE NPTM
		BRASS	STEEL	TYPE 303 STAINLESS	
	1/8"	ST1M1-B	ST1M1-S	ST1M1-SS	1/8-27
	1/4"	ST2M2-B	ST2M2-S	ST2M2-SS	1/4-18
	3/8"	ST3M3-B	ST3M3-S	ST3M3-SS	3/8-14
	1/2"	ST4M4-B	ST4M4-S	ST4M4-SS	1/2-14
	3/4"	ST6M6-B	ST6M6-S	ST6M6-SS	3/4-14
	1"	ST8M8-B	ST8M8-S	ST8M8-SS	1-11 1/2



## Socket Features:

- Latch Mechanism
  - Manual connect and disconnect
  - Steel sleeves are hardened to provide maximum service life
- Material and Finish
  - Machined from solid bar stock
  - Steel components are zinc plated
- Coupled Seal
- Valved units incorporate a Teflon back-up ring to withstand dynamic impulse

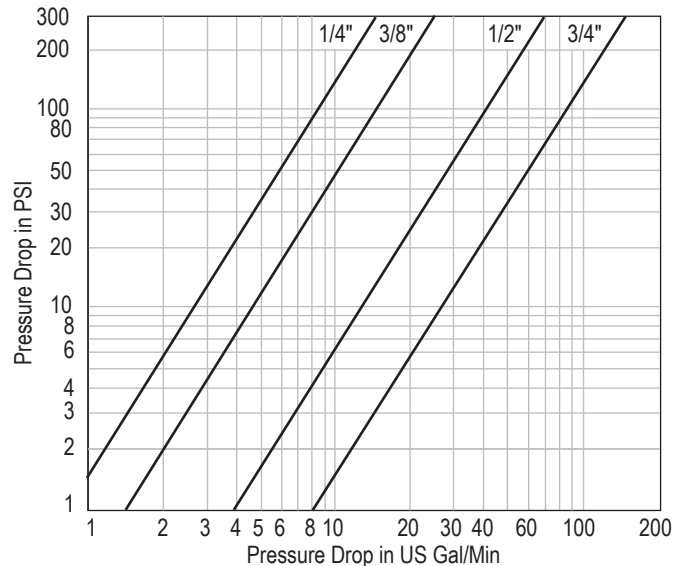


## Plug Features:

- Machined from solid bar stock
- Steel plugs are hardened and zinc plated to provide heavy duty performance
- Flow - Large diameters provide for higher flow than other double shut-off quick disconnects
- Seals
  - Buna-N (Nitrile) seals are standard
  - Valve seals are crimped in place to maintain integrity during excessive flow conditions


## Performance:

Series "H" - Valved or Non-Valved  
Test Fluid: Hydraulic Oil at 100°F








**"H" Series Sockets (with Valve)**

<b>FEMALE PIPE</b>		SIZE	NPT THREAD SIZE	PART No.	
				STEEL WITH VALVE	BRASS WITH VALVE
		1/4"	1/4-18	B-VHC4-4F	B-VHC4-4F-B
		3/8"	3/8-18	B-VHC6-6F	B-VHC6-6F-B
		1/2"	1/2-14	B-VHC8-8F	B-VHC8-8F-B
3/4"	3/4-14	B-VHC12-12F	B-VHC12-12F-B		


**"H" Series Plugs (with Valve)**

<b>FEMALE PIPE</b>		SIZE	THREAD SIZE	PART No.	
				STEEL WITH VALVE	BRASS WITH VALVE
		1/4"	1/4-18	B-VHN4-4F	B-VHN4-4F-B
		3/8"	3/8-18	B-VHN6-6F	B-VHN6-6F-B
		1/2"	1/2-14	B-VHN8-8F	B-VHN8-8F-B
3/4"	3/4-14	B-VHN12-12F	B-VHN12-12F-B		


<b>MALE PIPE</b>		SIZE	NPT THREAD SIZE	PART No.	
				STEEL WITH VALVE	BRASS WITH VALVE
		1/4"	1/4-18	B-VHC4-4M	B-VHC4-4M-B
		3/8"	3/8-18	B-VHC6-6M	B-VHC6-6M-B
		1/2"	1/2-14	B-VHC8-8M	B-VHC8-8M-B
3/4"	3/4-14	B-VHC12-12M	B-VHC12-12M-B		


<b>MALE PIPE</b>		SIZE	THREAD SIZE	PART No.	
				STEEL WITH VALVE	BRASS WITH VALVE
		1/4"	1/4-18	B-VHN4-4M	B-VHN4-4M-B
		3/8"	3/8-18	B-VHN6-6M	B-VHN6-6M-B
		1/2"	1/2-14	B-VHN8-8M	B-VHN8-8M-B
3/4"	3/4-14	B-VHN12-12M	B-VHN12-12M-B		


**"H" Series Sockets (non Valve)**

<b>FEMALE PIPE</b>		SIZE	NPT THREAD SIZE	PART No.	
				STEEL NON-VALVE	BRASS NON-VALVE
		1/4"	1/4-18	B-PHC4-4F	B-PHC4-4F-B
		3/8"	3/8-18	B-PHC6-6F	B-PHC6-6F-B
		1/2"	1/2-14	B-PHC8-8F	B-PHC8-8F-B
3/4"	3/4-14	B-PHC12-12F	B-PHC12-12F-B		

**"H" Series Plugs (non Valve)**

<b>FEMALE PIPE</b>		SIZE	THREAD SIZE	PART No.	
				STEEL NON-VALVE	BRASS NON-VALVE
		1/4"	1/4-18	B-PHN4-4F	B-PHN4-4F-B
		3/8"	3/8-18	B-PHN6-6F	B-PHN6-6F-B
		1/2"	1/2-14	B-PHN8-8F	B-PHN8-8F-B
3/4"	3/4-14	B-PHN12-12F	B-PHN12-12F-B		

<b>MALE PIPE</b>		SIZE	NPT THREAD SIZE	PART No.	
				STEEL NON-VALVE	BRASS NON-VALVE
		1/4"	1/4-18	B-PHC4-4M	B-PHC4-4M-B
		3/8"	3/8-18	B-PHC6-6M	B-PHC6-6M-B
		1/2"	1/2-14	B-PHC8-8M	B-PHC8-8M-B
3/4"	3/4-14	B-PHC12-12M	B-PHC12-12M-B		

<b>MALE PIPE</b>		SIZE	THREAD SIZE	PART No.	
				STEEL NON-VALVE	BRASS NON-VALVE
		1/4"	1/4-18	B-PHN4-4M	B-PHN4-4M-B
		3/8"	3/8-18	B-PHN6-6M	B-PHN6-6M-B
		1/2"	1/2-14	B-PHN8-8M	B-PHN8-8M-B
3/4"	3/4-14	B-PHN12-12M	B-PHN12-12M-B		

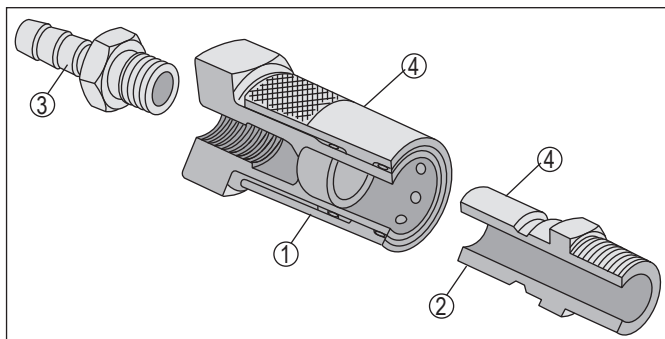
**Configuration: Valved, or Non-Valved**

SIZE	STATIC PRESSURE RATING (PSI) —MATERIAL—		RATED FLOW (GPM)	
	BRASS	STEEL	VALVED	NON-VALVED
1/4"	2,250	6,500	4.5	4.5
3/8"	2,250	4,500	6.5	6.5
1/2"	2,000	4,000	17	20
3/4"	2,000	3,500	35	40



[INTERCHANGE WITH FOSTER FJT, DME JIFFY-TITE AND JIFFY-MATIC AND PARKER INJECTION MOLD SERIES]

1. Available with or without valves in the coupler. Non-valved couplers have minimum flow resistance for maximum cooling. Valved couplers shut off automatically upon disconnect. Valved couplers can be used with either valved or non-valved nipples. A valved nipple, however, must be used with a newly designed "AV" coupler.
2. Nipples are designed to be recessed below mold surfaces to provide more efficient storage of molds and prevent damage to the nipple.
3. Widest choice of end fittings available, including straight, 45° or 90° with standard hose barb or Push-Lok barbs for easy installation.
4. Couplers and nipples are made of corrosion resistant brass, and valved couplers or valved nipples have a Viton O-ring on poppet and Silicone interface seal as standard for use with water glycol (anti-freeze) type fluids commonly used in heat transfer systems.



### Applications

Injection Mold Series couplings are specifically designed for connecting coolant lines to molds and dies, on injection molding machinery in the plastics and die casting industries. Injection Mold Series couplings significantly reduce machine downtime by providing fast and easy connection of coolant lines during mold changes. Their short nipples can be recessed below the surface of the mold for more efficient storage of molds. Injection Mold Series couplers are available with or without valves in the female half. Non-valved couplers provide maximum flow for efficient cooling. Valved couplers shut off when disconnected.

### Selection Guidelines

Injection Mold Series couplings are designed for a maximum working pressure of 200 PSI. Most thermoplastic and thermostat heat transfer systems have pumps which provide relatively high flow rates at relatively low pressures. Water and water glycol (anti-freeze) systems usually have capacities ranging from 10 to 40 gpm, with most from 10 to 15 gpm. Normal medial opening pressures are 20 to 60 PSI for these systems. Heat transfer systems using oil generally operate from 10 to 30 PSI. However, their flow rates are usually much higher, requiring the total volume of oil to be circulated at least once per minute.

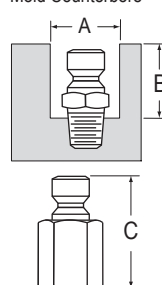
### Specifications:

Rated Pressure: 200 PSI

Temperature Range: -90° to +440°

PERFORMANCE DATA		FLOW - WATER - GPM, 10 PSIG PRESSURE DROP
200 Series	Straight-Thru	4.5
	One Way (valved)	2.3
300 Series	Straight-Thru	10.0
	High Flow	13.8
	One Way (valved)	5.9
500 Series	Straight-Thru	28.2

Mold Counterbore



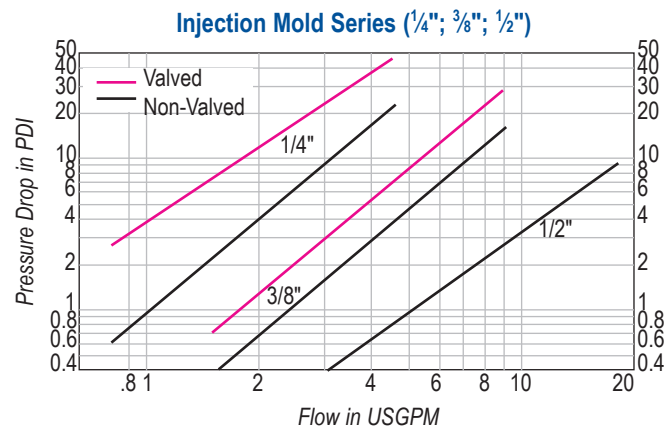
CAT. No.	NPT	A	B	C
B-PN251	1/8"	.687	.687	1.000
B-PN252	1/4"	.843	.937	1.278
B-PN253	3/8"	1.00	.937	1.373
B-PN352	1/4"	1.00	1.092	1.450
B-PN353	3/8"	1.00	1.125	1.574
B-PN354	1/2"	1.187	1.250	-
B-PN554	1/2"	1.250	1.500	1.750
B-PN556	3/4"	1.500	1.562	1.750

The number of hose connections in a single mold system results in a cumulative pressure drop. Please note the Pressure Drop vs. Flow Rate chart provided, to select the appropriate size.

Temperature is another important consideration. Injection Mold Series couplings with their standard Silicone seal have a temperature capability of -90° to +440°F. Rapid deterioration of the seal and leaking may result if used beyond these limits.

External conditions of temperature, corrosive atmospheres, and other abnormalities may affect coupling performance and must be considered when selection is made consult factory with questions.

### Performance:





## Injection Mold Series Sockets

## Injection Mold Series Plugs

STRAIGHT	SIZE	PART No.		HOSE ID
		BRASS NON-VALVED	BRASS WITH VALVE	
		1/4"	B-PC204	
B-PC204-BP	PC204AV-BP		1/4"	
B-PC205	B-PC205AV		5/16"	
B-PC206	B-PC206AV		3/8"	
B-PC206-BP	B-PC206AV-BP		3/8"	
3/8"	B-PC306	B-PC306V	3/8"	
	B-PC306-BP	B-PC306V-BP	3/8"	
	B-PC308	B-PC308V	1/2"	
	B-PC308-BP	B-PC308V-BP	1/2"	
1/2"	B-PC504	-	1/2"	
	B-PC504-BP	-	1/2"	
	B-PC506	-	3/4"	

FEMALE PIPE THREAD	SIZE	PART No.		THREAD SIZE NPTF
		BRASS	STEEL	
		1/4"	B-BPN251F	
B-BPN252F	B-PN252F		1/4".18	
B-BPN253F	B-PN253F		3/8".18	
3/8"	B-BPN352F	B-PN352F	1/4".18	
	B-BPN353F	B-PN353F	3/8".18	

45 DEGREE	SIZE	PART No.		HOSE ID
		BRASS NON-VALVED	BRASS WITH VALVE	
		1/4"	B-PC224	
B-PC224-BP	B-PC224AV-BP		1/4"	
B-PC225	B-PC225AV		5/16"	
B-PC226	B-PC226AV		3/8"	
B-PC226-BP	B-PC226AV-BP		3/8"	
3/8"	B-PC326	B-PC326V	3/8"	
	B-PC326-BP	B-PC326V-BP	3/8"	
	B-PC328	B-PC328V	1/2"	
	B-PC328-BP	B-PC328V-BP	1/2"	

MALE PIPE THREAD	SIZE	PART No.	THREAD SIZE NPTF
		BRASS	
		1/4"	
B-PN252	1/4".18		
B-PN253	3/8".18		
3/8"	B-PN352	1/4".18	
	B-PN353	3/8".18	
1/2"	B-PN354	1/2".14	
	B-PN554	1/2".14	
	B-PN556	3/4".14	

90 DEGREE	SIZE	PART No.		HOSE ID
		BRASS NON-VALVED	BRASS WITH VALVE	
		1/4"	B-PC214	
B-PC214-BP	B-PC214AV-BP		1/4"	
B-PC215	B-PC215AV		5/16"	
B-PC216	B-PC216AV		3/8"	
B-PC216-BP	B-PC216AV-BP		3/8"	
3/8"	B-PC316	B-PC316V	3/8"	
	B-PC316-BP	B-PC316V-BP	3/8"	
	B-PC318	B-PC318V	1/2"	
	B-PC318-BP	B-PC318V-BP	1/2"	

## Garden Hose Couplings

### Features:

- Brass and stainless steel construction for heavy duty service.
- Durable 4-ball locking mechanism for secure connections.
- Temperature-resistant BUNA seals for a leak-free service life.

### Applications:

The Garden Hose couplings are used anywhere water hoses are connected and disconnected frequently. They are used on a wide variety of applications including garden hoses, wash down system, and mobile water tank lines. The unvalved design permits maximum flow with minimum pressure drop.

### Specifications:

- Body Size  $\frac{3}{4}$ "
- Rated Pressure (psi): 200
- Temperature Range (BUNA seals):  $-40^{\circ}$  to  $+250^{\circ}$  F.

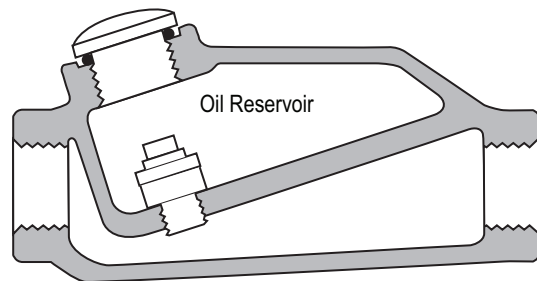
### Features:

- Provides secure nipple-to-hose clamping. Made from high-quality bar stock.

<b>SOCKET</b>		SIZE	PART No.	THREAD SIZE NH
		$\frac{3}{4}$ "	B-7455	$\frac{3}{4}$ -11 $\frac{1}{2}$

<b>PLUG</b>		SIZE	PART No.	THREAD SIZE NH
		$\frac{3}{4}$ "	B-7465	$\frac{3}{4}$ -11 $\frac{1}{2}$

## In-Line Lubricators



Oil flow can be regulated by removing the fill plug and turning the adjustment valve with a screwdriver. The portable BL Series lubricators are ruggedly constructed of cast aluminum alloy and require minimal maintenance.

### Dimensions & Specifications:

MODEL No.	BL-0	BL-1	BL-2	BL-3
Pipe Size	$\frac{1}{2}$ " NPT	$\frac{3}{4}$ " NPT	$\frac{3}{4}$ " NPT	1" NPT
Oil Capacity (fl oz)	1.4 fl. oz.	3.7 fl. oz.	11 fl. oz.	17 fl. oz.
Oil Capacity (ml)	40 ml	110 ml	320 ml	480 ml
Max Working Pressure (psig)	500	260	300	250
Air Flow Cap (Max scfm @70 psi)	30	70	70	150
Length (in.)	4 $\frac{1}{4}$ "	6	7	10
Width (in.)	2 $\frac{1}{4}$ "	2 $\frac{3}{4}$ "	3 $\frac{1}{2}$ "	4 $\frac{1}{4}$ "
Height (in.)	2 $\frac{1}{4}$ "	2 $\frac{3}{4}$ "	3 $\frac{3}{4}$ "	4
Weight (oz.)	14	22	38	69

### Features:

- Available in  $\frac{1}{2}$ ",  $\frac{3}{4}$ " and 1" NPT pipe sizes.
- Adapters may be used for smaller pipe diameters.
- Simple, in-line installation.
- Leak-proof, transparent sight disk allows visual oil level inspection.
- Oil easily added through top-mounted fill plug.
- Lightweight and portable.
- Rugged construction, low maintenance.
- Low cost




# Hose Barbs & Push-Lock Hose Barbs





## Features:


- Push-Lock deep grooved barbs create a tight hose connection. They are easy to use...right on the job - just push the hose on!

MALE HOSE BARB			PART No.	HOSE I.D.	NPT THREAD SIZE
	HBM-1-1	1/8"	1/8-27		
	HBM-1-2	1/8"	1/4-18		
	HBM-25-1	3/16"	1/8-27		
	HBM-25-2	3/16"	1/4-18		
	HBM-2-1	1/4"	1/8-27		
	HBM-2-2	1/4"	1/4-18		
	HBM-2-3	1/4"	3/8-18		
	HBM-5-1	5/16"	1/8-27		
	HBM-5-2	5/16"	1/4-18		
	HBM-5-3	5/16"	3/8-18		
	HBM-3-1	3/8"	1/8-27		
	HBM-3-2	3/8"	1/4-18		
	HBM-3-3	3/8"	3/8-18		
	HBM-3-4	3/8"	1/2-14		
	HBM-3-6	3/8"	3/4-14		
	HBM-4-2	1/2"	1/4-18		
	HBM-4-3	1/2"	3/8-18		
	HBM-4-4	1/2"	1/2-14		
	HBM-4-6	1/2"	3/4-14		
HBM-7-3	5/8"	3/8-18			
HBM-7-4	5/8"	1/2-14			
HBM-7-6	5/8"	3/4-14			
HBM-6-4	3/4"	1/2-14			
HBM-6-6	3/4"	3/4-14			
HBM-8-6	1	3/4"-14			
HBM-8-8	1	1 -11 1/2"			

FEMALE HOSE BARB			PART No.	HOSE I.D.	NPT THREAD SIZE
	HBF-1-1	1/8"	1/8-27		
	HBF-1-2	1/8"	1/4-18		
	HBF-25-1	3/16"	1/8-27		
	HBF-25-2	3/16"	1/4-18		
	HBF-2-1	1/4"	1/8-27		
	HBF-2-2	1/4"	1/4-18		
	HBF-2-3	1/4"	3/8-18		
	HBF-5-1	5/16"	1/8-27		
	HBF-5-2	5/16"	1/4-18		
	HBF-5-3	5/16"	3/8-18		
	HBF-3-1	3/8"	1/8-27		
	HBF-3-2	3/8"	1/4-18		
	HBF-3-3	3/8"	3/8-18		
	HBF-3-4	3/8"	1/2-14		
	HBF-4-2	1/2"	1/4-18		
HBF-4-3	1/2"	3/8-18			
HBF-4-4	1/2"	1/2-14			
HBF-6-6	3/4"	3/4-14			

MALE PUSH-LOCK HOSE BARB			PART No.	HOSE I.D.	NPT THREAD
	POM-2-1	1/4"	1/8-27		
	POM-2-2	1/4"	1/4-18		
	POM-2-3	1/4"	3/8-18		
	POM-3-1	3/8"	1/8-27		
	POM-3-2	3/8"	1/4-18		
	POM-3-3	3/8"	3/8-18		
	POM-3-4	3/8"	1/2-14		
	POM-3-6	3/8"	3/4-14		
	POM-4-2	1/2"	1/4-18		
	POM-4-3	1/2"	3/8-18		
	POM-4-4	1/2"	1/2-14		
	POM-4-6	1/2"	3/4-14		
POM-6-4	3/4"	1/2-14			
POM-6-6	3/4"	3/4-14			


FEMALE PUSH-LOCK HOSE BARB			PART No.	HOSE I.D.	NPT THREAD
	POF-2-1	1/4"	1/8-27		
	POF-2-2	1/4"	1/4-18		
	POF-2-3	1/4"	3/8-18		
	POF-3-1	3/8"	1/8-27		
	POF-3-2	3/8"	1/4-18		
	POF-3-3	3/8"	3/8-18		
	POF-3-4	3/8"	1/2-14		
	POF-4-2	1/2"	1/4-18		
	POF-4-3	1/2"	3/8-18		
	POF-4-4	1/2"	1/2-14		
	POF-6-6	3/4"	3/4-14		

HOSE SPICER PUSH-LOCK			PART No.	HOSE I.D.
	POS-2-2	1/4"		
	POS-3-3	3/8"		
	POS-4-4	1/2"		
	POS-6-6	3/4"		


REGULAR HOSE SPICER			PART No.	HOSE I.D.
	HS-2-2	1/4"		
	HS-3-3	3/8"		
	HS-4-4	1/2"		


<b>45° STREET ELBOW</b>		PART No.	NPT THREAD
		SE45-1-1	1/8"
		SE45-2-2	1/4"
		SE45-3-3	3/8"
		SE45-4-4	1/2"

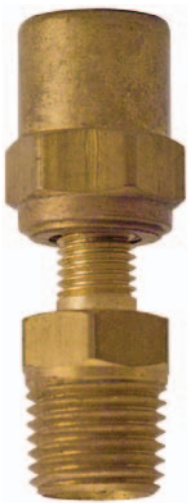
<b>90° STREET ELBOW</b>		PART No.	NPT THREAD
		SE90-1-1	1/8"
		SE90-2-2	1/4"
		SE90-3-3	3/8"
		SE90-4-4	1/2"

<b>FEMALE PIPE TEE</b>		PART No.	NPT THREAD
		PT-1	1/8"
		PT-2	1/4"
		PT-3	3/8"
		PT-4	1/2"


<b>MALE BRANCH TEE</b>		PART No.	NPT THREAD
		B-324-0202	1/8"
		B-324-0404	1/4"
		B-324-0606	3/8"


<b>FEMALE PIPE CROSS</b>		PART No.	NPT THREAD
		C-1	1/8"
		C-2	1/4"
		C-3	3/8"
		C-4	1/2"


<b>90° INTERNAL PIPE UNION</b>		PART No.	NPT THREAD
		FPE90-1-1	1/8"
		FPE90-2-2	1/4"
		FPE90-3-3	3/8"
		FPE90-4-4	1/2"

<b>RE-USEABLE MALE FITTING</b>		PART No.	HOSE		NPT THREAD SIZE	
			I.D.	O.D.		
		B-183-4084	1/4"	1/2"	1/4"-18	
		B-183-4094		9/16"	1/4"-18	
		B-183-4104		5/8"	1/4"-18	
		B-183-4086		1/2"	3/8"-18	
		B-183-5104	5/16"	5/8"	1/4"-18	
		B-183-5114		1 1/16"	1/4"-18	
		B-183-5116		1 1/16"	3/8"-18	
		B-183-6104	3/8"	5/8"	1/4"-18	
		B-183-6114		1 1/16"	1/4"-18	
		B-183-6124		3/4"	1/4"-18	
		B-183-6106		5/8"	3/8"-18	
		B-183-6116		1 1/16"	3/8"-18	
		B-183-6126		3/4"	3/8"-18	
		B-183-6108		5/8"	1/2"-14	
		B-183-6128		3/4"	1/2"-14	
		B-183-8146		1/2"	7/8"	3/8"-18
		B-183-8148			7/8"	1/2"-14
		B-183-8158	1 5/16"		1/2"-14	




<b>FEMALE REDUCER BUSHING</b>		PART No.	NPT THREAD EXTERNAL	NPTF THREAD INTERNAL
		PRB-2-1	1/4"	1/8"
		PRB-3-1	3/8"	1/8"
		PRB-3-2	3/8"	1/4"
		PRB-4-1	1/2"	1/8"
		PRB-4-2	1/2"	1/4"
		PRB-4-3	1/2"	3/8"
		PRB-6-3	3/4"	3/8"
		PRB-6-4	3/4"	1/2"
		PRB-8-4	1	1/2"
	PRB-8-6	1	3/4"	

<b>MALE REDUCING HEX NIPPLE</b>		PART No.	NPTF THREAD EXTERNAL	NPTF THREAD EXTERNAL
		B-379-0402	1/4"	1/8"
		B-379-0602	3/8"	1/8"
		B-379-0604	3/8"	1/4"
		B-379-0804	1/2"	1/4"
		B-379-0806	1/2"	3/8"

<b>MALE - FEMALE ADAPTER</b>		PART No.	NPT THREAD EXTERNAL	NPTF THREAD INTERNAL
		AD-1-1	1/8"	1/8"
		AD-1-2	1/8"	1/4"
		AD-2-2	1/4"	1/4"
		AD-2-3	1/4"	3/8"
		AD-3-3	3/8"	3/8"
		AD-3-4	3/8"	1/2"
		AD-4-4	1/2"	1/2"
		AD-4-6	1/2"	3/4"
	AD-6-6	3/4"	3/4"	

<b>FEMALE HEX NIPPLE</b>		PART No.	NPT THREAD
		B-371-0202	1/8"
		B-371-0404	1/4"
		B-371-0606	3/8"
		B-371-0808	1/2"


<b>REDUCING ADAPTER</b>		PART No.	NPT THREAD INTERNAL	NPTF THREAD INTERNAL
		B-377-0402	1/8"	1/4"
		B-377-0604	1/4"	3/8"
		B-377-0806	3/8"	1/2"


<b>HEX HEAD PLUGS</b>		PART No.	NPT THREAD
		SHP-1	1/8"
		SHP-2	1/4"
		SHP-3	3/8"
		SHP-4	1/2"


<b>MALE HEX NIPPLE</b>		PART No.	NPT THREAD
		B-370-0202	1/8"
		B-370-0404	1/4"
		B-370-0606	3/8"
		B-370-0808	1/2"
		B-370-1212	3/4"


<b>CLOSE NIPPLES</b>		PART No.	NPT THREAD
		N-1	1/8"
		N-2	1/4"
		N-3	3/8"
		N-4	1/2"
		N-6	3/4"

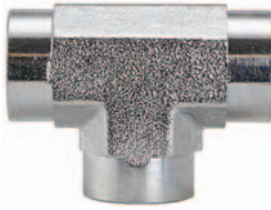


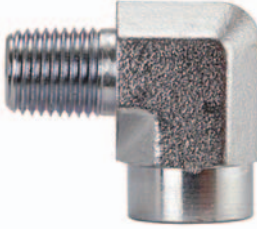
<b>PIPE COUPLING</b>		PART NUMBER	FEMALE PIPE 1	FEMALE PIPE 2
		B-5000-2	1/8"	1/8"
		B-5000-4-2	1/4"	1/8"
		B-5000-4	1/4"	1/4"
		B-5000-6-2	3/8"	1/8"
		B-5000-6-4	3/8"	1/4"
		B-5000-6-6	3/8"	3/8"
		B-5000-8-4	1/2"	1/4"
		B-5000-8-6	1/2"	3/8"
		B-5000-8	1/2"	1/2"


<b>HEX PIPE NIPPLE</b>		PART NUMBER	MALE PIPE 1	MALE PIPE 2
		B-5404-2	1/8"	1/8"
		B-5404-4-2	1/4"	1/8"
		B-5404-4	1/4"	1/4"
		B-5404-6	3/8"	3/8"
		B-5404-8-4	1/2"	1/4"
		B-5404-8-6	1/2"	3/8"
		B-5404-8	1/2"	1/2"

<b>EXPANDING PIPE ADAPTER B-5405</b>		PART NUMBER	MALE PIPE 1	FEMALE PIPE 2
		B-5405-2-4	1/8"	1/4"
		B-5405-2-6	1/8"	3/8"
		B-5405-2-8	1/8"	1/2"
		B-5405-4-4	1/4"	1/4"
		B-5405-4-6	1/4"	3/8"
		B-5405-4-8	1/4"	1/2"
		B-5405-4-12	1/4"	3/4"
		B-5405-6-6	3/8"	3/8"
		B-5405-6-8	3/8"	1/2"
		B-5405-8-8	1/2"	1/2"

<b>CLAMPS</b>		PART No.	SIZE	HOSE O.D.
		B-1113	1/2"	1/4"
		B-1315	9/16"	5/16"
		B-1518	5/8"	3/8"

<b>FEMALE PIPE TEE</b>		PART NUMBER	FEMALE PIPE CONNECTIONS
		B-5605-2	1/8"
		B-5605-4	1/4"
		B-5605-6	3/8"
		B-5605-8	1/2"

<b>90° STREET ELBOW</b>		PART NUMBER	MALE PIPE 1	FEMALE PIPE 2
		B-5502-2	1/8"	1/8"
		B-5502-2-4	1/8"	1/4"
		B-5502-2-6	1/8"	3/8"
		B-5502-4-2	1/4"	1/8"
		B-5502-4	1/4"	1/4"
		B-5502-4-6	1/4"	3/8"
		B-5502-6-4	3/8"	1/4"
		B-5502-6	3/8"	3/8"
		B-5502-6-8	3/8"	1/2"
		B-5502-8-4	1/2"	1/4"
		B-5502-8-6	1/2"	3/8"
B-5502-8-8	1/2"	1/2"		

<b>MALE ELBOW</b>		PART NUMBER	MALE PIPE 1	MALE PIPE 2
		B-5500-2	1/8"	1/8"
		B-5500-4-2	1/4"	1/8"
		B-5500-4	1/4"	1/4"
		B-5500-6-4	3/8"	1/4"
		B-5500-6	3/8"	3/8"
		B-5500-8-4	1/2"	1/4"
		B-5500-8-6	1/2"	3/8"
		B-5500-8	1/2"	1/2"

Pneumatic Systems	B
	C, D
	SV, SVPC, Int Plugs
Hydraulic Systems	J, L
	O, DW, U
	TL, DR
	DS, 4000
	6600, W
	6100, FF
	ST, H
	Mold
	Garden, Lubricator
	Pipe Fittings
	Miscellaneous
	Blow Guns
Air Line Products	
Hose, Safety	



## Drain Cocks

### Brass Fittings

The design of the drain cock uses metal-to-metal seal which requires only hand tightening to assure positive leak-proof performance.

External seal.

**Materials:** Brass bodies/steel handles except where noted.

**Pressure:** 150 psi max. (does not include hose or plastic tubing).

**Used With:** Copper, aluminum, steel hose and plastic tubing where applicable.

**Temperature:** -65° to +250°F

**Conformance:** Designed for automotive or industrial use. Not intended for natural gas, LPG, nuclear or aircraft application, except as noted.



MALE PIPE THREAD	PART No.
1/8"	DC-1
1/4"	DC-2
3/8"	DC-3

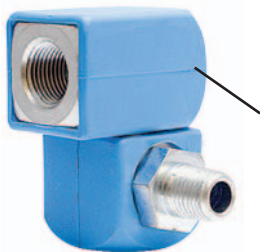
## Swivel Fittings

### Zero Pressure Connect and Disconnect Design

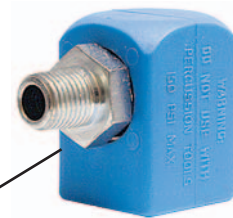
BRECO Swivel Fittings improve maneuverability and ergonomics when using air tools and spray guns. Functioning like a universal joint, swivel fittings allow the hose to remain vertical at all times, which reduces operator fatigue, repetitive motion trauma, and fitting chafe. The patented non-marring series (plastic encapsulated) is ideal for applications where non-marring and scratch reduction is needed.

#### Features:

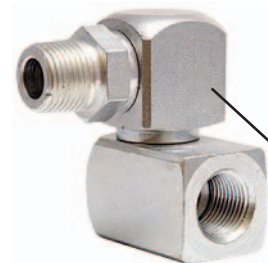
- Steel body (1/4" and 3/8"), Aluminum body (1/2")
- High flow capacity, low pressure drop
- More sizes for simplified plumbing
- Plastic encapsulation (non-marring Series)
- 300 PSIG inlet maximum



Non-Marring Dual Swivel



Non-Marring Single Swivel



Standard Swivel

NON-MARRING DUAL SWIVEL	
PART No.	DESCRIPTION
190010A	3/8" FPT x 1/4" MPT
190011A	3/8" FPT x 3/8" MPT
190012	1/2" FPT x 1/2" MPT

NON-MARRING SINGLE SWIVEL	
PART No.	DESCRIPTION
190040	3/8" FPT x 1/4" MPT
190041	3/8" FPT x 3/8" MPT
190042	1/2" FPT x 1/2" MPT

STANDARD SWIVEL (WITHOUT PLASTIC COVERING)	
PART No.	DESCRIPTION
190026A	1/4" FPT x 1/4" MPT
190029A	3/8" FPT x 1/4" MPT
190027A	3/8" FPT x 3/8" MPT
190028	1/2" FPT x 1/2" MPT

When used with percussion tools, a minimum of 18" of hose between tool and swivel is required.



BRECO BG Series Blowguns combine durability, performance, and safety to meet your specific cleaning or drying applications.

**Features:**

- Lever activation
- 10 different nozzle choices
- Blow gun kit provides versatility
- Quick-disconnect nozzle adapter
- ¼" NPT inlet
- OSHA Compliant\* @ Max 150 PSI inlet Pressure



Pistol grip blow guns are ergonomically designed for operator comfort and safety.

**Features:**

- Lightweight nylon body insulates from refrigerated air
- Machined brass valve, nozzle & hose inlet for strength
- Lever style trigger with comfortable grip for variable air flow
- ¼" NPT female inlet
- 125 PSIG inlet maximum
- OSHA Compliant\* meets 1910.242(b) pressure relief and 1910.95 noise level @ Max 150 PSI inlet Pressure

PART No.	DESCRIPTION	Flow (CFM) @ 100 PSIG
BG45	Pistol Grip Gun with BGN5 (shown in photo above)	20.0
BG4X12	Pistol Grip Gun with BGX12	13.3
301804	Pistol Grip Gun Only	-

Other BG Series nozzles and extensions may also be used with this blow gun.

\* WARNING: To be OSHA compliant, non-relieving nozzles may only be used when the blowgun's inlet pressure is regulated to 30 PSI maximum.

GUNS ONLY, NO TIPS INCLUDED	
GUN ONLY	DESCRIPTION
116482	Lever Action Gun Only- NO TIPS INCLUDED
301804	Pistol Grip Gun Only - NO TIPS INCLUDED

BLOW GUNS AND TIPS					
GUN W/NOZZLE SHOWN	NOZZLE ONLY	DESCRIPTION	PERFORMANCE @100 PSIG		
			FLOW CFM	OUTLET BLOCKED	NOISE LEVEL DBA
BG21 LEVER GUN W/NOZZLE	BGN1	Standard nozzle for general blowing and drying applications	17.5	20	89.5
BG2B5 LEVER GUN W/NOZZLE	BGNB5	Air Screen nozzle reduces chip fly back	5	18	85
BG25 LEVER GUN W/NOZZLE	BGN5	High flow safety nozzle for general dusting and chip removal	20	20	89
BG45 PISTOL GUN W/NOZZLE					
BG26 (*) LEVER GUN W/NOZZLE	BGN6	Needle tip nozzle for fine flow and for small holes	(*)	-	-
BG27 (*) LEVER GUN W/NOZZLE	BGN7	Rubber tipped nozzle for delicate surfaces and for blowing out fluid lines	(*)	-	-
BG2X3 LEVER GUN W/NOZZLE	BGX3	Extension nozzle (3 inch) for extending reach	15	21	85.5
BG2X6 LEVER GUN W/NOZZLE	BGX6	Extension nozzle (6 inch) for extending reach	14.1	22	84
BG2X12 LEVER GUN W/NOZZLE	BGX12	Extension nozzle (12 inch) for extending reach	13.3	24	85.5
BG4X12 PISTOL GUN W/NOZZLE					
-	BGN2	Flexible extension nozzle (4 inch)	-	-	-
-	BGN3	Flexible extension nozzle (12 inch)	-	-	-
BG-CPLR LEVER GUN W/NOZZLE	BGADP	Quick change nozzle adapter	-	-	-

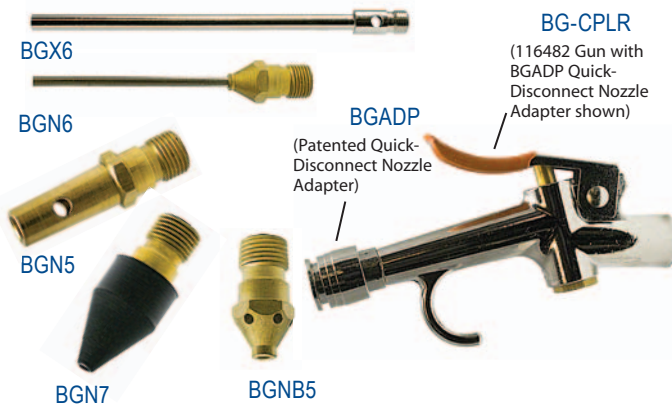
\* WARNING: To be OSHA compliant, non-relieving nozzles may only be used when the blowgun's inlet pressure is regulated to 30 PSI maximum.



## Blow Gun Kit

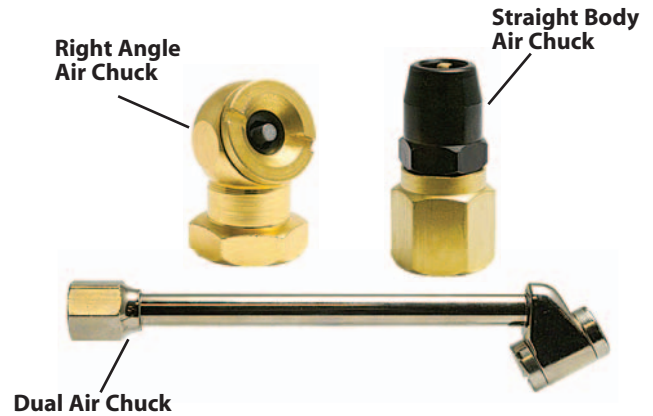
The BRECO BGQKIT contains five of the most popular nozzles for industrial and automotive uses. This kit includes a high quality, lever-operated heavy-duty blow gun featuring a patented quick disconnect nozzle adapter which allows users to switch nozzles quickly and easily. This multi-use kit contains a high flow safety nozzle, six inch extension safety nozzle, rubber tip nozzle, needle tip nozzle, and air-screen safety nozzle. For handy storage, a clear vinyl compartmented snap pouch is included. Ideally suited as a counter sale product.

To Order Complete Kit Use Part Number - BGQKIT



## Air Chucks

Three BRECO Air Chucks are available: a right angle heavy-duty air chuck, a heavy duty straight body air chuck, and a dual air chuck for all your air fill needs. All three air chucks have 1/4" FPT inlets.



PART No.	DESCRIPTION
AC40	Right Angle Air Chuck, 1/4" FPT
AC42	Dual Air Chuck
AC45	Straight Body Air Chuck, 1/4" FPT

## Safety Blow Gun B-8003

The BRECO Blow gun provides greater force for chip removal with less air consumption...saving energy without loss of performance. The features of this low cost blow gun offer top performance for any application.

**Easy Operation:** Thumb lever operation allows operator to have maximum control. Hooked shaped body for convenient storage when not in use. Built-in orifice and tamper resistant relieved tip prevents pressure buildup above 29 PSIG if nozzle is obstructed.

### Specifications:

**Inlet Sizes:** 1/4" NPT

**Temp. Range:** 32° to 175° (0 to 79°C) Max

**Inlet Pressure:** 180 PSIG (12 bar)

**Regulated Pressure:** 29 PSIG (2 bar) Max

**Weight:** 2.07 oz.

**Caution:** These blow guns should not be used for fluids other than air, nor in applications which may exceed maximum recommended operating conditions.



Add versatility to your compressed air systems and simplify multiple tool operations. The BRECO 3-Way Hose Manifolds allow three work stations to use the same air supply. Featuring a port design to maximize air flow through the body for less restriction on flow than other similar products on the market. Each manifold accepts three quick couplers or outlet hoses. Manifold has female NPT inlet and three female NPT outlets. Manifolds are available in three different inlet/outlet sizes.



3-Way Flat Manifold



3-Way Manifold

PART No.	DESCRIPTION	INLET	OUTLET
301787.01 (B-3404)	3-Way Manifold	1/4"	1/4"
301805 (B-3406)		3/8"	1/4"
301820		1/2"	3/8"
6124-A	3-Way Flat Manifold	1/4"	1/4"

### 3-WAY Hose Manifold

### 3-WAY Hose Manifold with Sockets and Swivel Plugs

An expanded style of our 3-Way Hose Manifold is available pre-assembled with a choice of three D Series manual sockets or three swivel plugs. This operational versatility allows three independent work stations to function with the same air supply. The port design

of the BRECO 3-Way Hose Manifold maximizes air flow through the body and is less restrictive on flow than other similar products on the market. The flexibility of quick disconnects, swivel plugs, or outlet hoses maximizes air operations while improving efficiencies.



3-Way Manifold Shown



Free swivel under pressure eliminates hose twist

PART No.	DESCRIPTION	INLET	OUTLET
MAN2525A	3-Way Manifold with three D341 Sockets	1/4" FPT	Sockets 1/4" Industrial Interchange
MAN3825A	3-Way Manifold with three D341 Sockets	3/8" FPT;	Sockets 1/4" Industrial Interchange
MAN5038A	3-Way Manifold with three D461 Sockets	1/2" FPT	Sockets 3/8" Industrial Interchange
6124	Flat Manifold w/ 3 sockets & 1 plug (Industrial)	1/4" plug	1/4" sockets
MF-2	Manifold w/ 3 sockets & 1 plug (Industrial)	1/4" plug	1/4" sockets
MF-3	Manifold w/ 3 sockets & 1 plug (Industrial)	3/8" plug	3/8" sockets

PART No.	DESCRIPTION	INLET	OUTLET
MAN2525S*	3-Way Manifold with three Swivel Plugs	1/4" FPT	Swivel Plug 1/4" Industrial Interchange
MAN3825S*		3/8" FPT	Swivel Plug 1/4" Industrial Interchange
MAN5038S*		1/2" FPT;	Swivel Plug 3/8" Industrial Interchange
* Note: Swivel Plugs are OPEN. Connection is needed to avoid leak path.			



# Polyurethane Recoil Hose



Fully Assembled and Ready to Use Configurations with and without DW-Series Universal Sockets Includes Swivel NPT Fitting End Pre-Installed with Thread Compound 15' and 25' Lengths

BRECO Polyurethane Recoil Hose has greater durability than other types of hose due to exceptional wear characteristics. Polyurethane Recoil Hose is kink resistant and has exceptional memory characteristics due to elastic properties of the polyurethane hose. Hoses are pre-assembled with reusable brass fittings for reduced assembly time.



Two assembly configurations include BRECO DW Series Universal Sockets ready for connection to air tools or other accessories. The BRECO Polyurethane Recoil Hose products are pre-bagged for convenience. Ideally suited as counter sale products.

## Features:

- Greater durability than other recoil hoses due to exceptional wear characteristics
- Longer life expectancy due to kink resistant properties
- Superior recoil memory due to elastic properties
- Pre-assembled and ready to use

## Specifications

- Construction: Yellow polyurethane recoil hose with reusable brass fitting ends Inlet end includes in-line brass swivel fitting
- Working Pressure: 170 PSIG @ 75F
- Temperature Range: -40F to +125F
- Working Length: 80-90% of hose length



PART No.	I.D. x O.D.	LENGTH	MPT FITTINGS
DCPOLY15	1/4" x 3/8"	15'	1/4" Rigid x 1/4" Swivel
DCPOLY25	1/4" x 3/8"	25'	1/4" Rigid x 1/4" Swivel
DCPOLY15ASSY	1/4" x 3/8"	15'	DW340A Universal Socket x 1/4" Swivel
DCPOLY25ASSY	1/4" x 3/8"	25'	DW340A Universal Socket x 1/4" Swivel

Pressurized lines employing quick-disconnect couplers should be considered potentially hazardous and must be used with safety in mind. Proper selection and use of appropriate couplers will help you maintain a safe working environment for personnel, equipment, and products.

BRECO quick-disconnect couplers are precision devices—do not modify, strike, or otherwise abuse the coupling halves. Never exceed the pressure or temperature limits and always protect the hose and coupler assembly from moving equipment.

Be cautious when moving pressurized hoses as some types of quick-disconnect couplers may unintentionally disconnect if the coupler

encounters an obstacle as the hose is dragged. The pressurized media subsequently escaping from the freed line can force the hose assembly to violently whip about, possibly causing personal injury, equipment/product damage, and economic loss. BRECO Safety Vent couplers and plugs, designed to minimize hose whip hazards, should be used wherever the risk is present. Personnel must be instructed to maintain a firm grip on both coupler halves when connecting or disconnecting pressurized lines.

Above all, always wear appropriate personal protection equipment and safety glasses when working with, or near, pressurized lines utilizing quick-disconnect couplers.

## Safety Vent Couplers

BRECO Safety Vent couplers are designed to minimize the possibility of inadvertent disconnection and potentially hazardous hose whip. BRECO SV and SVPC Series Safety Vent couplers are "zero pressure" connect/disconnect type couplers designed to safely vent downstream pressure prior to disengaging the plug.

### BRECO SVPC and SV Series Safety Vent Couplers

Safety Vent couplers are nearly effortless to connect and great for hose use. They are also especially useful for single-hand operation when they are mounted to hard lines such as an overhead air drop. Once inserted into the SV socket, the plug is lightly gripped and will stay in place allowing the operator to use the same hand to slide the sleeve straight forward to the "on" position. As the sleeve is being moved to the "on" position, the SV socket will securely lock the plug in place and then turn the flow "on".

SV Series sockets can also be used as a 3-way valve to turn off the flow of air and exhaust the downstream pressure without disengaging the plug. By turning and sliding the sleeve to the "exhaust" position, downstream air pressure is relieved but the plug remains locked in place. Turning and sliding the sleeve in the opposite direction allows air to flow again.

BRECO SV Series couplers are the ultimate solution to accidental disconnect hose whip dangers.

### BRECO SVPC Series Safety Vent Couplers

The SVPC Series Safety Vent couplers provide the same safety vent features as the SV Series, and are plastic encapsulated to prevent scratching or marring of finished or fragile surfaces. The SVPC Series sockets will prevent plug release until the downstream line pressure is vented to atmosphere and the plug can be safely removed.

## Ball-Lock Option

"Ball-Lock" (BL) option employs a ball or pin to restrict sleeve retraction and is available on BRECO D Series and DM Series sockets. Couplers with the BL designation are constructed with sleeves having a slot that must be aligned with a ball or pin before the sleeve is allowed to retract. Rotating the sleeve 180 degrees so the slot is not aligned with the ball or pin will minimize the chance of accidental sleeve retraction.

## Ball Check Plugs

Ball check plugs are offered in several sizes of Industrial Interchange plugs. Ball check plugs have a free-floating internal ball that acts as a check valve when the plug is disconnected from the coupler. The check valve action minimizes hose whip by causing the pressurized gas to escape slowly from the disconnected hose.

## Air Blowguns

BRECO Blow Gun products are designed for cleaning, blow-off, inflation, and other operations. The blowguns are available with zinc or nylon bodies with a variety of optional nozzles for nearly any use. BRECO Blow Gun tips are available in OSHA compliant and (\*) non-compliant models to suit your particular needs.

Blow Guns and nozzles that comply with OSHA regulations will limit the pressure of air exiting the nozzle to less than 30 PSIG when the nozzle is dead-headed.

*(\*) Note: If a non-OSHA compliant blow gun nozzle (BGN6, or BGN7) is used, air pressure to the gun's inlet must be regulated to less than 30 PSIG to meet OSHA regulations.*

We strongly recommend that the end user obtain proper training before using quick-disconnect couplers, air blowguns, and other BRECO products. Thoughtful analysis of the user's needs and application must be given before selecting a product.

Our dedicated employees and distributors are eager to explain the features, benefits, and proper selection of BRECO products, and answer your questions regarding their correct application and safe use.

Pneumatic Systems	B
	C, D
	SV, SVPC, Int Plugs
	J, L
Hydraulic Systems	O, DW, U
	TL, DR
	DS, 4000
	6100, FF
Miscellaneous	6600, W
	ST, H
	Mold
	Garden, Lubricator
Air Line Products	Pipe Fittings
	Blow Guns
Hose, Safety	



## Aeroquip to BRECO Interchange

5100-S2-12B	B-6105-12	5657-12	B-6657-12	FD42-1002-04-04	B-4010-2P	FD45-1004-16-16	DS8F8-SS
5100-S2-16B	B-6105-16	5657-16	B-6657-16	FD43-1001-02-04	B-2CF1-B	FD45-1005-04-04	2DSF2-SS
5100-S2-20B	B-6105-20	5657-4	B-6657-4	FD43-1001-02-04	D320	FD45-1005-06-06	3DSF3-SS
5100-S2-24B	B-6105-24	5657-6	B-6657-6	FD43-1001-04-04	B-2CF2-B	FD45-1005-08-10	4DSF4-SS
5100-S5-12B	B-6125-12	5659-10	B-6659-10	FD43-1001-04-04	D340	FD45-1005-12-12	6DSF6-SS
5100-S5-12B	B-6115-12	5659-12	B-6659-12	FD43-1001-04-06	B-3CF2-S	FD45-1005-16-16	8DSF8-SS
5100-S5-16B	B-6125-16	5659-16	B-6659-16	FD43-1001-04-06	D440	FD45-1040-02	BH1-66M
5100-S5-16B	B-6115-16	5659-4	B-6659-4	FD43-1001-06-04	B-2CF3-B	FD45-1040-04	BH2-66M
5100-S5-20B	B-6125-20	5659-6	B-6659-6	FD43-1001-06-04	D360	FD45-1040-06	BH3-66M
5100-S5-20B	B-6115-20	FD40-1000-02-04	B-2BF1-B	FD43-1001-06-06	B-3CF3-S	FD45-1040-10	BH4-66M
5100-S5-24B	B-6125-24	FD40-1000-04-04	B-2BF2-B	FD43-1001-06-06	D460	FD45-1040-12	BH6-66M
5100-S5-24B	B-6115-24	FD40-1000-04-06	B-3BF2-B	FD43-1011-02-04	B-2CM1-B	FD45-1040-16	BH8-66M
5101-12B	B-6100-12	FD40-1000-06-04	B-2BF3-B	FD43-1011-02-04	D321	FD45-1041-02	BH1-65M
5101-12B	B-6120-12	FD40-1000-06-06	B-3BF3-B	FD43-1011-04-04	B-2CM2-B	FD45-1041-04	BH2-65M
5101-16B	B-6100-16	FD40-1000-08-06	B-3BF4-B	FD43-1011-04-04	D341	FD45-1041-06	BH3-65M
5101-16B	B-6120-16	FD40-1000-08-08	B-4BF4-B	FD43-1011-04-06	B-3CM2-S	FD45-1041-10	BH4-65M
5101-20B	B-6100-20	FD40-1001-02-04	B-2BM1-B	FD43-1011-04-06	D441	FD45-1041-12	BH6-65M
5101-20B	B-6120-20	FD40-1001-04-04	B-2BM2-B	FD43-1011-06-04	B-2CM3-B	FD45-1041-16	BH8-65M
5101-24B	B-6100-24	FD40-1001-04-06	B-3BM2-B	FD43-1011-06-04	D361	FD45-1046-04-04	DS2F2-BI
5101-24B	B-6120-24	FD40-1001-06-04	B-2BM3-B	FD43-1011-06-06	B-3CM3-S	FD45-1086-02-02	DS1F1-B
5110-S5-12B	B-6135-12	FD40-1001-06-06	B-3BM3-B	FD43-1011-06-06	D461	FD45-1086-04-04	DS2F2-B
5110-S5-16B	B-6135-16	FD40-1001-08-06	B-3BM4-B	FD43-1011-08-06	B-3CM4-S	FD45-1086-06-06	DS3F3-B
5110-S5-20B	B-6135-20	FD40-1001-08-08	B-4BM4-B	FD43-1011-08-06	D481	FD45-1086-08-10	DS4F4-B
5110-S5-24B	B-6135-24	FD40-1013-02-04	B-B2F1-S	FD43-1011-08-08	B-4CM4-S	FD45-1086-12-12	DS6F6-B
5601-12-10S	B-6601-12-10	FD40-1013-04-04	B-B2F2-S	FD43-1011-08-08	D581	FD45-1086-16-16	DS8F8-B
5601-12-12S	B-6601-12-12	FD40-1013-06-04	B-B2F3-S	FD43-1013-08-06	B-3CF4-S	FD45-1101-02-02	1DSF1-B
5601-16-16S	B-6601-16-16	FD40-1013-06-06	B-B3F3-S	FD43-1013-08-08	B-4CF4-S	FD45-1101-04-04	2DSF2-B
5601-2-4S	B-6601-2-4	FD40-1013-08-06	B-B3F4-S	FD43-1013-08-08	D580	FD45-1101-06-06	3DSF3-B
5601-4-4S	B-6601-4-4	FD40-1013-08-08	B-B4F4-S	FD43-1031-04-04	B-2CPS2-B	FD45-1101-08-10	4DSF4-B
5601-6-6S	B-6601-6-6	FD40-1014-02-04	B-B2M1-S	FD43-1031-04-04	D344	FD45-1101-12-12	6DSF6-B
5601-8-10S	B-6601-8-10	FD40-1014-04-04	B-B2M2-S	FD43-1031-06-04	B-2CPS3-B	FD45-1101-16-16	8DSF8-B
5602-12-10S	B-6602-12-10	FD40-1014-04-06	B-B3M2-S	FD43-1031-06-04	D364	FD45-1206-04-04	2DSF2-BI
5602-12-12S	B-6602-12-12	FD40-1014-06-04	B-B2M3-S	FD45-1002-02-02	DS1F1-S	FD89-1001-06-06	B-3FF3-FP
5602-16-16S	B-6602-16-16	FD40-1014-06-06	B-B3M3-S	FD45-1002-04-04	DS2F2-S	FD89-1001-08-08	B-3FF4-FP
5602-2-4S	B-6602-2-4	FD40-1014-06-08	B-B4M3-S	FD45-1002-06-06	DS3F3-S	FD89-1001-08-08	B-4FF4-FP
5602-4-4S	B-6602-4-4	FD40-1014-08-06	B-B3M4-S	FD45-1002-08-10	DS4F4-S	FD89-1001-12-08	B-4FF6-FP
5602-6-6S	B-6602-6-6	FD40-1014-08-08	B-B4M4-S	FD45-1002-12-12	DS6F6-S	FD89-1001-12-12	B-6FF6-FP
5602-8-10S	B-6602-8-10	FD40-1016-04-04	B-B2PS2-S	FD45-1002-16-16	DS8F8-S	FD89-1002-06-06	B-FF3F3-FP
5608-12-10S	B-6608-12-10	FD40-1016-06-06	B-B3PS3-S	FD45-1003-02-02	1DSF1-S	FD89-1002-08-08	B-FF3F4-FP
5608-12-12S	B-6608-12-12	FD40-1016-08-08	B-B4PS4-S	FD45-1003-04-04	2DSF2-S	FD89-1002-08-08	B-FF4F4-FP
5608-16-16s	B-6608-16-16	FD40-1019-04-04	B-B2S2-S	FD45-1003-06-06	3DSF3-S	FD89-1002-12-08	B-FF4F6-FP
5608-8-10S	B-6608-8-10	FD40-1019-06-06	B-B3S3-S	FD45-1003-08-10	4DSF4-S	FD89-1002-12-12	B-FF6F6-FP
5610-10-10S	B-6610-10-10	FD40-1019-08-08	B-B4S4-S	FD45-1003-12-12	6DSF6-S		
5610-12-10S	B-6610-12-10	FD41-1000-04-04	B-2OF2-B	FD45-1003-16-16	8DSF8-S		
5610-12-12S	B-6610-12-12	FD41-1000-06-04	B-2OF3-B	FD45-1004-04-04	DS2F2-SS		
5610-16-16a	B-6610-16-16	FD41-1013-04-04	B-O2F2-S	FD45-1004-06-06	DS3F3-SS		
5610-8-10S	B-6610-8-10	FD41-1014-04-04	B-O2M2-S	FD45-1004-08-10	DS4F4-SS		
5657-10	B-6657-10	FD42-1001-04-04	B-4050-2P	FD45-1004-12-12	DS6F6-SS		

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## Amflo to BRECO Interchange

C10	B-4CF4-S	C25-04	B-3CM4-S	C6-44L	B-3JPS3-S	CP2	B-J2F2-S	CP2B	B-J2F2-B	CPST8	ST4F4-S
C10	D580	C26	B-3CF3-S	C6-45	B-3JS4-S	CP2-23	B-J2F3-S	CP35	B-O3M3-S	CST1B	1STM1-B
C10-23	B-4CF3-S	C26	D460	C60	B-2UF2-B	CP20	B-B2F2-S	CP36	B-O3F3-S	CST2B	1STF1-B
C10-23	D560	C26-22	B-3CF2-S	C60	DW340A	CP20-23	B-B2F3-S	CP37	B-O2M2-S	CST3B	2STM2-B
C10-45	B-4CS4-S	C26-22	D440	C61	B-2UM2-B	CP20B	B-B2F2-B	CP38	B-O2F2-S	CST4B	2STF2-B
C10-45	D582	C26-24	B-3CF4-S	C61	DW341A	CP21	B-B2M2-S	CP5	B-J3M3-S	CST5B	3STM3-B
C1B	B-2JM2-B	C26-24	D480	C7	B-3JM2-S	CP21-03	B-B2M3-S	CP5-44	B-J3S3-S	CST6B	3STF3-B
C2-23B	B-2JF3-B	C26-44	B-3CS3-S	C8	B-3JF2-S	CP21-42	B-B2S2-S	CP5-44L	B-J3PS3-S	CST7B	4STM4-B
C2-42B	B-2JS2-B	C26-44	D462	C9	B-4CM4-S	CP21-42L	B-B2PS2-S	CP6	B-J3F3-S	CST8B	4STF4-B
C20-23B	B-2CF3-B	C26-44L	B-3CPS3-S	C9	D581	CP21-44	B-B2S3-S	CP7	B-J3M2-S		
C20-23B	D360	C26-44L	D464	C9-03	B-4CM3-S	CP21-44L	B-B2PS3-S	CP8	B-J3F2-S		
C20-42B	B-2CS2-B	C26-45	B-3CS4-S	C9-03	D561	CP21B	B-B2M2-B	CPST1	ST1M1-S		
C20-42B	D342	C26-45	D482	CP1	B-J2M2-S	CP25	B-B3M3-S	CPST1B	ST1M1-B		
C20-44B	B-2CS3-B	C28	B-2LF2-B	CP1-03	B-J2M3-S	CP25-02	B-B3M2-S	CPST2	ST1F1-S		
C20-44B	D362	C2B	B-2JF2-B	CP1-42	B-J2S2-S	CP25-04	B-B3M4-S	CPST2B	ST1F1-B		
C20B	B-2CF2-B	C35	B-30M3-S	CP1-42L	B-J2PS2-S	CP25-42L	B-B3PS2-S	CPST3	ST2M2-S		
C20B	D340	C36	B-30F3-S	CP1-44	B-J2S3-S	CP25-44	B-B3S3-S	CPST3B	ST2M2-B		
C21-03B	B-2CM3-B	C45	B-20M2-S	CP1-44L	B-J2PS3-S	CP25-44L	B-B3PS3-S	CPST4	ST2F2-S		
C21-03B	D361	C46	B-20F2-S	CP17	B-B4M4-S	CP25-45	B-B3S4-S	CPST4B	ST2F2-B		
C21B	B-2CM2-B	C5	B-3JM3-S	CP17-03	B-B4M3-S	CP26	B-B3F3-S	CPST5	ST3M3-S		
C21B	D341	C5-04	B-3JM4-S	CP17-45	B-B4S4-S	CP26-22	B-B3F2-S	CPST5B	ST3M3-B		
C25	B-3CM3-S	C6	B-3JF3-S	CP18	B-B4F4-S	CP26-24	B-B3F4-S	CPST6	ST3F3-S		
C25-02	B-3CM2-S	C6-24	B-3JF4-S	CP18-23	B-B4F3-S	CP27	B-L2M2-S	CPST6B	ST3F3-B		
C25-02	D441	C6-44	B-3JS3-S	CP1B	B-J2M2-B	CP28	B-L2F2-S	CPST7	ST4M4-S		

## Coilhoose to BRECO Interchange

1101STB	ST2M2-B	122	B-4CM4-S	1503	B-B2M3-S	156A	B-2BS3-B	1701	B-L2M2-S	586	B-3CS3-S
1101STS	ST2M2-S	122	D581	1504	B-B2M1-S	156AL	B-2BPS3-B	1702	B-L2F2-S	586	D462
1102STB	ST2F2-B	122A	B-4BM4-B	1505	B-B2F3-S	156L	B-2CPS3-B	3401	B-B6M6-S	586A	B-3BS3-B
1102STS	ST2F2-S	123	B-4CF3-S	1506	B-B2S2-S	156L	D364	3402	B-B6F6-S	586AL	B-3BPS3-B
1103STB	ST3M3-B	123	D560	1506L	B-B2PS2-S	158	B-2CF1-B	340A	B-6BF6-B	586L	B-3CPS3-S
1103STS	ST3M3-S	123A	B-4BF3-B	1508	B-B2S3-S	158	D320	342A	B-6BM6-B	586L	D464
1105STB	ST3F3-B	127	B-4CS3-S	1508L	B-B2PS3-S	158A	B-2BF1-B	343A	B-6BS6-B	587	B-3CM4-S
1105STS	ST3F3-S	127	D562	1509	B-B2F1-S	159	B-2CM1-B	580	B-3CF3-S	587A	B-3BM4-B
1109STB	ST4M4-B	128	B-4CS4-S	150A	B-2BF2-B	159	D321	580	D460	588	B-3CS4-S
1109STS	ST4M4-S	128	D582	150U	B-2UF2-B	159A	B-2BM1-B	5801	B-B3M3-S	588	D482
110ST	2STF2-B	128A	B-4BS4-B	150U	DW340A	160	B-2JF2-B	5802	B-B3F3-S	590	B-3JF3-S
1110STB	ST4F4-B	128A	B-3BS4-B	151	B-2CF3-B	1601	B-J2M2-S	5803	B-B3M2-S	5901	B-J3M3-S
1110STS	ST4F4-S	128AL	B-4BPS4-B	151	D360	1601B	B-J2M2-B	5804	B-B3F2-S	5902	B-J3F3-S
111ST	3STF3-B	140	B-20F2-B	151A	B-2BF3-B	1602	B-J2F2-S	5805	B-B3F4-S	5903	B-J3M2-S
112ST	2STM2-B	1401	B-O2M2-S	152	B-2CM2-B	1602B	B-J2F2-B	5806	B-B3S3-S	5904	B-J3F2-S
115ST	3STM3-B	1402	B-O2F2-S	152	D341	1603	B-J2M3-S	5806L	B-B3PS3-S	5906	B-J3S3-S
117ST	4STF4-B	1403	B-O2M3-S	152A	B-2BM2-B	1604	B-J2M1-S	5808	B-B3S4-S	5906L	B-J3PS3-S
119ST	4STM4-B	1404	B-O2M1-S	152U	B-2UM2-B	1605	B-J2F3-S	5809	B-B3M4-S	591	B-3JM3-S
120	B-4CF4-S	1405	B-O2F3-S	152U	DW341A	1606	B-J2S2-S	580A	B-3BF3-B	592	B-3JF2-S
120	D580	1406	B-O2S2-S	153	B-2CS2-B	1606L	B-J2PS2-S	581	B-3CM3-S	593	B-3JM2-S
1201	B-B4M4-S	141	B-20F3-B	153	D342	1608	B-J2S3-S	581A	B-3BM3-B	598	B-3JS3-S
1202	B-B4F4-S	142	B-20M2-B	153A	B-2BS2-B	1608L	B-J2PS3-S	582	B-3CF2-S	598L	B-3JPS3-S
1203	B-B4M3-S	143	B-20S2-B	153AL	B-2BPS2-B	161	B-2JF3-B	582	D440		
1204	B-B4F3-S	145	B-20M3-B	153L	B-2CPS2-B	162	B-2JM2-B	582A	B-3BF2-B		
1207	B-B4S3-S	150	B-2CF2-B	153L	D344	163	B-2JS2-B	583	B-3CM2-S		
1208	B-B4S4-S	150	D340	155	B-2CM3-B	163L	B-2JPS2-B	583	D441		
120A	B-4BF4-B	1501	B-B2M2-S	155	D361	165	B-2JM3-B	583A	B-3BM2-B		
121	B-4CM3-S	1501-B	B-B2M2-B	155A	B-2BM3-B	166	B-2JS3-B	584	B-3CF4-S		
121A	D561	1502	B-B2F2-S	156	B-2CS3-B	166L	B-2JPS3-B	584	D480		
121A	B-4BM3-B	1502B	B-B2F2-B	156	D362	170	B-2LF2-B	584A	B-3BF4-B		

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## Dixon to BRECO Interchange [PAGE 1 OF 2]

16-263	2DSF2-S	79-1200	B-6105-24	DC242	B-2JS2-B	DC903	B-4CM3-S	DCP2142L	B-B2PS2-S
16-363	3DSF3-S	79-600	B-6105-12	DC242L	B-2JPS2-B	DC903	D561	DCP2144	B-B2S3-S
16-463	4DSF4-S	79-800	B-6105-16	DC244	B-2JS3-B	DCB10	B-4BF4-B	DCP2144L	B-B2PS3-S
16-663	6DSF6-S	8HTF8	B-8FF8-FP	DC244L	B-2JPS3-B	DCB1023	B-4BF3-B	DCP21B	B-B2M2-B
16-863	8DSF8-S	B16-263	2DSF2-B	DC25	B-3CM3-S	DCB1026	B-4BF6-B	DCP21S	B-B2M2-SS
17-263	DS2F2-S	B16-363	3DSF3-B	DC2502	B-3CM2-S	DCB1044	B-4BS3-B	DCP221	B-J2F1-S
17-363	DS3F3-S	B16-463	4DSF4-B	DC2502	D441	DCB1045	B-4BS4-B	DCP223	B-J2F3-S
17-463	DS4F4-S	B16-663	6DSF6-B	DC2504	B-3CM4-S	DCB1046	B-4BS6-B	DCP25	B-B3M3-S
17-663	DS6F6-S	B16-863	8DSF8-B	DC26	B-3CF3-S	DCB20	B-2BF2-B	DCP2502	B-B3M2-S
17-863	DS8F8-S	B17-263	DS2F2-B	DC26	D460	DCB2023	B-2BF3-B	DCP2504	B-B3M4-S
18-300	B-4050-3	B17-363	DS3F3-B	DC2622	B-3CF2-S	DCB2042	B-2BS2-B	DCP2542L	B-B3PS2-S
18-400	B-4050-4	B17-463	DS4F4-B	DC2622	D440	DCB2044	B-2BS3-B	DCP2544	B-B3S3-S
18-415	B-4050-15	B17-663	DS6F6-B	DC2624	B-3CF4-S	DCB21	B-2BM2-B	DCP2544L	B-B3PS3-S
18-600	B-4050-5	B17-863	DS8F8-B	DC2624	D480	DCB2103	B-2BM3-B	DCP2545	B-B3S4-S
18-660	B-4150-5	DC1	B-2JM2-B	DC2644	B-3CS3-S	DCB25	B-3BM3-B	DCP26	B-B3F3-S
18-800	B-4050-6	DC10	B-4CF4-S	DC2644	D462	DCB2502	B-3BM2-B	DCP2622	B-B3F2-S
19-300	B-4010-3	DC10	D580	DC2644L	B-3CPS3-S	DCB2504	B-3BM4-B	DCP2624	B-B3F4-S
19-400	B-8010-4	DC1023	B-4CF3-S	DC2644L	D464	DCB26	B-3BF3-B	DCP27	B-L2M2-S
19-415	B-8010-15	DC1023	D560	DC2645	B-3CS4-S	DCB2622	B-3BF2-B	DCP28	B-L2F2-S
19-600	B-8010-5	DC103	B-2JM3-B	DC2645	D482	DCB2624	B-3BF4-B	DCP35	B-O3M3-S
19-660	B-4110-5	DC1044	B-4CS3-S	DC28	B-2LF2-B	DCB2644	B-3BS3-B	DCP36	B-O3F3-S
19-800	B-4010-6	DC1044	D562	DC35	B-3OM3-S	DCB2645	B-3BS4-B	DCP37	B-O2M2-S
30-200	B-2WM2-S	DC1045	B-4CS4-S	DC36	B-3OF3-S	DCB9	B-4BM4-B	DCP3703	B-O2M3-S
30-300	B-3WM3-S	DC1045	D582	DC37	B-2OM2-B	DCB903	B-4BM3-B	DCP3742	B-O2S2-S
30-300F	B-3WF3-S	DC1046	B-4CS6-S	DC3703	B-2OM3-B	DCB906	B-4BM6-B	DCP3742L	B-O2PS2-S
31-200	B-W2F2-S	DC1046	D5122	DC38	B-2OF2-B	DCP1	B-J2M2-S	DCP3744	B-O2S3-S
31-300	B-W3F3-S	DC2	B-2JF2-B	DC3823	B-2OF3-B	DCP101	B-J2M1-S	DCP38	B-O2F2-S
3HTF3	B-3FF3-FP	DC20	B-2CF2-B	DC3842	B-2OS2-B	DCP103	B-J2M3-S	DCP3823	B-O2F3-S
3HTF4	B-3FF4-FP	DC20	D340	DC3842L	B-2OPS2-B	DCP142	B-J2S2-S	DCP5	B-J3M3-S
4HTF4	B-4FF4-FP	DC2021	B-2CF1-B	DC3844	B-2OS3-B	DCP142L	B-J2PS2-S	DCP544	B-J3S3-S
4HTF6	B-4FF6-FP	DC2021	D320	DC3844L	B-2OPS3-B	DCP144	B-J2S3-S	DCP544L	B-J3PS3-S
56-100	B-6601-2-4	DC2023	B-2CF3-B	DC5	B-3JM3-S	DCP144L	B-J2PS3-S	DCP6	B-J3F3-S
56-200	B-6601-4-4	DC2023	D360	DC504	B-3JM4-S	DCP17	B-B4M4-S	DCP7	B-J3M2-S
56-300	B-6601-6-6	DC2042	B-2CS2-B	DC6	B-3JF3-S	DCP1703	B-B4M3-S	DCP7024	B-B6F4-S
56-400	B-6601-8-10	DC2042	D342	DC624	B-3JF4-S	DCP1706	B-B4M6-S	DCP7026	B-B6F6-S
56-600	B-6601-12-10	DC2042L	B-2CPS2-B	DC644	B-3JS3-S	DCP1744	B-B4S3-S	DCP7028	B-B6F8-S
56-660	B-6601-12-12	DC2042L	D344	DC644L	B-3JPS3-S	DCP1745	B-B4S4-S	DCP7104	B-B6M4-S
56-800	B-6601-16-16	DC2044	B-2CS3-B	DC645	B-3JS4-S	DCP1746	B-B4S6-S	DCP7106	B-B6M6-S
57-100	B-6602-2-4	DC2044	D362	DC7	B-3JM2-S	DCP18	B-B4F4-S	DCP7108	B-B6M8-S
57-200	B-6602-4-4	DC2044L	B-2CPS3-B	DC7024	B-6BF4-B	DCP1823	B-B4F3-S	DCP7145	B-B6S4-S
57-300	B-6602-6-6	DC2044L	D364	DC7028	B-6BF6-B	DCP1826	B-B4F6-S	DCP7146	B-B6S6-S
57-400	B-6602-8-10	DC20S	B-2CF2-SS	DC7028	B-6BF8-B	DCP2	B-J2F2-S	DCP7148	B-B6S8-S
57-600	B-6602-12-10	DC21	B-2CM2-B	DC7045	B-6BS4-B	DCP20	B-B2F2-S	DCP8	B-J3F2-S
57-660	B-6602-12-12	DC21	D341	DC7046	B-6BS6-B	DCP2021	B-B2F1-S	HT3F3	B-FF3F3-FP
57-800	B-6602-16-16	DC2101	B-2CM1-B	DC7048	B-6BS8-B	DCP2023	B-B2F3-S	HT3F4	B-FF3F4-FP
6HTF6	B-6FF6-FP	DC2101	D321	DC7104	B-6BM4-B	DCP20B	B-B2F2-B	HT4F4	B-FF4F4-FP
78-1000	B-6125-20	DC2103	B-2CM3-B	DC7106	B-6BM6-B	DCP20S	B-B2F2-SS	HT4F6	B-FF4F6-FP
78-1200	B-6125-24	DC2103	D361	DC7108	B-6BM8-B	DCP21	B-B2M2-S	HT6F6	B-FF6F6-FP
78-600	B-6125-12	DC21S	B-2CM2-SS	DC8	B-3JF2-S	DCP2101	B-B2M1-S	HT8F8	B-FF8F8-FP
78-800	B-6125-16	DC221	B-2JF1-B	DC9	B-4CM4-S	DCP2103	B-B2M3-S	SS16-263	2DSF2-SS
79-1000	B-6105-20	DC223	B-2JF3-B	DC9	D581	DCP2142	B-B2S2-S	SS16-363	3DSF3-SS

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## Dixon to BRECO Interchange [PAGE 2 OF 2]

SS16-463	4DSF4-SS	STFP2	ST2F2-S	STMC3SS	3STM3-SS	STMP6SS	ST6M6-SS	VHN300	B-VHN6-6F
SS16-663	6DSF6-SS	STFP2B	ST2F2-B	STMC4	4STM4-B	STMP8	ST8M8-S	VHN300B	B-VHN6-6F-B
SS16-863	8DSF8-SS	STFP2SS	ST2F2-SS	STMC4SS	4STM4-SS	STMP8B	ST8M8-B	VHN400	B-VHN8-8F
SS17-263	DS2F2-SS	STFP3	ST3F3-S	STMC6	6STM6-B	STMP8SS	ST8M8-SS	VHN400B	B-VHN8-8F-B
SS17-363	DS3F3-SS	STFP3B	ST3F3-B	STMC6SS	6STM6-SS	UDC20	B-2UF2-B	VHN600	B-VHN12-12F
SS17-463	DS4F4-SS	STFP3SS	ST3F3-SS	STMC8	8STM8-B	UDC20	DW340A	VHN600B	B-VHN12-12F-B
SS17-663	DS6F6-SS	STFP4	ST4F4-S	STMC8SS	8STM8-SS	UDC21	B-2UM2-B		
SS17-863	DS8F8-SS	STFP4B	ST4F4-B	STMP2	ST2M2-S	UDC21	DW341A		
STFC2	2STF2-B	STFP4SS	ST4F4-SS	STMP2B	ST2M2-B	VHC200	B-VHC4-4F		
STFC2SS	2STF2-SS	STFP6	ST6F6-S	STMP2SS	ST2M2-SS	VHC200B	B-VHC4-4F-B		
STFC3	3STF3-B	STFP6B	ST6F6-B	STMP3	ST3M3-S	VHC300	B-VHC6-6F		
STFC3SS	3STF3-SS	STFP6SS	ST6F6-SS	STMP3B	ST3M3-B	VHC300B	B-VHC6-6F-B		
STFC4	4STF4-B	STFP8	ST8F8-S	STMP3SS	ST3M3-SS	VHC400	B-VHC8-8F		
STFC4SS	4STF4-SS	STFP8B	ST8F8-B	STMP4	ST4M4-S	VHC400B	B-VHC8-8F-B		
STFC6	6STF6-B	STFP8SS	ST8F8-SS	STMP4B	ST4M4-B	VHC600	B-VHC12-12F		
STFC6SS	6STF6-SS	STMC2	2STM2-B	STMP4SS	ST4M4-SS	VHC600B	B-VHC12-12F-B		
STFC8	8STF8-B	STMC2SS	2STM2-SS	STMP6	ST6M6-S	VHN200	B-VHN4-4F		
STFC8SS	8STF8-SS	STMC3	3STM3-B	STMP6B	ST6M6-B	VHN200B	B-VHN4-4F-B		

## DNP to BRECO Interchange

ANV-04-04C	B-6601-4-4	FF-16-16C	B-8FF8-FP	HNV-SS-16-16C	8DSF8-SS	TNV-04-04-C-M	B-VHC4-4M
ANV-04-04N	B-6602-4-4	FF-16-16N	B-FF8F8-FP	HNV-SS-16-16N	DS8F8-SS	TNV-04-04-N	B-VHN4-4F
ANV-06-06C	B-6601-6-6	HNV-04-04C	2DSF2-S	NS-04-04C	B-4050-2P	TNV-04-04-N-M	B-VHN4-4M
ANV-06-06N	B-6602-6-6	HNV-04-04N	DS2F2-S	NS-04-04N	B-4010-2P	TNV-06-06-C	B-VHC6-6F
ANV-08-08C	B-6601-8-10	HNV-06-06C	3DSF3-S	NS-06-06C	B-4050-3	TNV-06-06-C-M	B-VHC6-6M
ANV-08-08N	B-6602-8-10	HNV-06-06N	DS3F3-S	NS-06-06N	B-4010-3	TNV-06-06-N	B-VHN6-6F
ANV-08-34-ORC	B-6608-8-10	HNV-08-08C	4DSF4-S	NS-08-08C	B-4050-4	TNV-08-08-C	B-VHC8-8F
ANV-08-34-ORN	B-6610-8-10	HNV-08-08N	DS4F4-S	NS-08-08N	B-8010-4	TNV-08-08-C-M	B-VHC8-8M
ANV-08-78-ORC	B-6608-10-10	HNV-12-12C	6DSF6-S	NS-12-12C	B-4150-5	TNV-08-08-N	B-VHN8-8F
ANV-08-78-ORN	B-6610-10-10	HNV-12-12N	DS6F6-S	NS-12-12N	B-4110-5	TNV-12-12-C	B-VHC12-12F
ANV-12-116-ORC	B-6608-12-12	HNV-16-16C	8DSF8-S	NS-16-16C	B-4050-6	TNV-12-12-C-M	B-VHC12-12M
ANV-12-116-ORN	B-6610-12-12	HNV-16-16N	DS8F8-S	NS-16-16N	B-4010-6	TNV-12-12-N	B-VHN12-12F
ANV-12-12C	B-6601-12-12	HNV-B-04-04C	2DSF2-B	PVS-04-04C	B-2WM2-S	VFF-12-08C	B-6125-08
ANV-12-12N	B-6602-12-12	HNV-B-04-04N	DS2F2-B	PVS-04-04N	B-W2F2-S	VFF-12-08N	B-6105-08
ANV-16-16C	B-6601-16-16	HNV-B-06-06C	3DSF3-B	PVS-06-06C	B-3WM3-S	VFF-12-12C	B-6125-12
ANV-16-16N	B-6602-16-16	HNV-B-06-06N	DS3F3-B	PVS-06-06CF	B-3WF3-S	VFF-12-12N	B-6105-12
FF-06-06C	B-3FF3-FP	HNV-B-08-08C	4DSF4-B	PVS-06-06N	B-W3F3-S	VFF-16-16C	B-6125-16
FF-06-06N	B-FF3F3-FP	HNV-B-08-08N	DS4F4-B	PW-B-04-04C	2STF2-B	VFF-16-16N	B-6105-16
FF-06-08C	B-3FF4-FP	HNV-B-12-12C	6DSF6-B	PW-B-04-04CM	2STM2-B	VFF-20-20C	B-6125-20
FF-06-08N	B-FF3F4-FP	HNV-B-12-12N	DS6F6-B	PW-B-04-04N	ST2F2-B	VFF-20-20N	B-6105-20
FF-08-08C	B-4FF4-FP	HNV-B-16-16C	8DSF8-B	PW-B-04-04NM	ST2M2-B	VFF-24-24C	B-6125-24
FF-08-08N	B-FF4F4-FP	HNV-B-16-16N	DS8F8-B	PW-B-06-06C	3STF3-B	VFF-24-24N	B-6105-24
FF-08-12C	B-4FF6-FP	HNV-SS-04-04C	2DSF2-SS	PW-B-06-06CM	3STM3-B		
FF-08-12N	B-FF4F6-FP	HNV-SS-04-04N	DS2F2-SS	PW-B-06-06N	ST3F3-B		
FF-08-34ORC	B-4FF4-FP-SAE	HNV-SS-06-06C	3DSF3-SS	PW-B-06-06NM	ST3M3-B		
FF-08-34ORN	B-FF4F4-FP-SAE	HNV-SS-06-06N	DS3F3-SS	PW-S-04-04N	ST2F2-S		
FF-12-116ORC	B-6FF6-FP-SAE	HNV-SS-08-08C	4DSF4-SS	PW-S-04-04NM	ST2M2-S		
FF-12-116ORN	B-FF6F6-FP-SAE	HNV-SS-08-08N	DS4F4-SS	PW-S-06-06N	ST3F3-S		
FF-12-12C	B-6FF6-FP	HNV-SS-12-12C	6DSF6-SS	PW-S-06-06NM	ST3M3-S		
FF-12-12N	B-FF6F6-FP	HNV-SS-12-12N	DS6F6-SS	TNV-04-04-C	B-VHC4-4F		

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## DYNACON to BRECO Interchange

D320	B-2CF1-B	D5122	B-4CS6-S	DM461	B-3BM3-B	DM6161	B-6BM8-B	P481.A	B-B3M4-S
D321	B-2CM1-B	D560	B-4CF3-S	DM462	B-3BS3-B	DM6162	B-6BS8-B	P482.A	B-B3S4-S
D340	B-2CF2-B	D561	B-4CM3-S	DM464	B-3BPS4-B	DM680	B-6BF4-B	P5120	B-B4F6-S
D341	B-2CM2-B	D562	B-4CS3-S	DM480	B-3BF4-B	DM681	B-6BM4-B	P5122	B-B4S6-S
D342	B-2CS2-B	D580	B-4CF4-S	DM481	B-3BM4-B	DM682	B-6BS4-B	P560	B-B4F3-S
D344	B-2CPS2-B	D581	B-4CM4-S	DM482	B-3BS4-B	P320	B-B2F1-S	P561	B-B4M3-S
D352	B-2CS25-B	D582	B-4CS4-S	DM484	B-3BPS3-B	P321	B-B2M1-S	P562	B-B4S3-S
D360	B-2CF3-B	D584	B-4CPS4-S	DM5120	B-4BF6-B	P340	B-B2F2-S	P580	B-B4F4-S
D361	B-2CM3-B	DM320	B-2BF1-B	DM5121	B-4BM6-B	P341	B-B2M2-S	P581	B-B4M4-S
D362	B-2CS3-B	DM321	B-2BM1-B	DM5122	B-4BS6-B	P342	B-B2S2-S	P582	B-B4S4-S
D364	B-2CPS3-B	DM340	B-2BF2-B	DM540	B-4BF2-B	P344	B-B2PS2-S	P6120	B-B6F6-S
D440	B-3CF2-S	DM341	B-2BM2-B	DM541	B-4BM2-B	P352	B-B2S25-S	P6121	B-B6M6-S
D441	B-3CM2-S	DM342	B-2BS2-B	DM542	B-4BS2-B	P360	B-B2F3-S	P6122	B-B6S6-S
D442	B-3CS2-S	DM344	B-2BPS2-B	DM560	B-4BF3-B	P361	B-B2M3-S	P682	B-B6S4-S
D460	B-3CF3-S	DM352	B-2BS5-B	DM561	B-4BM3-B	P362	B-B2S3-S		
D461	B-3CM3-S	DM360	B-2BF3-B	DM562	B-4BS3-B	P364	B-B2PS3-S		
D462	B-3CS3-S	DM361	B-2BM3-B	DM580	B-4BF4-B	P440.A	B-B3F2-S		
D464	B-3CPS3-S	DM362	B-2BS3-B	DM581	B-4BM4-B	P441.A	B-B3M2-S		
D480	B-3CF4-S	DM364	B-2BPS3-B	DM582	B-4BS4-B	P442.A	B-B3S2-S		
D481	B-3CM4-S	DM440	B-3BF2-B	DM584	B-4BPS4-B	P460.A	B-B3F3-S		
D482	B-3CS4-S	DM441	B-3BM2-B	DM6120	B-6BF6-B	P461.A	B-B3M3-S		
D484	B-3CPS4-S	DM442	B-3BS2-B	DM6121	B-6BM6-B	P462.A	B-B3S3-S		
D5120	B-4CF6-S	DM452	B-3BS5-B	DM6122	B-6BS6-B	P464.A	B-B3PS3-S		
D5121	B-4CM6-S	DM460	B-3BF3-B	DM6160	B-6BF8-B	P480.A	B-B3F4-S		

## Faster to BRECO Interchange

2FFI-12-12-SAE-M	B-FF4F4-FP-SAE	ANV34-34-SAE-F	B-6608-12-12	HNV-18-NPT-M	DS1F1-S	NV12-12SAE-M	B-6610-8-10
2FFI-12-34-NPT-M	B-FF4F6-FP	ANV34-34-SAE-M	B-6610-12-12	HNV-34-NPT-F	6DSF6-S	NVP34-NPT-F	B-4150-5
2FFI-12-NPT-F	B-FF4F4-FP	FB-12/34-NPT-F-5	B-6125-12	HNV-34-NPT-F-2	6DSF6-SS	NVP34-NPT-M	B-4110-5
2FFI-34-34-SAE-M	B-FF6F6-FP-SAE	FB-12/34-NPT-M-5	B-6105-12	HNV-34-NPT-F-5	6DSF6-B	PVVM-14-NPT-M	B-W2F2-S
2FFI-34-NPT-M	B-FF6F6-FP	FB-16/1-NPT-F-5	B-6125-16	HNV-34-NPT-M	DS6F6-S	PVVM-38-NPT-M	B-W3F3-S
2FFI1212SAEF	B-4FF4-FP-SAE	FB-16/1-NPT-M-5	B-6105-16	HNV-34-NPT-M-1	DS6F6-SS	PVVM1/14-NPT-F	B-2WM2-S
2FFI1234NPTF	B-4FF6-FP	FB-20/114NPT-F-5	B-6125-20	HNV-34-NPT-M-5	DS6F6-B	PVVM1/38-NPT-F	B-3WM3-S
2FFI12NPTF	B-4FF4-FP	FB-20/114NPT-M-5	B-6105-20	HNV-38-NPT-F	3DSF3-S	TNV-04-NPT-F	B-VHC4-4F
2FFI3434SAEF	B-6FF6-FP-SAE	HNV-1-NPT-F	8DSF8-S	HNV-38-NPT-F-1	3DSF3-SS	TNV-04-NPT-M	B-VHN4-4F
2FFI34NPTF	B-6FF6-FP	HNV-1-NPT-F-2	8DSF8-SS	HNV-38-NPT-F-5	3DSF3-B	TNV-06-NPT-F	B-VHC6-6F
2FFN-38-12-NPT-M	B-FF3F4-FP	HNV-1-NPT-F-5	8DSF8-B	HNV-38-NPT-M	DS3F3-S	TNV-06-NPT-M	B-VHN6-6F
2FFN-38-NPT-F	B-3FF3-FP	HNV-1-NPT-M	DS8F8-S	HNV-38-NPT-M-1	DS3F3-SS	TNV-08-NPT-F	B-VHC8-8F
2FFN-38-NPT-M	B-FF3F3-FP	HNV-1-NPT-M-1	DS8F8-SS	HNV-38-NPT-M-5	DS3F3-B	TNV-08-NPT-M	B-VHN8-8F
2FFN38-12NPT-F	B-3FF4-FP	HNV-1-NPT-M-5	DS8F8-B	MV-34-NPT-F	B-4050-5	TNV-12-NPT-F	B-VHC12-12F
2MV-34-NPT-M	B-8010-5	HNV-12-NPT-F	4DSF4-S	NS-12-NPT-F	B-4050-4	TNV-12-NPT-F-5	B-VHC12-12F-B
2NS-12-NPT-M	B-8010-4	HNV-12-NPT-F-2	4DSF4-SS	NS-38-NPT-F	B-4050-3	TNV-12-NPT-M	B-VHN12-12F
2NV-12-NPT-M	B-8010-4P	HNV-12-NPT-F-5	4DSF4-B	NS-38-NPT-M	B-4010-3	TNV-12-NPT-M-5	B-VHN12-12F-B
2NV12-12SAE-M	B-8010-15	HNV-12-NPT-M	DS4F4-S	NV-1-NPT-F	B-4050-6		
2NV12-58SAE-M	B-8010-16	HNV-12-NPT-M-1	DS4F4-SS	NV-1-NPT-M	B-4010-6		
ANV-1-NPT-F	B-6601-16-16	HNV-12-NPT-M-5	DS4F4-B	NV-12-12SAE-F	B-4050-15		
ANV-1-NPT-M	B-6602-16-16	HNV-14-NPT-F	2DSF2-S	NV-12-58SAE-F	B-4050-16		
ANV-14-NPT-F	B-6601-4-4	HNV-14-NPT-F-1	2DSF2-SS	NV-12-NPT-F	B-4050-4P		
ANV-14-NPT-M	B-6602-4-4	HNV-14-NPT-F-5	2DSF2-B	NV-12-NPT-F	B-6601-8-10		
ANV-34-NPT-F	B-6601-12-12	HNV-14-NPT-M	DS2F2-S	NV-12-NPT-M	B-6602-8-10		
ANV-34-NPT-M	B-6602-12-12	HNV-14-NPT-M-1	DS2F2-SS	NV-14-NPT-F	B-4050-2P		
ANV-38-NPT-F	B-6601-6-6	HNV-14-NPT-M-5	DS2F2-B	NV-14-NPT-M	B-4010-2P		
ANV-38-NPT-M	B-6602-6-6	HNV-18-NPT-F	1DSF1-S	NV12-12SAE-F	B-6608-8-10		

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## Foster to BRECO Interchange [Page 1 of 2]

10-3	B-B2M2-S	25FS	2STF2-B	4504	B-3CM4-S	68-6	B-B6M8-S	BL3603	D342BL
10-3B	B-B2M2-B	25FSS	2STF2-SS	4504	D481	69-6	B-B6F8-S	BL3653	D352BL
10-3G	P341G	25MP	ST2M2-S	46-4	B-B3S2-S	70-6	B-B6S4-S	BL3703	D362BL
10-3S/S	B-B2M2-SS	25MPB	ST2M2-B	4604	D442	71-3	B-B2PS3-S	BL4004	D440BL
100FP	ST8F8-S	25MPS	ST2M2-SS	4704	D452	71-4	B-B3PS3-S	BL4015	D540BL
100FPB	ST8F8-B	25MS	2STM2-B	48-4	B-B3S3-S	71-5	B-B4PS3-S	BL4104	D441BL
100FPS	ST8F8-SS	2803	B-2CF1-B	4804	B-3CS3-S	71-6	B-B6S6-S	BL4204	D460BL
100FS	8STF8-B	2803	D320	4804	D462	72-6	B-B6S8-S	BL4304	D461BL
100FSS	8STF8-SS	2903	B-2CM1-B	49-4	B-B3S4-S	75FP	ST6F6-S	BL4404	D480BL
100MP	ST8M8-S	2903	D321	4904	B-3CS4-S	75FPB	ST6F6-B	BL4504	D481BL
100MPB	ST8M8-B	3003	B-2CF2-B	4904	D482	75FPS	ST6F6-SS	BL4604	D442BL
100MPS	ST8M8-SS	3003	D340	4905	D541	75FS	6STF6-B	BL4704	D452BL
100MS	8STM8-B	3003S/S	B-2CF2-SS	50-5	B-B4M2-S	75FSS	6STF6-SS	BL4804	D462BL
11-3	B-B2F2-S	310-42	B-O3M3-S	5005	B-4CF3-S	75MP	ST6M6-S	BL4904	D482BL
11-3B	B-B2F2-B	310-4204	B-3OF3-S	5005	D560	75MPB	ST6M6-B	BL4905	D541BL
11-3S/S	B-B2F2-SS	310-4204	B-3oF3-B	50FP	ST4F4-S	75MPS	ST6M6-SS	BL5005	D560BL
12-3	B-B2M1-S	310-43	B-O3F3-S	50FPB	ST4F4-B	75MS	6STM6-B	BL5105	D561BL
12FPB	ST1F1-B	310-4304	B-3OM3-S	50FPS	ST4F4-SS	81-4	B-B3PS4-S	BL5205	D580BL
12FPS	ST1F1-SS	3103	B-2CM2-B	50FS	4STF4-B	81-5	B-B4PS4-S	BL5305	D581BL
12FS	1STF1-S	3103	D341	50FSS	4STF4-SS	A04DC	B-6657-4	BL5405	D5120BL
12FSS	1STF1-SS	3103S/S	B-2CM2-SS	50MP	ST4M4-S	A04DP	B-6659-4	BL5505	D5121BL
12MP	ST1M1-S	3203	B-2CF3-B	50MPB	ST4M4-B	A06DC	B-6657-6	BL5605	D542BL
12MPB	ST1M1-B	3203	D360	50MPS	ST4M4-SS	A06DP	B-6659-6	BL5705	D562BL
12MPS	ST1M1-SS	3303	B-2CM3-B	50MS	4STM4-B	A08DC	B-6657-10	BL5805	D582BL
12MS	1STM1-B	3303	D361	51-3	B-B2PS2-S	A08DP	B-6659-10	BL5905	D5122BL
13-3	B-B2F1-S	3603	B-2CS2-B	51-4	B-B3PS2-S	A12DC	B-6657-12	FFP06-06F	B-FF3F3-FP
14-3	B-B2M3-S	3603	D342	5105	B-4CM3-S	A12DP	B-6659-12	FFP06-08F	B-FF3F4-FP
14-3GB	P361G	3653	B-2CS25-B	5105	D561	A16DC	B-6657-16	FFS06-06	B-3FF3-FP
15-3	B-B2F3-S	3653	D352	52-5	B-B4M3-S	A16DP	B-6659-16	FFS06-08	B-3FF4-FP
1513	B-2CPS2-B	3703	B-2CS3-B	5205	B-4CF4-S	AF15-04	B-6601-4-4	FH22F	B-PHN4-4F
1513	D344	3703	D362	5205	D580	AF15-06	B-6601-6-6	FH22FB	B-PHN4-4F-B
16-3	B-B2S2-S	38FP	ST3F3-S	5205	B-4CF4-B	AF15-08	B-6601-8-10	FH22M	B-PHN4-4M
165-3	B-B2S25-S	38FPB	ST3F3-B	53-5	B-B4F3-S	AF15-12	B-6601-12-12	FH22MB	B-PHN4-4M-B
17-3	B-B2S3-S	38FPS	ST3F3-SS	5305	B-4CM4-S	AF15-16	B-6601-16-16	FH33F	B-PHN6-6F
1713	B-2CPS3-B	38FS	3STF3-B	5305	D581	AM15-04	B-6602-4-4	FH33FB	B-PHN6-6F-B
1713	D364	38FSS	3STF3-SS	5305	B-4CM4-B	AM15-06	B-6602-6-6	FH33M	B-PHN6-6M
1714	B-3CPS3-S	38MP	ST3M3-S	54-5	B-B4M4-S	AM15-08	B-6602-8-10	FH33MB	B-PHN6-6M-B
1714	D464	38MPB	ST3M3-B	54-5B	B-B4M4-B	AM15-12	B-6602-12-12	FH44F	B-PHN8-8F
1814	D484	38MPS	ST3M3-SS	54-5G	P581G	AM15-16	B-6602-16-16	FH44FB	B-PHN8-8F-B
1815	B-4CPS4-S	38MS	3STM3-B	5405	B-4CF6-S	B2DC-DP	BH2-66M	FH44M	B-PHN8-8M
1815	D584	40-4	B-B3M2-S	5405	D5120	B2DC-DP	BH2-65M	FH44MB	B-PHN8-8M-B
210-10	B-O2M2-S	4004	B-3CF2-S	55-5	B-B4F4-S	B3DC-DP	BH3-66M	FHP2F2	B-VHN4-4F
210-11	B-O2F2-S	4004	D440	5505	B-4CM6-S	B3DC-DP	BH3-65M	FHP2F2B	B-VHN4-4F-B
210-12	B-O2M1-S	4015	D540	5505	D5121	B4DC-DP	BH4-66M	FHP2M2	B-VHN4-4M
210-1513	B-2OPS2-B	41-4	B-B3F2-S	56-5	B-B4M6-S	B4DC-DP	BH4-65M	FHP2M2B	B-VHN4-4M-B
210-16	B-O2S2-S	4104	B-3CM2-S	5605	D542	B6DC-DP	BH6-66M	FHP3F3	B-VHN6-6F
210-17	B-O2S3-S	4104	D441	57-5	B-B4F6-S	B6DC-DP	BH6-65M	FHP3F3B	B-VHN6-6F-B
210-1713	B-2OPS3-B	42-4	B-B3M3-S	5705	B-4CS3-S	B8DC-DP	BH8-66M	FHP3M3	B-VHN6-6M
210-3003	B-2OF2-B	42-4B	B-B3M3-B	5705	D562	B8DC-DP	BH8-65M	FHP3M3B	B-VHN6-6M-B
210-3003	B-2OF2-S	4204	B-3CF3-S	5805	B-4CS4-S	BL1513	D344BL	FHP4F4	B-VHN8-8F
210-3103	B-2OM2-B	4204	D460	5805	D582	BL1713	D364BL	FHP4F4B	B-VHN8-8F-B
210-3103	B-2OM2-S	4204	B-3CF3-B	59-5	B-B4S3-S	BL1714	D464BL	FHP4M4	B-VHN8-8M
210-3203	B-2OF3-B	43-4	B-B3F3-S	5905	B-4CS6-S	BL1814	D484BL	FHP4M4B	B-VHN8-8M-B
210-3303	B-2OM3-B	4304	B-3CM3-S	5905	D5122	BL1815	D584BL	FHS2	B-PHC4-4F
210-3603	B-2OS2-B	4304	D461	60-5	B-B4S4-S	BL2803	D320BL	FHS2B	B-PHC4-4F-B
210-3703	B-2OS3-B	4304	B-3CM3-B	61-5	B-B4S6-S	BL2903	D321BL	FHS2F2	B-VHC4-4F
210-51	B-O2PS2-S	44-4	B-B3M4-S	64-6	B-B6M4-S	BL3003	D340BL	FHS2F2B	B-VHC4-4F-B
25FP	ST2F2-S	4404	B-3CF4-S	65-6	B-B6F4-S	BL3103	D341BL	FHS2M2	B-VHC4-4M
25FPB	ST2F2-B	4404	D480	66-6	B-B6M6-S	BL3203	D360BL	FHS2M2B	B-VHC4-4M-B
25FPS	ST2F2-SS	45-4	B-B3F4-S	67-6	B-B6F6-S	BL3303	D361BL	FHS3	B-PHC6-6F

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## Foster to BRECO Interchange [PAGE 2 OF 2]

FHS3B	B-PHC6-6F-B	FMSD9-3	B-2BK3-B	FS316VP	B-PC316V-BP	K6B	DS6F6-B	SL4704	B-3bS5-B-SL
FHS3F3	B-VHC6-6F	FMSD9-4	B-3BK3-B	FS318	B-PC318	K6S	DS6F6-S	SL4804	B-3BS3-B-SL
FHS3F3B	B-VHC6-6F-B	FP251	B-PN251	FS318P	B-PC318-BP	K6SS	DS6F6-SS	SL4904	B-3BS4-B-SL
FHS3M3	B-VHC6-6M	FP251F	B-PN251F	FS318V	B-PC318V	K8B	DS8F8-B	SL4905	B-4BM2-B-SL
FHS3M3B	B-VHC6-6M-B	FP251FB	B-BPN251F	FS318VP	B-PC318V-BP	K8S	DS8F8-S	SL5005	B-4BF3-B-SL
FHS4	B-PHC8-8F	FP252	B-PN252	FS326	B-PC326	K8SS	DS8F8-SS	SL5105	B-4BM3-B-SL
FHS4B	B-PHC8-8F-B	FP252F	B-PN252F	FS326P	B-PC326-BP	LN10	B-L2M2-S	SL5205	B-4BF4-B-SL
FHS4F4	B-VHC8-8F	FP252FB	B-BPN252F	FS326V	B-PC326V	LN11	B-L2F2-S	SL5305	B-4BM4-B-SL
FHS4F4B	B-VHC8-8F-B	FP253	B-PN253	FS326VP	B-PC326V-BP	LN3003	B-2LF2-B	SL5405	B-4BF6-B-SL
FHS4M4	B-VHC8-8M	FP253F	B-PN253F	FS328	B-PC328	LN3103	B-2LM2-B	SL5505	B-4BM6-B-SL
FHS4M4B	B-VHC8-8M-B	FP352	B-PN352	FS328P	B-PC328-BP	PB3-3	B-B2E2-S	SL5605	B-4BS2-B-SL
FM1513	B-2BPS2-B	FP352F	B-PN352F	FS328V	B-PC328V	PB5-3	B-B2H2-S	SL5705	B-4BS3-B-SL
FM1713	B-2BPS3-B	FP352FB	B-BPN352F	FS328VP	B-PC328V-BP	PB7-3	B-B2H3-S	SL5805	B-4BS4-B-SL
FM1714	B-3BPS3-B	FP353	B-PN353	FS504	B-PC504	PD9-3	B-B2K3-S	SL5905	B-4BS6-B-SL
FM1814	B-3BPS4-B	FP353F	B-PN353F	FS504P	B-PC504-BP	SB3-3	B-2CE2-B	SL6206	B-6BF4-B-SL
FM1815	B-4BPS4-B	FP353FB	B-BPN353F	FS506	B-PC506	SB5-3	B-2CG2-B	SL6306	B-6BM4-B-SL
FM2803	B-2BF1-B	FP354	B-PN354	FWNP10	B-6105-20	SB7-3	B-2CH2-B	SL6406	B-6BF6-B-SL
FM2903	B-2BM1-B	FP554	B-PN554	FWNP6	B-6105-12	SD7-3	B-2CH3-B	SL6506	B-6BM6-B-SL
FM3003	B-2BF2-B	FP556	B-PN556	FWNP8	B-6105-16	SD9-3	B-2CK3-B	SL6606	B-6BF8-B-SL
FM3103	B-2BM2-B	FS204	B-PC204	FWNS10	B-6125-20	SHD10	B-TL2M2-S	SL6706	B-6BM8-B-SL
FM3203	B-2BF3-B	FS204P	B-PC204-BP	FWNS6	B-6125-12	SHD11	B-TL2F2-S	SL6806	B-6BS4-B-SL
FM3303	B-2BM3-B	FS204V	B-PC204AV	FWNS8	B-6125-16	SHD12	B-TL2M1-S	SL6906	B-6BS6-B-SL
FM3603	B-2BS2-B	FS204VP	B-PC204AV-BP	H1B	1DSF1-B	SHD13	B-TL2F1-S	SL7006	B-6BS8-B-SL
FM3653	B-2BS5-B	FS205	B-PC205	H1DP	BH1-65	SHD16	B-TL2S2-S	SLSB7-3	B-2BH2-B-SL
FM3703	B-2BS3-B	FS205V	B-PC205AV	H1S	1DSF1-S	SHD2803	B-2TLF1-S	SLSD7-4	B-3BH3-B-SL
FM4004	B-3BF2-B	FS206	B-PC206	H1SS	1DSF1-SS	SHD3003	B-2TLF2-S	SLSD9-4	B-3BK3-B-SL
FM4015	B-4BF2-B	FS206P	B-PC206-BP	H2B	2DSF2-B	SHD3103	B-2TLM2-S	TF10	B-J2M2-S
FM4104	B-3BM2-B	FS206V	B-PC206AV	H2B-103	2DSF2-BI	SHD3203	B-2TLF3-S	TF11	B-J2F2-S
FM4204	B-3BF3-B	FS206VP	B-PC206AV-BP	H2DP	BH2-65	SHD3303	B-2TLM3-S	TF12	B-J2M1-S
FM4304	B-3BM3-B	FS214	B-PC214	H2S	2DSF2-S	SHD50	B-TL4M2-S	TF13	B-J2F1-S
FM4404	B-3BF4-B	FS214P	B-PC214-BP*	H2SS	2DSF2-SS	SHD5005	B-4TLF3-S	TF14	B-J2M3-S
FM4504	B-3BM4-B	FS214V	B-PC214AV	H3B	3DSF3-B	SHD5105	B-4TLM3-S	TF15	B-J2F3-S
FM4604	B-3BS2-B	FS214VP	B-PC214AV-BP	H3DP	BH3-65	SHD52	B-TL4M3-S	TF1513	B-2JPS2-B
FM4704	B-3bS5-B	FS215	B-PC215	H3S	3DSF3-S	SHD5205	B-4TLF4-S	TF16	B-J2S2-S
FM4804	B-3BS3-B	FS215V	B-PC215AV	H3SS	3DSF3-SS	SHD53	B-TL4F3-S	TF17	B-J2S3-S
FM4904	B-3BS4-B	FS216P	B-PC216-BP	H4B	4DSF4-B	SHD5305	B-4TLM4-S	TF1713	B-2JPS3-B
FM4905	B-4BM2-B	FS216V	B-PC216AV	H4DP	BH4-65	SHD54	B-TL4M4-S	TF1714	B-3JPS3-S
FM5005	B-4BF3-B	FS216VP	B-PC216AV-BP	H4S	4DSF4-S	SHD5405	B-4TLF6-S	TF2803	B-2JF1-B
FM5105	B-4BM3-B	FS224	B-PC224	H4SS	4DSF4-SS	SL1513	B-2BPS2-B-SL	TF3003	B-2JF2-B
FM5205	B-4BF4-B	FS224P	B-PC224-BP*	H6B	6DSF6-B	SL1713	B-2BPS3-B-SL	TF3103	B-2JM2-B
FM5305	B-4BM4-B	FS224V	B-PC224AV	H6DP	BH6-65	SL1714	B-3BPS3-B-SL	TF3203	B-2JF3-B
FM5405	B-4BF6-B	FS224VP	B-PC224AV-BP	H6S	6DSF6-S	SL1814	B-3BPS4-B-SL	TF3303	B-2JM3-B
FM5505	B-4BM6-B	FS225	B-PC225	H6SS	6DSF6-SS	SL1815	B-4BPS4-B-SL	TF3603	B-2JS2-B
FM5605	B-4BS2-B	FS225V	B-PC225AV	H8B	8DSF8-B	SL2803	B-2BF1-B-SL	TF3703	B-2JS3-B
FM5705	B-4BS3-B	FS226	B-PC226	H8DP	BH8-65	SL2903	B-2BM1-B-SL	TF40	B-J3M2-S
FM5805	B-4BS4-B	FS226P	B-PC226-BP	H8S	8DSF8-S	SL3003	B-2BF2-B-SL	TF4004	B-3JF2-S
FM5905	B-4BS6-B	FS226V	B-PC226AV	H8SS	8DSF8-SS	SL3103	B-2BM2-B-SL	TF41	B-3JF2-S
FM6206	B-6BF4-B	FS226VP	B-PC226AV-BP	K1B	DS1F1-B	SL3203	B-2BF3-B-SL	TF4104	B-3JM2-S
FM6306	B-6BM4-B	FS261	B-PC216	K1S	DS1F1-S	SL3303	B-2BM3-B-SL	TF42	B-3JM3-S
FM6406	B-6BF6-B	FS306	B-PC306	K1SS	DS1F1-SS	SL3603	B-2BS2-B-SL	TF4204	B-3JF3-S
FM6506	B-6BM6-B	FS306P	B-PC306-BP	K2B	DS2F2-B	SL3653	B-2BS5-B-SL	TF43	B-3JF3-S
FM6606	B-6BF8-B	FS306V	B-PC306V	K2B-103	DS2F2-BI	SL3703	B-2BS3-B-SL	TF4304	B-3JM3-S
FM6706	B-6BM8-B	FS306VP	B-PC306V-BP	K2S	DS2F2-S	SL4004	B-3BF2-B-SL	TF4404	B-3JF4-S
FM6806	B-6BS4-B	FS306VP	B-PC308V-BP	K2SS	DS2F2-SS	SL4015	B-4BF2-B-SL	TF4504	B-3JM4-S
FM6906	B-6BS6-B	FS308	B-PC308	K3B	DS3F3-B	SL4104	B-3BM2-B-SL	TF48	B-J3S3-S
FM7006	B-6BS8-B	FS308P	B-PC308-BP	K3S	DS3F3-S	SL4204	B-3BF3-B-SL	TF4804	B-3JS3-S
FMSB3-3	B-2BE2-B	FS308V	B-PC308V	K3SS	PC3F3-SS	SL4304	B-3BM3-B-SL	TF4904	B-3JS4-S
FMSB5-3	B-2BG2-B	FS316	B-PC316	K4B	DS4F4-B	SL4404	B-3BF4-B-SL	TF51	B-J2PS2-S
FMSB7-3	B-2BH2-B	FS316P	B-PC316-BP	K4S	DS4F4-S	SL4504	B-3BM4-B-SL	TF71	B-J2PS3-S
FMSD7-4	B-3BH3-B	FS316V	B-PC316V	K4SS	DS4F4-SS	SL4604	B-3BS2-B-SL		

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## Hansen to BRECO Interchange [Page 1 of 2]

1-S10	1STM1-B	21AP-25M	B-J2M2-S	4000	B-3BF2-B	50SVS-50M	SV5305
1-S11	1STF1-B	21AP-37H	B-J2S3-S	4000SL	B-3BF2-B-SL	5100	B-4CM3-S
1-SB3	B-2CE2-B	22238	B-O2S3-S	4004	D442	5100	D561
1-SB5	B-2CG2-B	25FFP100	B-FF8F8-FP	4006	B-3CS3-S	5100	B-4BM3-B
1-SB7	B-2CH2-B	25FFS100	B-8FF8-FP	4006	D462	5100SL	B-4BM3-B-SL
1-SD7	B-2CH3-B	2607	B-O2M1-S	4008	B-3CS4-S	52	B-4BM3-S
1-SD9	B-2CK3-B	2608	B-O2M2-S	4008	D482	520	B-4CF4-S
1-T10	ST1M1-S	2609	B-O2F2-S	404	B-B3S2-S	520	D580
1-T11	ST1F1-S	2800	B-2BF1-B	40400	B-3BS2-B	5200	B-4BF4-B
10	B-B2M2-S	2800SL	B-2BF1-B-SL	40400SL	B-3BS2-B-SL	5200SL	B-4BF4-B-SL
1000	B-2CF2-B	2900	B-2BM1-B	4050	D452	53	B-B4F3-S
1000	D340	2900-SL	B-2BM1-B-SL	40500	B-3bS5-B	53-A	B-B4F2-S
10C	P341G	2H16	2DSF2-S	40500SL	B-3bS5-B-SL	530	B-4CM4-S
10FFP37	B-FF3F3-FP	2K16	DS2F2-S	406	B-B3S3-S	530	D581
10FFP50	B-FF3F4-FP	3-PB3	B-B2E2-S	40600	B-3BS3-B	5300	B-4BM4-B
10FFS37	B-3FF3-FP	3-PB5	B-B2H2-S	40600SL	B-3BS3-B-SL	5300SL	B-4BM4-B-SL
10FFS50	B-3FF4-FP	3-PD7	B-B2H3-S	408	B-B3S4-S	54	B-B4M4-S
11	B-B2F2-S	3-PD9	B-B2K3-S	40800	B-3BS4-B	540	B-4CF6-S
11-B	B-B2F2-B	3-S20	3STM3-B	40800SL	B-3BS4-B-SL	540	D5120
1100	B-2CM2-B	3-S21	3STF3-B	40SVS-37F	SV4204	5400	B-4BF6-B
1100	D341	3-SB3	B-2BE2-B	40SVS-37H	SV4804	5400SL	B-4BF6-B-SL
12	B-B2M1-S	3-SB7	B-2BH2-B	40SVS-37M	SV4304	55	B-B4F4-S
1200	B-2CF3-B	3-SB7SL	B-2BH2-B-SL	41	B-B3F2-S	550	B-4CM6-S
1200	D360	3-SD9	B-2BK3-B	410	B-3CM2-S	550	D5121
12FFP50	B-FF4F4-FP	3-SD9-SL	B-2BK3-B-SL	410	D441	5500	B-4BM6-B
12FFP75	B-FF4F6-FP	3-T20	ST3M3-S	4100	B-3BM2-B	5500SL	B-4BM6-B-SL
12FFP75UN	B-FF4F4-FP-SAE	3-T21	ST3F3-S	4100SL	B-3BM2-B-SL	56	B-B4M6-S
12FFS50	B-4FF4-FP	3000	B-2BF2-B	42	B-B3M3-S	57	B-B4F6-S
12FFS75	B-4FF6-FP	3000SL	B-2BF2-B-SL	420	B-3CF3-S	570	B-4CS3-S
12FFS75UN	B-4FF4-FP-SAE	30SVS-25F	SV3003	420	D460	570	D562
13	B-B2F1-S	30SVS-25M	SV3103	4200	B-3BF3-B	5700	B-4BS3-B
1300	B-2CM3-B	310	B-3OF3-S	4200SL	B-3BF3-B-SL	5700SL	B-4BS3-B-SL
1300	D361	310-313	B-3OM3-S	43	B-B3F3-S	580	B-4CS4-S
14	B-B2M3-S	3100	B-2BM2-B	430	B-3CM3-S	580	D582
15	B-B2F3-S	3100-SL	B-2BM2-B-SL	430	D461	5800	B-4BS4-B
16	B-B2S2-S	3200	B-2BF3-B	4300	B-3BM3-B	5800SL	B-4BS4-B-SL
1600	B-2CS2-B	3200SL	B-2BF3-B-SL	4300SL	B-3BM3-B-SL	59	B-B4S3-S
1600	D342	3300	B-2BM3-B	44	B-B3M4-S	590	B-4CS6-S
1600P	B-2CPS2-B	3300-SL	B-2BM3-B-SL	440	B-3CF4-S	590	D5122
1600P	D344	3600	B-2BS2-B	440	D480	5900	B-4BS6-B
16P	B-B2PS2-S	3600-SL	B-2BS2-B-SL	4400	B-3BF4-B	5900SL	B-4BS6-B-SL
17	B-B2S3-S	3600P	B-2BPS2-B	4400SL	B-3BF4-B-SL	6-S30	6STM6-B
1700	B-2CS3-B	3700	B-2BS3-B	45	B-B3F4-S	6-S31	6STF6-B
1700	D362	3700-SL	B-2BS3-B-SL	450	B-3CM4-S	6-T30	6T6M6-S
1700P	B-2CPS3-B	3700P	B-2BPS3-B	450	D481	6-T31	6T6F6-S
1700P	D364	3800	B-2BS5-B	4500	B-3BM4-B	60	B-B4S4-S
17P	B-B2PS3-S	3800SL	B-2BS5-B-SL	4500SL	B-3BM4-B-SL	60SVS-75F	SV6406
18	B-B2S25-S	3804	B-O3M3-S	4HP26	4DSF4-S	60SVS-75M	SV6506
1800	B-2CS25-B	3806	B-O3F3-S	4KP26	DS4F4-S	61	B-B4S6-S
1800	D352	3946	B-O2S2-S	50	B-B4M2-S	6200	B-6BF4-B
19FFP106UN	B-FF6F6-FP-SAE	3H21	3DSF3-S	5000	B-4CF3-S	6200SL	B-6BF4-B-SL
19FFP75	B-FF6F6-FP	3K21	DS3F3-S	5000	D560	6300	B-6BM4-B
19FFS106UN	B-6FF6-FP-SAE	4-S25	4STM4-B	5000	B-4BF3-B	6300SL	B-6BM4-B-SL
19FFS75	B-6FF6-FP	4-S26	4STF4-B	5000A	B-4BF2-B	6400	B-6BF6-B
1H11	1DSF1-S	4-SD7	B-3BH3-B	5000SL	B-4BF3-B-SL	6400SL	B-6BF6-B-SL
1K11	DS1F1-S	4-SD7SL	B-3BH3-B-SL	500A	D540	64A	B-B6M4-S
2-S15	2STM2-B	4-SD9	B-3BK3-B	501	D541	6500	B-6BM6-B
2-S16	2STF2-B	4-SD9SL	B-3BK3-B-SL	50100	B-4BM2-B	6500SL	B-6BM6-B-SL
2-T15	ST2M2-S	4-T25	ST4M4-S	50100SL	B-4BM2-B-SL	65A	B-B6F4-S
2-T16	ST2F2-S	4-T26	ST4F4-S	50400	B-4BS2-B	6600	B-6BF8-B
210	B-2OF2-S	40	B-B3M2-S	50400SL	B-4BS2-B-SL	6600SL	B-6BF8-B-SL
210-212	B-2OM2-S	400	B-3CF2-S	50SVS-50F	SV5205	66A	B-B6M6-S
21AP-25H	B-J2S2-S	400	D440	50SVS-50H	SV5805	6700	B-6BM8-B

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## Hansen to BRECO Interchange [PAGE 2 OF 2]

6700SL	B-6BM8-B-SL	B54	B-B4M4-B	FTS-308	B-PC308	LL3-S21	3STF3-SS
67A	B-B6F6-S	B6-T30	ST6M6-B	FTS-308HP	B-PC308-BP	LL3-T20	ST3M3-SS
6800	B-6BS4-B	B6-T31	ST6F6-B	FTS-308V	B-PC308V	LL3-T21	ST3F3-SS
6800SL	B-6BS4-B-SL	B66A	B-B6M6-B	FTS-308VHP	B-PC308V-BP	LL3H21	3DSF3-SS
68A	B-B6M8-S	B6HP31	6DSF6-B	FTS-316	B-PC316	LL3K21	DS3F3-SS
6900	B-6BS6-B	B6KP31	DS6F6-B	FTS-316HP	B-PC316-BP	LL4-S25	4STM4-SS
6900SL	B-6BS6-B-SL	B8-T35	ST8M8-B	FTS-316V	B-PC316V	LL4-S26	4STF4-SS
69A	B-B6F8-S	B8-T36	ST8F8-B	FTS-316VHP	B-PC316V-BP	LL4-T25	ST4M4-SS
6HP31	6DSF6-S	B8HP36	8DSF8-B	FTS-318	B-PC318	LL4-T26	ST4F4-SS
6KP31	DS6F6-S	B8KP36	DS8F8-B	FTS-318HP	B-PC318-BP	LL4HP26	4DSF4-SS
7000	B-6BS8-B	FL96-075	B-6107-08	FTS-318V	B-PC318V	LL4KP26	DS4F4-SS
7000SL	B-6BS8-B-SL	FL96-100	B-6107-16	FTS-318VHP	B-PC318V-BP	LL6-S30	6STM6-SS
70A	B-B6S4-S	FL96-125	B-6107-20	FTS-326	B-PC326	LL6-S31	6STF6-SS
71A	B-B6S6-S	FPT-205V	B-PC205AV	FTS-326HP	B-PC326-BP	LL6-T30	ST6M6-SS
72A	B-B6S8-S	FPT-206	B-PC206	FTS-326V	B-PC326V	LL6-T31	ST6F6-SS
8-S35	8STM8-B	FPT-206HP	B-PC206-BP	FTS-326VHP	B-PC326V-BP	LL6HP31	6DSF6-SS
8-S36	8STF8-B	FPT-252	B-PN252	FTS-328	B-PC328	LL6KP31	DS6F6-SS
8-T35	ST8M8-S	FPT-253	B-PN253	FTS-328HP	B-PC328-BP	LL8-S36	8STF8-SS
8-T36	ST8F8-S	FPT-352	B-PN352	FTS-328V	B-PC328V	LL8-T35	ST8M8-SS
800	B-2CF1-B	FPT-353	B-PN353	FTS-328VHP	B-PC328V-BP	LL8-T36	ST8F8-SS
800	D320	FPT-354	B-PN354	FTS-504	B-PC504	LL8HP36	8DSF8-SS
8HP36	8DSF8-S	FPT-554	B-PN554	FTS-504HP	B-PC504-BP	LL8KP36	DS8F8-SS
8KP36	DS8F8-S	FPT-556	B-PN556	FTS-506	B-PC506	P-PDC-1-HK	BH1-66M
900	B-2CM1-B	FTP-204VHP	B-PC204AV-BP	HA1521100	B-6601-4-4	P-PDC-2-HK	BH2-66M
900	D321	FTP-214VHP	B-PC214AV-BP	HA1521200	B-6602-4-4	P-PDC-3-HK	BH3-66M
96-P36	B-6105-16	FTP-224VHP	B-PC224AV-BP	HA1522100	B-6601-6-6	P-PDC-4-HK	BH4-66M
96-P41	B-6105-20	FTP-251	B-PN251	HA1522200	B-6602-6-6	P-PDC-6-HK	BH6-66M
96-S31	B-6125-12	FTP-251-F	B-PN251F	HA1523100	B-6601-8-10	P-PDC-8-HK	BH8-66M
96-S36	B-6125-16	FTP-252-F	B-PN252F	HA1523200	B-6602-8-10	P-SDC-1-HK	BH1-65M
96-S41	B-6125-20	FTP-253-F	B-PN253F	HA1524100	B-6601-12-12	P-SDC-2-HK	BH2-65M
96P31	B-6105-12	FTP-352-F	B-PN352F	HA1524200	B-6602-12-12	P-SDC-3-HK	BH3-65M
B1-T10	ST1M1-B	FTP-353-F	B-PN353F	HA1525100	B-6601-16-16	P-SDC-4-HK	BH4-65M
B1-T11	ST1F1-B	FTS-204	B-PC204	HA1525200	B-6602-16-16	P-SDC-6-HK	BH6-65M
B10	B-B2M2-B	FTS-204HP	B-PC204-BP	HP1511100	B-6659-4	P-SDC-8-HK	BH8-65M
B1H11	1DSF1-B	FTS-204V	B-PC204AV	HP1511200	B-6657-4	PDC-1-HK	BH1-66
B1K11	DS1F1-B	FTS-205	B-PC205	HP1512100	B-6659-6	PDC-2-HK	BH2-66
B2-T15	ST2M2-B	FTS-206V	B-PC206AV	HP1512200	B-6657-6	PDC-3-HK	BH3-66
B2-T16	ST2F2-B	FTS-206VHP	B-PC206AV-BP	HP1513100	B-6659-10	PDC-4-HK	BH4-66
B23AS-25F	B-2UF2-B	FTS-214	B-PC214	HP1513200	B-6657-10	PDC-6-HK	BH6-66
B23AS-25F	DW340A	FTS-214HP	B-PC214-BP*	HP1514100	B-6659-12	PDC-8-HK	BH8-66
B23AS-25H	DW342A	FTS-214V	B-PC214AV	HP1514200	B-6657-12	PDC-96-075	B-6108-08
B23AS-25M	B-2UM2-B	FTS-215	B-PC215	HP1515100	B-6659-16	PDC-96-100	B-6108-16
B23AS-25M	DW341A	FTS-215V	B-PC215AV	HP1515200	B-6657-16	PDC-96-125	B-6108-20
B23AS-37F	DW360A	FTS-216	B-PC216	LL-10	B-B2M2-SS	SDC-1-HK	BH1-65
B23AS-37H	DW362A	FTS-216HP	B-PC216-BP	LL-1000	B-2CF2-SS	SDC-2-HK	BH2-65
B23AS-37M	DW361A	FTS-216V	B-PC216AV	LL-11	B-B2F2-SS	SDC-3-HK	BH3-65
B2H16	2DSF2-B	FTS-216VHP	B-PC216AV-BP	LL-1100	B-2CM2-SS	SDC-4-HK	BH4-65
B2H16-192	2DSF2-BI	FTS-224	B-PC224	LL1-K11	DS1F1-SS	SDC-6-HK	BH6-65
B2K16	DS2F2-B	FTS-224HP	B-PC224-BP*	LL1-S10	1STM1-SS	SDC-8-HK	BH8-65
B2K16-192	DS2F2-BI	FTS-224V	B-PC224AV	LL1-S11	1STF1-SS	SDC-96-075	B-6109-08
B3-T20	ST3M3-B	FTS-225	B-PC225	LL1-T10	ST1M1-SS	SDC-96-100	B-6109-16
B3-T21	ST3F3-B	FTS-225V	B-PC225AV	LL1-T11	ST1F1-SS	SDC-96-125	B-6109-20
B3H21	3DSF3-B	FTS-226	B-PC226	LL1H11	1DSF1-SS	WA5611400	B-3009-2
B3K21	DS3F3-B	FTS-226HP	B-PC226-BP	LL2-S15	2STM2-SS	WA5611700	B-3005-2
B4-T25	ST4M4-B	FTS-226V	B-PC226AV	LL2-S16	2STF2-SS	WA5612400	B-3009-3
B4-T26	ST4F4-B	FTS-226VHP	B-PC226AV-BP	LL2-T15	ST2M2-SS	WA5612700	B-3005-3
B42	B-B3M3-B	FTS-306	B-PC306	LL2-T16	ST2F2-SS	WA5651400	B-W2F2-S
B43	B-B3F3-B	FTS-306HP	B-PC306-BP	LL2H16	2DSF2-SS	WA5651700	B-2WM2-S
B4HP26	4DSF4-B	FTS-306V	B-PC306V	LL2K16	DS2F2-SS	WA5652400	B-W3F3-S
B4KP26	DS4F4-B	FTS-306VHP	B-PC306V-BP	LL3-S20	3STM3-SS		

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## Milton to BRECO Interchange

1717-4	B-2CPS2-B	1786-4	B-2JPS2-B	1816	B-4CM4-S	1875	B-30F3-S	736	B-B2S2-S	786-6	B-2JS3-B
1717-4	D344	1786-6	B-2JPS3-B	1816	D581	1877	B-O3M3-S	736-6	B-B2S3-S	788	B-2JF3-B
1717-6	B-2CPS3-B	1796-6	B-3CPS3-S	1833	B-3CF2-S	1878	B-O3F3-S	745	B-2UF2-B	789	B-2JM3-B
1717-6	D364	1796-6	D464	1833	D440	715	B-2CF2-B	745	DW340A	790	B-2LF2-B
1736-4	B-B2PS2-S	1797-6	B-B3PS3-S	1834	B-3CM2-S	715	D340	746	B-2UM2-B	791	B-L2M2-S
1736-6	B-B2PS3-S	1803	B-3JF2-S	1834	D441	716	B-2CM2-B	746	DW341A	792	B-L2F2-S
1746-6	B-3JPS3-S	1804	B-3JM2-S	1835	B-3CF3-S	716	D341	775	B-2OF2-S		
1747-6	B-J3PS3-S	1805	B-3JF3-S	1835	D460	717	B-2CS2-B	776	B-2OM2-S		
1761	2STF2-B	1806	B-3JM3-S	1836	B-3CM3-S	717	D342	776-4	B-2OS2-B		
1762	2STM2-B	1806-6	B-3JS3-S	1836-6	B-3CS3-S	717-6	B-2CS3-B	776-6	B-2OS3-B		
1763	ST2M2-S	1807	B-J3M3-S	1836-6	D462	717-6	D362	777	B-O2M2-S		
1764	ST2F2-S	1807-6	B-J3S3-S	1837	B-B3M3-S	718	B-2CF3-B	777-4	B-O2S2-S		
1765	3STF3-B	1808	B-J3F3-S	1837-6	B-B3S3-S	718	D360	777-6	B-O2S3-S		
1766	3STM3-B	1809	B-J3M2-S	1838	B-B3F3-S	719	B-2CM3-B	778	B-O2F2-S		
1767	ST3M3-S	1810	B-J3F2-S	1839	B-B3M2-S	719	D361	783	B-J2M2-S		
1768	ST3F3-S	1813	B-4CF3-S	1840	B-B3F2-S	726	B-B2M1-S	783-4	B-J2S2-S		
1776-4	B-2OPS2-B	1813	D560	1855	B-B4M2-S	727	B-B2M2-S	783-6	B-J2S3-S		
1776-6	B-2OPS3-B	1814	B-4CM3-S	1857	B-B4M4-S	728	B-B2F2-S	784	B-J2F2-S		
1777-4	B-O2PS2-S	1814	D561	1858	B-B4F4-S	729	B-B2F1-S	785	B-2JF2-B		
1783-4	B-J2PS2-S	1815	B-4CF4-S	1859	B-B4M3-S	732	B-B2F3-S	786	B-2JM2-B		
1783-6	B-J2PS3-S	1815	D580	1860	B-B4F3-S	733	B-B2M3-S	786-4	B-2JS2-B		

## Parker to BRECO Interchange [Page 1 of 3]

0C	B-J2M1-S	17G	B-4CF6-S	3010-3	B-W3F3-S	5209-4M	B-5209-4M
0E	B-J3M2-S	17G	D5120	3050-2	B-2WM2-S	5209-5	B-5209-5
14	B-3JM3-S	1C	B-J2F1-S	3050-3	B-3WM3-S	5209-6	B-5209-6
14-5B	B-3JS3-S	1E	B-J3F2-S	3050-3-231	B-3WF3-S	5E	B-J3S3-S
14-5NP	B-3JPS3-S	24	B-3CM3-S	3C	B-J2F2-S	5EP	B-J3PS3-S
14-6B	B-3JS4-S	24	D461	3C-E	B-J2F3-S	6100-08	B-6100-08
14C	B-3JM2-S	24-5B	B-3CS3-S	3E	B-J3F3-S	6100-12	B-6100-12
14F	B-3JM4-S	24-5B	D462	4010-2P	B-4010-2P	6100-16	B-6100-16
15	B-3JF3-S	24-5BP	B-3CPS3-S	4010-3	B-4010-3	6100-20	B-6100-20
15C	B-3JF2-S	24-5BP	D464	4010-6	B-4010-6	6100-24	B-6100-24
15F	B-3JF4-S	24-6B	B-3CS4-S	4010-6P	B-4010-6P	6105-08	B-6105-08
16	B-4CM4-S	24-6B	D482	4050-15	B-4050-15	6105-12	B-6105-12
16	D581	24C	B-3CM2-S	4050-16	B-4050-16	6105-16	B-6105-16
16-5B	B-4CS3-S	24C	D441	4050-2P	B-4050-2P	6105-20	B-6105-20
16-5B	D562	24F	B-3CM4-S	4050-4	B-4050-4	6105-24	B-6105-24
16-5BP	B-4CPS3-S	24F	D481	4050-4P	B-4050-4P	6106-16	B-6109-16
16-6B	B-4CS4-S	25	B-3CF3-S	4050-5	B-4050-5	6107-08	B-6107-08
16-6B	D582	25	D460	4050-6P	B-4050-6	6107-16	B-6107-16
16-6BP	B-4CPS4-S	25C	B-3CF2-S	4050-6P	B-4050-6P	6107-20	B-6107-20
16-6BP	D584	25C	D440	4110-5	B-4110-5	6107-24	B-6107-24
16-7B	B-4CS6-S	25F	B-3CF4-S	4150-5	B-4150-5	6108-08	B-6108-08
16-7B	D5122	25F	D480	5205-2M	B-5205-2M	6108-16	B-6108-16
16E	B-4CM3-S	2C	B-J2M2-S	5205-3	B-5205-3	6108-20	B-6108-20
16E	D561	2C-E	B-J2M3-S	5205-4M	B-6659-10	6108-24	B-6108-24
16G	B-4CM6-S	2E	B-J3M3-S	5205-4M	B-5205-4M	6109-08	B-6109-08
16G	D5121	3005-2	B-3005-2	5205-5	B-5205-5	6109-20	B-6109-20
17	B-4CF4-S	3005-3	B-3005-3	5205-6	B-5205-6	6109-24	B-6109-24
17	D580	3009-2	B-3009-2	5209-2M	B-5209-2M	6110-08	B-6110-08
17E	B-4CF3-S	3009-3	B-3009-3	5209-3	B-5209-3	6110-12	B-6110-12
17E	D560	3010-2	B-W2F2-S	5209-4M	B-6657-10	6110-16	B-6110-16

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## Parker to BRECO Interchange [PAGE 2 OF 3]

6110-20	B-6110-20	8CP	B-J2PS2-S	B35	B-3BF3-B	BST-3	3STF3-B
6110-24	B-6110-24	9C	B-J2S3-S	B35-SL	B-3BF3-B-SL	BST-3M	3STM3-B
6115-08	B-6115-08	9CP	B-J2PS3-S	B35C	B-3BF2-B	BST-4	4STF4-B
6115-12	B-6115-12	A2C	B-O2M2-S	B35F	B-3BF4-B	BST-4M	4STM4-B
6115-16	B-6115-16	A3C	B-O2F2-S	B36	B-4BM4-B	BST-6	6STF6-B
6115-20	B-6115-20	A8C	B-O2S2-S	B36-6B	B-4BS4-B	BST-6M	6STM6-B
6115-24	B-6115-24	A8CP	B-O2PS2-S	B36-6BP	B-4BPS4-B	BST-8	8STF8-B
6120-08	B-6120-08	B10-3B	B-2JS2-B	B36-7B	B-4BS6-B	BST-8M	8STM8-B
6120-12	B-6120-12	B10-3BP	B-2JPS2-B	B36E	B-4BM3-B	BST-N1	ST1F1-B
6120-16	B-6120-16	B10-5B	B-2JS3-B	B36G	B-4BM6-B	BST-N1M	ST1M1-B
6120-20	B-6120-20	B10-5BP	B-2JPS3-B	B37	B-4BF4-B	BST-N2	ST2F2-B
6120-24	B-6120-24	B12	B-2JM2-B	B37-SL	B-4BF4-B-SL	BST-N2M	ST2M2-B
6125-08	B-6125-08	B12E	B-2JM3-B	B37E	B-4BF3-B	BST-N3	ST3F3-B
6125-12	B-6125-12	B13	B-2JF2-B	B37G	B-4BF6-B	BST-N3M	ST3M3-B
6125-16	B-6125-16	B13A	B-2JF1-B	B38	B-6BM6-B	BST-N4	ST4F4-B
6125-20	B-6125-20	B13E	B-2JF3-B	B38-7B	B-6BS6-B	BST-N4M	ST4M4-B
6125-24	B-6125-24	B14	B-3JM3-B	B38-8B	B-6BS8-B	BST-N6	ST6F6-B
6130-08	B-6130-08	B15	B-3JF3-B	B38J	B-6BM8-B	BST-N6M	ST6M6-B
6130-12	B-6130-12	B16	B-4CM4-B	B39	B-6BF6-B	BST-N8	ST8F8-B
6130-16	B-6130-16	B17	B-4CF4-B	B39F	B-6BF4-B	BST-N8M	ST8M8-B
6130-20	B-6130-20	B20-3B	B-2CS2-B	B39J	B-6BF8-B	EZ-251-4FP	SV3003
6130-24	B-6130-24	B20-3B	D342	B3C	B-J2F2-B	EZ-251-4HB	SV3603
6135-08	B-6135-08	B20-3BP	B-2CPS2-B	B50-3BP	B-2OPS2-B	EZ-251-4MP	SV3103
6135-12	B-6135-12	B20-3BP	D344	B50-5BP	B-2OPS3-B	EZ-251-4PL	SV1513
6135-16	B-6135-16	B20-5B	B-2CS3-B	B52	B-2OM2-B	EZ-251-6FP	SV3203
6135-20	B-6135-20	B20-5B	D362	B52E	B-2OM3-B	EZ-251-6HB	SV3703
6135-24	B-6135-24	B20-5BP	B-2CPS3-B	B53	B-2OF2-B	EZ-251-6MP	SV3303
6601-12-10	B-6601-12-10	B20-5BP	D364	B53E	B-2OF3-B	EZ-251-6PL	SV1713
6601-12-12	B-6601-12-12	B22	B-2CM2-B	B72	B-2LM2-B	EZ-371-6FP	SV4204
6601-16-16	B-6601-16-16	B22	D341	B73	B-2LF2-B	EZ-371-6HB	SV4804
6601-2-4	B-6601-2-4	B22A	B-2CM1-B	BH1-60	1DSF1-B	EZ-371-6MP	SV4304
6601-4-4	B-6601-4-4	B22A	D321	BH1-61	DS1F1-B	EZ-371-6PL	SV1714
6601-6-6	B-6601-6-6	B22E	B-2CM3-B	BH2-60	2DSF2-B	EZ-501-12FP	SV5405
6601-8-10	B-6601-8-10	B22E	D361	BH2-60-W	2DSF2-BI	EZ-501-8FP	SV5205
6602-12-10	B-6602-12-10	B23	B-2CF2-B	BH2-61	DS2F2-B	EZ-501-8HB	SV5805
6602-12-12	B-6602-12-12	B23	D340	BH2-61-W	DS2F2-BI	EZ-501-8MP	SV5305
6602-16-16	B-6602-16-16	B23A	B-2CF1-B	BH2C	B-B2M2-B	EZ-501-8PL	SV1815
6602-2-4	B-6602-2-4	B23A	D320	BH2E	B-B3M3-B	EZ-751-12FP	SV6406
6602-4-4	B-6602-4-4	B23E	B-2CF3-B	BH2F	B-B4M4-B	EZ-751-12MP	SV6506
6602-6-6	B-6602-6-6	B23E	D360	BH2G	B-B6M6-B	EZ-751-16FP	SV6606
6602-8-10	B-6602-8-10	B24	B-3CM3-B	BH3-60	3DSF3-B	FE-501-12FO	B-4FF6-FP-SAE
6608-12-10	B-6608-12-10	B25	B-3CF3-B	BH3-61	DS3F3-B	FE-502-12FO	B-FF4F6-FP-SAE
6608-12-12	B-6608-12-12	B2C	B-J2M2-B	BH3C	B-B2F2-B	FE501-8FP	B-4FF4-FP
6608-16-16	B-6608-16-16	B30-3B	B-2BS2-B	BH3E	B-B3F3-B	FE502-12FP	B-FF4F6-FP
6608-8-10	B-6608-8-10	B30-3BP	B-2BPS2-B	BH3F	B-B4F4-B	FF-371-6FP	B-3FF3-FP
6610-10-10	B-6610-10-10	B30-5B	B-2BS3-B	BH4-60	4DSF4-B	FF-371-8FP	B-3FF4-FP
6610-12-10	B-6610-12-10	B30-5BP	B-2BPS3-B	BH4-61	DS4F4-B	FF-372-6FP	B-FF3F3-FP
6610-12-12	B-6610-12-12	B32	B-2BM2-B	BH6-60	6DSF6-B	FF-372-8FP	B-FF3F4-FP
6610-16-16	B-6610-16-16	B32A	B-2BM1-B	BH6-61	DS6F6-B	FF502-8FP	B-FF4F4-FP
6610-8-10	B-6610-8-10	B32E	B-2BM3-B	BH8-60	8DSF8-B	FR-1001	PDC-8
6657-12M	B-6657-12	B33	B-2BF2-B	BH8-61	DS8F8-B	FR-1002	SDC-8
6657-16M	B-6657-16	B33-SL	B-2BF2-B-SL	BPN251F	B-BPN251F	FR-501	PDC-4
6659-12M	B-6659-12	B33A	B-2BF1-B	BPN252F	B-BPN252F	FR-502	SDC-4
6659-16M	B-6659-16	B33E	B-2BF3-B	BPN253F	B-BPN253F	FR-751	PDC-6
8010-15	B-8010-15	B34	B-3BM3-B	BPN352F	B-BPN352F	FR-752	SDC-6
8010-16	B-8010-16	B34-5B	B-3BS3-B	BPN353F	B-BPN353F	H0C	B-B2M1-S
8010-4	B-8010-4	B34-5BP	B-3BPS3-B	BST-1	1STF1-B	H0E	B-B3M2-S
8010-4P	B-8010-4P	B34-6B	B-3BS4-B	BST-1M	1STM1-B	H0F	B-B4M3-S
8010-5	B-8010-5	B34C	B-3BM2-B	BST-2	2STF2-B	H1-62	1DSF1-S
8C	B-J2S2-S	B34F	B-3BM4-B	BST-2M	2STM2-B	H1-63	DS1F1-S

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## Parker to BRECO Interchange [PAGE 3 OF 3]

H1-65	BH1-65	H6-66	BH6-66	PC316V-BP	B-PC316V-BP	SST-N2M	ST2M2-SS
H1-65M	B-6659-4	H6-66M	BH6-66M	PC318	B-PC318	SST-N3	ST3F3-SS
H1-65M	BH1-65M	H6E	B-B3S4-S	PC318-BP	B-PC318-BP	SST-N3M	ST3M3-SS
H1-66	BH1-66	H6EP	B-B3PS4-S	PC318V	B-PC318V	SST-N4	ST4F4-SS
H1-66M	B-6657-4	H8-62	8DSF8-S	PC318V-BP	B-PC318V-BP	SST-N4M	ST4M4-SS
H1-66M	BH1-66M	H8-63	DS8F8-S	PC326	B-PC326	SST-N6	ST6F6-SS
H1C	B-B2F1-S	H8-65	BH8-65	PC326-BP	B-PC326-BP	SST-N6M	ST6M6-SS
H1E	B-B3F2-S	H8-65M	BH8-65M	PC326V	B-PC326V	SST-N8	ST8F8-SS
H1F	B-B4F3-S	H8-66	BH8-66	PC326V-BP	B-PC326V-BP	SST-N8M	ST8M8-SS
H2-62	2DSF2-S	H8-66M	BH8-66M	PC328	B-PC328	ST-N1	ST1F1-S
H2-63	DS2F2-S	H8C	B-B2S2-S	PC328-BP	B-PC328-BP	ST-N1M	ST1M1-S
H2-65	BH2-65	H8C-D	B-B2S25-S	PC328V	B-PC328V	ST-N2	ST2F2-S
H2-65M	BH2-65M	H8CP	B-B2PS2-S	PC328V-BP	B-PC328V-BP	ST-N2M	ST2M2-S
H2-66	BH2-66	H9C	B-B2S3-S	PC504	B-PC504	ST-N3	ST3F3-S
H2-66M	BH2-66M	H9CP	B-B2PS3-S	PC504-BP	B-PC504-BP	ST-N3M	ST3M3-S
H2C	B-B2M2-S	L2C	B-L2M2-S	PC506	B-PC506	ST-N4	ST4F4-S
H2CE	B-B2M3-S	L3C	B-L2F2-S	PN251	B-PN251	ST-N4M	ST4M4-S
H2E	B-B3M3-S	NR-37	SDC-3	PN251F	B-PN251F	ST-N6	ST6F6-S
H2E-F	B-B3M4-S	NR-50	PDC-3	PN252	B-PN252	ST-N6M	ST6M6-S
H2F	B-B4M4-S	PC204	B-PC204	PN252F	B-PN252F	ST-N8	ST8F8-S
H2F-G	B-B4M6-S	PC204-AV	B-PC204AV	PN253	B-PN253	ST-N8M	ST8M8-S
H2G	B-B6M6-S	PC204-BP	B-PC204-BP	PN253F	B-PN253F	TL-251-4FP	B-2TLF2-S
H2G-F	B-B6M4-S	PC204AV-BP	B-PC204AV-BP	PN352	B-PN352	TL-251-4MP	B-2TLM2-S
H2G-J	B-B6M8-S	PC205	B-PC205	PN352F	B-PN352F	TL-251-6MP	B-2TLM3-S
H3-62	3DSF3-S	PC205AV	B-PC205AV	PN353	B-PN353	TL-254-2FP	B-TL2F1-S
H3-63	DS3F3-S	PC206	B-PC206	PN353F	B-PN353F	TL-254-2MP	B-TL2M1-S
H3-65	BH3-65	PC206-BP	B-PC206-BP	PN354	B-PN354	TL-254-4FP	B-TL2F2-S
H3-65M	BH3-65M	PC206AV	B-PC206AV	PN554	B-PN554	TL-254-4HB	B-TL2S2-S
H3-66	BH3-66	PC206AV-BP	B-PC206AV-BP	PN556	B-PN556	TL-254-4MP	B-TL2M2-S
H3-66M	BH3-66M	PC214	B-PC214	S22	B-2CM2-SS	TL-501-12FP	B-4TLF6-S
H3C	B-B2F2-S	PC214-BP	B-PC214-BP*	S23	B-2CF2-SS	TL-501-6FP	B-4TLF3-S
H3C-E	B-B2F3-S	PC214AV	B-PC214AV	SH1-62	1DSF1-SS	TL-501-6MP	B-4TLM3-S
H3E	B-B3F3-S	PC214AV-BP	B-PC214AV-BP	SH1-63	DS1F1-SS	TL-501-8FP	B-4TLF4-S
H3E-F	B-B3F4-S	PC215	B-PC215	SH2-62	2DSF2-SS	TL-501-8MP	B-4TLM4-S
H3F	B-B4F4-S	PC215AV	B-PC215AV	SH2-63	DS2F2-SS	TL-504-12MP	B-TL4M6-S
H3F-G	B-B4F6-S	PC216	B-PC216	SH2C	B-B2M2-SS	TL-504-4FP	B-TL4F2-S
H3G	B-B6F6-S	PC216-BP	B-PC216-BP	SH3-62	3DSF3-SS	TL-504-4MP	B-TL4M2-S
H3G-F	B-B6F4-S	PC216AV	B-PC216AV	SH3-63	DS3F3-SS	TL-504-6FP	B-TL4F3-S
H3G-J	B-B6F8-S	PC216AV-BP	B-PC216AV-BP	SH3C	B-B2F2-SS	TL-504-6MP	B-TL4M3-S
H4-62	4DSF4-S	PC224	B-PC224	SH4-62	4DSF4-SS	TL-504-8MP	B-TL4M4-S
H4-63	DS4F4-S	PC224-BP	B-PC224-BP*	SH4-63	DS4F4-SS	TR-37	B-6659-6
H4-65	BH4-65	PC224AV	B-PC224AV	SH6-62	6DSF6-SS	TR-37	B-6657-6
H4-65M	BH4-65M	PC224AV-BP	B-PC224AV-BP	SH6-63	DS6F6-SS	UC-251-4FP	B-2UF2-B
H4-66	BH4-66	PC225	B-PC225	SH8-62	8DSF8-SS	UC-251-4FP	DW340A
H4-66M	BH4-66M	PC225AV	B-PC225AV	SH8-63	DS8F8-SS	UC-251-4MP	B-2UM2-B
H4EP	B-B3PS2-S	PC226	B-PC226	SST-1	1STF1-SS	UC-251-4MP	DW341A
H4F	B-B4S3-S	PC226-BP	B-PC226-BP	SST-1M	1STM1-SS	UC-251-6FP	DW360A
H4FP	B-B4PS3-S	PC226AV	B-PC226AV	SST-2	2STF2-SS	UC-251-6MP	DW361A
H5E	B-B3S3-S	PC226AV-BP	B-PC226AV-BP	SST-2M	2STM2-SS		
H5EP	B-B3PS3-S	PC306	B-PC306	SST-3	3STF3-SS		
H5F	B-B4S4-S	PC306-BP	B-PC306-BP	SST-3M	3STM3-SS		
H5F-G	B-B4S6-S	PC306V	B-PC306V	SST-4	4STF4-SS		
H5FP	B-B4PS4-S	PC306V-BP	B-PC306V-BP	SST-4M	4STM4-SS		
H5G	B-B6S6-S	PC308	B-PC308	SST-6	6STF6-SS		
H5G-F	B-B6S4-S	PC308-BP	B-PC308-BP	SST-6M	6STM6-SS		
H5G-J	B-B6S8-S	PC308V	B-PC308V	SST-8	8STF8-SS		
H6-62	6DSF6-S	PC308V-BP	B-PC308V-BP	SST-8M	8STM8-SS		
H6-63	DS6F6-S	PC316	B-PC316	SST-N1	ST1F1-SS		
H6-65	BH6-65	PC316-BP	B-PC316-BP	SST-N1M	ST1M1-SS		
H6-65M	BH6-65M	PC316V	B-PC316V	SST-N2	ST2F2-SS		

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## PCC to BRECO Interchange [PAGE 1 OF 3]

10WDP-B	B-6109-20	2FF2-S	B-2CF2-SS	3CM4B3-B	B-PC326V-BP	3JF2	B-3JF2-S
10WF10-B	B-6125-20	2FF3-B	B-2CF3-B	3CM4B3-B-E	B-PC326-BP	3JF3	B-3JF3-S
12WDP-B	B-6109-24	2FF3-B	D360	3CM4B4-B	B-PC328V-BP	3JF4	B-3JF4-S
12WF12-B	B-6125-24	2FM1-B	B-2CM1-B	3CM4B4-B-E	B-PC328-BP	3JM2	B-3JM2-S
1EF1-B	1STF1-B	2FM1-B	D321	3CM4S3-B	B-PC326V	3JM3	B-3JM3-S
1EF1-S	1STF1-SS	2FM2-B	B-2CM2-B	3CM4S3-B-E	B-PC326	3JM4	B-3JM4-S
1EM1-B	1STM1-B	2FM2-B	D341	3CM4S4-B	B-PC328V	3JS3	B-3JS3-S
1EM1-S	1STM1-SS	2FM2-S	B-2CM2-SS	3CM4S4-B-E	B-PC328	3JS4	B-3JS4-S
1HF1	1DSF1-S	2FM3-B	B-2CM3-B	3CM9B3-B	B-PC316V-BP	3KDP	B-6659-6
1HF1-B	1DSF1-B	2FM3-B	D361	3CM9B3-B-E	B-PC316-BP	3KF3	B-6601-6-6
1HF1-S	1DSF1-SS	2FS2-B	B-2CS2-B	3CM9B4-B	B-PC318V-BP	3MF3-PL	B-30F3-S
2AGDP	B-5205-2M	2FS2-B	D342	3CM9B4-B-E	B-PC318-BP	3MM3-PL	B-30M3-S
2AGF2	B-4050-2P	2FS2.5-B	B-2CS25-B	3CM9S3-B	B-PC316V	3TDP	B-3005-3
2AGF2-PV	B-4050-2	2FS3-B	B-2CS3-B	3CM9S3-B-E	B-PC316	3TF3	B-3WF3-S
2CM4B2-B	B-PC224AV-BP	2FS3-B	D362	3CM9S4-B	B-PC318V	3TM3	B-3WM3-S
2CM4B2-B-E	B-PC224-BP*	2HDP	BH2-65M	3CM9S4-B-E	B-PC318	3UF3-B	DW460A
2CM4B3-B	B-PC226AV-BP	2HDP-A	BH2-65	3CMB3-B	B-PC306V-BP	3UM3-B	DW461A
2CM4B3-B-E	B-PC226-BP	2HF2	2DSF2-S	3CMB3-B-E	B-PC306-BP	3US3-B	DW462A
2CM4S2-B	B-PC224AV	2HF2-B	2DSF2-B	3CMB4-B	B-PC308V-BP	3VF3	B-VHC6-6F
2CM4S2-B-E	B-PC224	2HF2-S	2DSF2-SS	3CMB4-B-E	B-PC308-BP	3VF3-B	B-VHC6-6F-B
2CM4S2.5-B	B-PC225AV	2JB2-B	B-2JPS2-B	3CMS3-B	B-PC306V	3VF3-B-E	B-PHC6-6F-B
2CM4S2.5-B-E	B-PC225	2JB3-B	B-2JPS3-B	3CMS3-B-E	B-PC306	3VF3-E	B-PHC6-6F
2CM4S3-B	B-PC226AV	2JF1-B	B-2JF1-B	3CMS4-B	B-PC308V	3VM3	B-VHC6-6M
2CM4S3-B-E	B-PC226	2JF2-B	B-2JF2-B	3CMS4-B-E	B-PC308	3VM3-B	B-VHC6-6M-B
2CM9B2-B	B-PC214AV-BP	2JF3-B	B-2JF3-B	3DB3-B	B-3BPS3-B	3VM3-B-E	B-PHC6-6M-B
2CM9B2-B-E	B-PC214-BP*	2JM2-B	B-2JM2-B	3DF2-B	B-3BF2-B	3VM3-E	B-PHC6-6M
2CM9B3-B	B-PC216AV-BP	2JM3-B	B-2JM3-B	3DF3-B	B-3BF3-B	4AGF4	B-4050-4
2CM9B3-B-E	B-PC216-BP	2JS2-B	B-2JS2-B	3DF4-B	B-3BF4-B	4AGF4-PV	B-4050-4P
2CM9S2-B	B-PC214AV	2JS3-B	B-2JS3-B	3DM2-B	B-3BM2-B	4AGF6	B-4050-5
2CM9S2-B-E	B-PC214	2KDP	B-6659-4	3DM3-B	B-3BM3-B	4AGOF4	B-4050-15
2CM9S2.5-B	B-PC215AV	2KF1	B-6601-2-4	3DM4-B	B-3BM4-B	4AGOF5	B-4050-16
2CM9S2.5-B-E	B-PC215	2KF2	B-6601-4-4	3DS2-B	B-3BS2-B	4CMB4-B-E	B-PC504-BP
2CM9S3-B	B-PC216AV	2LF2-B	B-2LF2-B	3DS3-B	B-3BS3-B	4CMS4-B-E	B-PC504
2CM9S3-B-E	B-PC216	2LM2-B	B-2LM2-B	3DS4-B	B-3BS4-B	4CMS6-B-E	B-PC506
2CMB2-B	B-PC204AV-BP	2MF2-B	B-2OF2-B	3EF3-B	3STF3-B	4DB4-B	B-4BFS4-B
2CMB2-B-E	B-PC204-BP	2MF2-PL	B-2OF2-S	3EF3-S	3STF3-SS	4DF3-B	B-4BFS3-B
2CMB3-B	B-PC206AV-BP	2MF3-B	B-2OF3-B	3EM3-B	3STM3-B	4DF4-B	B-4BF4-B
2CMB3-B-E	B-PC206-BP	2MM2-B	B-2OM2-B	3EM3-S	3STM3-SS	4DF6-B	B-4BF6-B
2CMS2-B	B-PC204AV	2MM2-PL	B-2OM2-S	3FB3	B-3CPS3-S	4DM3-B	B-4BM3-B
2CMS2-B-E	B-PC204	2MM3-B	B-2OM3-B	3FB3	D464	4DM4-B	B-4BM4-B
2CMS2.5-B	B-PC205AV	2MS2-B	B-2OS2-B	3FF2	B-3CF2-S	4DM6-B	B-4BM6-B
2CMS2.5-B-E	B-PC205	2MS3-B	B-2OS3-B	3FF2	D440	4DS3-B	B-4BS3-B
2CMS3-B	B-PC206AV	2SHDF2	B-2TLF2-S	3FF3	B-3CF3-S	4DS4-B	B-4BS4-B
2CMS3-B-E	B-PC206	2SHDF3	B-2TLF3-S	3FF3	D460	4DS6-B	B-4BS6-B
2DB2-B	B-2BPS2-B	2SHDM2	B-2TLM2-S	3FF4	B-3CF4-S	4EF4-B	4STF4-B
2DB3-B	B-2BPS3-B	2SHDM3	B-2TLM3-S	3FF4	D480	4EF4-S	4STF4-SS
2DF1-B	B-2BF1-B	2TDP	B-3005-2	3FM2	B-3CM2-S	4EM4-B	4STM4-B
2DF2-B	B-2BF2-B	2TM2	B-2WM2-S	3FM2	D441	4EM4-S	4STM4-SS
2DF3-B	B-2BF3-B	2UF2-B	B-2UF2-B	3FM3	B-3CM3-S	4FB3	B-4CPS3-S
2DM1-B	B-2BM1-B	2UF2-B	DW340A	3FM3	D461	4FB4	B-4CPS4-S
2DM2-B	B-2BM2-B	2UF3-B	DW360A	3FM4	B-3CM4-S	4FB4	D584
2DM3-B	B-2BM3-B	2UM2-B	B-2UM2-B	3FM4	D481	4FF3	B-4CF3-S
2DS2-B	B-2BS2-B	2UM2-B	DW341A	3FS2	D442	4FF3	D560
2DS3-B	B-2BS3-B	2UM3-B	DW361A	3FS3	B-3CS3-S	4FF4	B-4CF4-S
2EF2-B	2STF2-B	2US2-B	DW342A	3FS3	D462	4FF4	D580
2EF2-S	2STF2-SS	2US3-B	DW362A	3FS4	B-3CS4-S	4FF6	B-4CF6-S
2EM2-B	2STM2-B	2VF2	B-VHC4-4F	3FS4	D482	4FM3	B-4CM3-S
2EM2-S	2STM2-SS	2VF2-B	B-VHC4-4F-B	3HDP	BH3-65M	4FM3	D561
2FB2-B	B-2CPS2-B	2VF2-B-E	B-PHC4-4F-B	3HDP-A	BH3-65	4FM4	B-4CM4-S
2FB2-B	D344	2VF2-E	B-PHC4-4F	3HF3	3DSF3-S	4FM4	D581
2FB3-B	B-2CPS3-B	2VM2	B-VHC4-4M	3HF3-B	3DSF3-B	4FM6	B-4CM6-S
2FB3-B	D364	2VM2-B	B-VHC4-4M-B	3HF3-S	3DSF3-SS	4FM6	D5121
2FF1-B	B-2CF1-B	2VM2-B-E	B-PHC4-4M-B	3HTDP	PDC-3	4FS3	B-4CS3-S
2FF1-B	D320	2VM2-E	B-PHC4-4M	3HTF3	B-3FF3-FP	4FS3	D562
2FF2-B	B-2CF2-B	3AGDP	B-5205-3	3HTF4	B-3FF4-FP	4FS4	B-4CS4-S
2FF2-B	D340	3AGF3	B-4050-3	3JB3	B-3JPS3-S	4FS4	D582

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## PCC to BRECO Interchange [PAGE 2 OF 3]

4FS6	B-4CS6-S	6WF6-B	B-6125-12	D2M3	B-B2M3-S	E6M6	ST6M6-S
4FS6	D5122	8AGDP	B-5205-6	D2S2	B-B2S2-S	E6M6-B	ST6M6-B
4HDP	BH4-65M	8AGF8	B-4050-6	D2S2.5	B-B2S25-S	E6M6-S	ST6M6-SS
4HDP-A	BH4-65	8AGF8-PV	B-4050-6P	D2S3	B-B2S3-S	E8F8	ST8F8-S
4HF4	4DSF4-S	8EF8-B	8STF8-B	D3B3	B-B3PS3-S	E8F8-B	ST8F8-B
4HF4-B	4DSF4-B	8EF8-S	8STF8-SS	D3B4	B-B3PS4-S	E8F8-S	ST8F8-SS
4HF4-S	4DSF4-SS	8EM8-B	8STM8-B	D3F2	B-B3F2-S	E8M8	ST8M8-S
4HTDP	PDC-4	8EM8-S	8STM8-SS	D3F3	B-B3F3-S	E8M8-B	ST8M8-B
4HTF4	B-4FF4-FP	8HDP	BH8-65M	D3F3-B	B-B3F3-B	E8M8-S	ST8M8-SS
4HTF6	B-4FF6-FP	8HDP-A	BH8-65	D3F4	B-B3F4-S	H1F1	DS1F1-S
4HTOF4	B-4FF4-FP-SAE	8HF8	8DSF8-S	D3M2	B-B3M2-S	H1F1-B	DS1F1-B
4HTOF6	B-4FF6-FP-SAE	8HF8-B	8DSF8-B	D3M3	B-B3M3-S	H1F1-S	DS1F1-SS
4KDP	B-5205-4M	8HF8-S	8DSF8-SS	D3M3-B	B-B3M3-B	H2DC	BH2-66M
4KDP	B-6659-10	8HTDP	PDC-8	D3M4	B-B3M4-S	H2DC-A	BH2-66
4KF4	B-6601-8-10	8HTF8	B-8FF8-FP	D3S2	B-B3S2-S	H2F2	DS2F2-S
4KF6	B-6601-12-10	8KDP	B-6659-16	D3S3	B-B3S3-S	H2F2-B	DS2F2-B
4KOF4	B-6608-8-10	8KF8	B-6601-16-16	D3S4	B-B3S4-S	H2F2-S	DS2F2-SS
4SHDF3	B-4TLF3-S	8KOF8	B-6608-16-16	D4B4	B-B4PS4-S	H3DC	BH3-66M
4SHDF4	B-4TLF4-S	8WDP-B	B-6109-16	D4F3	B-B4F3-S	H3DC-A	BH3-66
4SHDF6	B-4TLF6-S	8WF8-B	B-6125-16	D4F4	B-B4F4-S	H3F3	DS3F3-S
4SHDM3	B-4TLM3-S	AG2DC	B-5209-2M	D4F4-B	B-B4F4-B	H3F3-B	DS3F3-B
4SHDM4	B-4TLM4-S	AG2F2	B-4010-2	D4F6	B-B4F6-S	H3F3-S	DS3F3-SS
4VF4	B-VHC8-8F	AG2F2-PV	B-4010-2P	D4M2	B-B4M2-S	H4DC	BH4-66M
4VF4-B	B-VHC8-8F-B	AG3DP	B-5209-3	D4M3	B-B4M3-S	H4DC-A	BH4-66
4VF4-B-E	B-PHC8-8F-B	AG3F3	B-4010-3	D4M4	B-B4M4-S	H4F4	DS4F4-S
4VF4-E	B-PHC8-8F	AG4F4	B-8010-4	D4M4-B	B-B4M4-B	H4F4-B	DS4F4-B
4VM4	B-VHC8-8M	AG4F4-PV	B-8010-4P	D4M6	B-B4M6-S	H4F4-S	DS4F4-SS
4VM4-B	B-VHC8-8M-B	AG4F6	B-8010-5	D4S3	B-B4S3-S	H6DC	BH6-66M
4VM4-B-E	B-PHC8-8M-B	AG4OF4	B-8010-15	D4S4	B-B4S4-S	H6DC-A	BH6-66
4VM4-E	B-PHC8-8M	AG4OF5	B-8010-16	D4S6	B-B4S6-S	H6F6	DS6F6-S
6AGDP	B-5205-5	AG6DC	B-5209-5	D6F4	B-B6F4-S	H6F6-B	DS6F6-B
6AGF6	B-4150-5	AG6F6	B-4110-5	D6F6	B-B6F6-S	H6F6-S	DS6F6-SS
6DF4-B	B-6BF4-B	AG8DC	B-5209-6	D6F8	B-B6F8-S	H8DC	BH8-66M
6DF6-B	B-6BF6-B	AG8F8	B-4010-6	D6M4	B-B6M4-S	H8DC-A	BH8-66
6DF8-B	B-6BF8-B	AG8F8-PV	B-4010-6P	D6M6	B-B6M6-S	H8F8	DS8F8-S
6DM4-B	B-6BM4-B	B3B2	B-B3PS2-S	D6M8	B-B6M8-S	H8F8-B	DS8F8-B
6DM6-B	B-6BM6-B	CM2F1	B-PN251F	D6S4	B-B6S4-S	H8F8-S	DS8F8-SS
6DM8-B	B-6BM8-B	CM2F1-B	B-BPN251F	D6S6	B-B6S6-S	HT3DC	SDC-3
6DS4-B	B-6BS4-B	CM2F2	B-PN252F	D6S8	B-B6S8-S	HT3F3	B-FF3F3-FP
6DS6-B	B-6BS6-B	CM2F2-B	B-BPN252F	E1F1	ST1F1-S	HT3F4	B-FF3F4-FP
6DS8-B	B-6BS8-B	CM2F3	B-PN253F	E1F1-B	ST1F1-B	HT4DC	SDC-4
6EF6-B	6STF6-B	CM2F3-B	B-BPN253F	E1F1-S	ST1F1-SS	HT4F4	B-FF4F4-FP
6EF6-S	6STF6-SS	CM2M1-B	B-PN251	E1M1	ST1M1-S	HT4F6	B-FF4F6-FP
6EM6-B	6STM6-B	CM2M2-B	B-PN252	E1M1-B	ST1M1-B	HT4OF4	B-FF4F4-FP-SAE
6EM6-S	6STM6-SS	CM2M3-B	B-PN253	E1M1-S	ST1M1-SS	HT4OF6	B-FF4F6-FP-SAE
6HDP	BH6-65M	CM3F2	B-PN352F	E2F2	ST2F2-S	HT6DC	SDC-6
6HDP-A	BH6-65	CM3F2-B	B-BPN352F	E2F2-B	ST2F2-B	HT6F6	B-FF6F6-FP
6HF6	6DSF6-S	CM3F3	B-PN353F	E2F2-S	ST2F2-SS	HT6OF6	B-FF6F6-FP-SAE
6HF6-B	6DSF6-B	CM3F3-B	B-BPN353F	E2M2	ST2M2-S	HT8DC	SDC-8
6HF6-S	6DSF6-SS	CM3M2-B	B-PN352	E2M2-B	ST2M2-B	HT8F8	B-FF8F8-FP
6HTDP	PDC-6	CM3M3-B	B-PN353	E2M2-S	ST2M2-SS	J2B2	B-J2PS2-S
6HTF6	B-6FF6-FP	CM3M4-B	B-PN354	E3F3	ST3F3-S	J2B3	B-J2PS3-S
6HTOF6	B-6FF6-FP-SAE	CM4M4-B	B-PN554	E3F3-B	ST3F3-B	J2F1	B-J2F1-S
6KDP	B-6659-12	CM4M6-B	B-PN556	E3F3-S	ST3F3-SS	J2F2	B-J2F2-S
6KF6	B-6601-12-12	D2B2	B-B2PS2-S	E3M3	ST3M3-S	J2F2-B	B-J2F2-B
6KOF6	B-6608-12-12	D2B3	B-B2PS3-S	E3M3-B	ST3M3-B	J2F3	B-J2F3-S
6VF6	B-VHC12-12F	D2E2	B-B2E2-S	E3M3-S	ST3M3-SS	J2M1	B-J2M1-S
6VF6-B	B-VHC12-12F-B	D2F1	B-B2F1-S	E4F4	ST4F4-S	J2M2	B-J2M2-S
6VF6-B-E	B-PHC12-12F-B	D2F2	B-B2F2-S	E4F4-B	ST4F4-B	J2M2-B	B-J2M2-B
6VF6-E	B-PHC12-12F	D2F2-B	B-B2F2-B	E4F4-S	ST4F4-SS	J2M3	B-J2M3-S
6VM6	B-VHC12-12M	D2F2-S	B-B2F2-SS	E4M4	ST4M4-S	J2S2	B-J2S2-S
6VM6-B	B-VHC12-12M-B	D2F3	B-B2F3-S	E4M4-B	ST4M4-B	J2S3	B-J2S3-S
6VM6-B-E	B-PHC12-12M-B	D2M1	B-B2M1-S	E4M4-S	ST4M4-SS	J3B3	B-J3PS3-S
6VM6-E	B-PHC12-12M	D2M2	B-B2M2-S	E6F6	ST6F6-S	J3F2	B-J3F2-S
6WDP-B	B-6109-08	D2M2-B	B-B2M2-B	E6F6-B	ST6F6-B	J3F3	B-J3F3-S
6WF4-B	B-6125-08	D2M2-S	B-B2M2-SS	E6F6-S	ST6F6-SS	J3M2	B-J3M2-S

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## PCC to BRECO Interchange [PAGE 3 OF 3]

J3M3	B-J3M3-S	M2M2	B-O2M2-S	V2F2-E	B-PHN4-4F	V6F6-E	B-PHN12-12F
J3S3	B-J3S3-S	M2M3	B-O2M3-S	V2M2	B-VHN4-4M	V6M6	B-VHN12-12M
K2DC	B-6657-4	M2S2	B-O2S2-S	V2M2-B	B-VHN4-4M-B	V6M6-B	B-VHN12-12M-B
K2F1	B-6602-2-4	M2S3	B-O2S3-S	V2M2-B-E	B-PHN4-4M-B	V6M6-B-E	B-PHN12-12M-B
K2F2	B-6602-4-4	M3F3	B-O3F3-S	V2M2-E	B-PHN4-4M	V6M6-E	B-PHN12-12M
K3DC	B-6657-6	M3M3	B-O3M3-S	V3F3	B-VHN6-6F	W10-BMF	B-6107-20
K3F3	B-6602-6-6	P-2HF2-B	2DSF2-BI	V3F3-B	B-VHN6-6F-B	W10DC-B	B-6108-20
K4DC	B-5209-4M	P-H2F2-B	DS2F2-BI	V3F3-B-E	B-PHN6-6F-B	W10F10-B	B-6105-20
K4DC	B-6657-10	SHD2F1	B-TL2F1-S	V3F3-E	B-PHN6-6F	W12-BMF	B-6107-24
K4F4	B-6602-8-10	SHD2F2	B-TL2F2-S	V3M3	B-VHN6-6M	W12DC-B	B-6108-24
K4F6	B-6602-12-10	SHD2M1	B-TL2M1-S	V3M3-B	B-VHN6-6M-B	W12F12-B	B-6105-24
K4OF4	B-6610-8-10	SHD2M2	B-TL2M2-S	V3M3-B-E	B-PHN6-6M-B	W6-BMF	B-6107-08
K4OF5	B-6610-10-10	SHD2S2	B-TL2S2-S	V3M3-E	B-PHN6-6M	W6DC-B	B-6108-08
K6DC	B-6657-12	SHD4F3	B-TL4F3-S	V4F4	B-VHN8-8F	W6F4-B	B-6105-08
K6F6	B-6602-12-12	SHD4M2	B-TL4M2-S	V4F4-B	B-VHN8-8F-B	W6F6-B	B-6105-12
K6OF6	B-6610-12-12	SHD4M3	B-TL4M3-S	V4F4-B-E	B-PHN8-8F-B	W8-BMF	B-6107-16
K8DC	B-6657-16	SHD4M4	B-TL4M4-S	V4F4-E	B-PHN8-8F	W8DC-B	B-6108-16
K8F8	B-6602-16-16	T2DC	B-3009-2	V4M4	B-VHN8-8M	W8F8-B	B-6105-16
K8OF8	B-6610-16-16	T2F2	B-W2F2-S	V4M4-B	B-VHN8-8M-B		
L2F2	B-L2F2-S	T3DC	B-3009-3	V4M4-B-E	B-PHN8-8M-B		
L2M2	B-L2M2-S	T3F3	B-W3F3-S	V4M4-E	B-PHN8-8M		
M2F2	B-O2F2-S	V2F2	B-VHN4-4F	V6F6	B-VHN12-12F		
M2F3	B-O2F3-S	V2F2-B	B-VHN4-4F-B	V6F6-B	B-VHN12-12F-B		
M2M1	B-O2M1-S	V2F2-B-E	B-PHN4-4F-B	V6F6-B-E	B-PHN12-12F-B		

## PCI to BRECO Interchange [PAGE 1 OF 2]

1-FP	ST8F8-S	B-12-FC	4STF4-B	FF08-N12M	B-FF4F4-FP	HNV-34-M	DS6F6-S
1-MP	ST8M8-S	B-12-FP	ST4F4-B	FF08-N34F	B-4FF6-FP	HNV-34-M-2	DS6F6-SS
12-FP	ST4F4-S	B-12-MC	4STM4-B	FF08-N34M	B-FF4F6-FP	HNV-34-M-5	DS6F6-B
12-MP	ST4M4-S	B-12-MP	ST4M4-B	FF08-S34F	B-4FF4-FP-SAE	HNV-38-F	3DSF3-S
14-FP	ST2F2-S	B-14-FC	2STF2-B	FF08-S34M	B-FF4F4-FP-SAE	HNV-38-F-2	3DSF3-SS
14-MP	ST2M2-S	B-14-FP	ST2F2-B	FF12-N34F	B-6FF6-FP	HNV-38-F-5	3DSF3-B
18-FP	ST1F1-S	B-14-MC	2STM2-B	FF12-N34M	B-FF6F6-FP	HNV-38-M	DS3F3-S
18-MP	ST1M1-S	B-14-MP	ST2M2-B	FF12-S1116F	B-6FF6-FP-SAE	HNV-38-M-2	DS3F3-SS
2NS-12-M	B-8010-4	B-18-FC	1STF1-B	FF12-S1116M	B-FF6F6-FP-SAE	HNV-38-M-5	DS3F3-B
2NV-12-UNF-M	B-8010-15	B-18-FP	ST1F1-B	HNV-1-F	8DSF8-S	I-10-3	B-B2M2-S
2NV-12-UNF-M	B-6610-8-10	B-18-MC	1STM1-B	HNV-1-F-2	8DSF8-SS	I-11-3	B-B2F2-S
34-FP	ST6F6-S	B-18-MP	ST1M1-B	HNV-1-F-5	8DSF8-B	I-12-3	B-B2M1-S
34-MP	ST6M6-S	B-34-FC	6STF6-B	HNV-1-M	DS8F8-S	I-13-3	B-B2F1-S
38-FP	ST3F3-S	B-34-FP	ST6F6-B	HNV-1-M-2	DS8F8-SS	I-14-3	B-B2M3-S
38-MP	ST3M3-S	B-34-MC	6STM6-B	HNV-1-M-5	DS8F8-B	I-15-3	B-B2F3-S
53-A	B-B4F2-S	B-34-MP	ST6M6-B	HNV-12-F	4DSF4-S	I-2803-A	B-2BF1-B
A210-10	B-O2M2-S	B-38-FC	3STF3-B	HNV-12-F-2	4DSF4-SS	I-2803-M	B-2CF1-B
A210-11	B-O2F2-S	B-38-FP	ST3F3-B	HNV-12-F-5	4DSF4-B	I-2803-M	D320
A210-3003	B-2OF2-S	B-38-MC	3STM3-B	HNV-12-M	DS4F4-S	I-2903-A	B-2BM1-B
A210-3103	B-2OM2-S	B-38-MP	ST3M3-B	HNV-12-M-2	DS4F4-SS	I-2903-M	B-2CM1-B
A310-42	B-O3M3-S	C-3003M-SS	B-2CF2-SS	HNV-12-M-5	DS4F4-B	I-2903-M	D321
A310-43	B-O3F3-S	FB-24-F	B-6125-24	HNV-14-F	2DSF2-S	I-3003-A	B-2BF2-B
ANV-1-F	B-6601-16-16	FB-08-F	B-6125-08	HNV-14-F-2	2DSF2-SS	I-3003-M	B-2CF2-B
ANV-1-M	B-6602-16-16	FB-08-M	B-6105-08	HNV-14-F-5	2DSF2-B	I-3003-M	D340
ANV-12-M	B-6602-8-10	FB-12-F	B-6125-12	HNV-14-M	DS2F2-S	I-3103-A	B-2BM2-B
ANV-14-F	B-6601-4-4	FB-12-M	B-6105-12	HNV-14-M-2	DS2F2-SS	I-3103-M	B-2CM2-B
ANV-14-M	B-6602-4-4	FB-16-B	B-6125-16	HNV-14-M-5	DS2F2-B	I-3103-M	D341
ANV-34-F	B-6601-12-12	FB-16-M	B-6105-16	HNV-18-F	1DSF1-S	I-3203-A	B-2BF3-B
ANV-34-M	B-6602-12-12	FB-20-F	B-6125-20	HNV-18-F-2	1DSF1-SS	I-3203-M	B-2CF3-B
ANV-34-SAE-M	B-6610-12-12	FB-20-M	B-6105-20	HNV-18-F-5	1DSF1-B	I-3203-M	D360
ANV-38-F	B-6601-6-6	FB-24-M	B-6105-24	HNV-18-M	DS1F1-S	I-3303-A	B-2BM3-B
ANV-38-M	B-6602-6-6	FF06-N12F	B-3FF4-FP	HNV-18-M-2	DS1F1-SS	I-3303-M	B-2CM3-B
B-1-FC	8STF8-B	FF06-N12M	B-FF3F4-FP	HNV-18-M-5	DS1F1-B	I-3303-M	D361
B-1-FP	ST8F8-B	FF06-N38F	B-3FF3-FP	HNV-34-F	6DSF6-S	I-40-4	B-B3M2-S
B-1-MC	8STM8-B	FF06-N38M	B-FF3F3-FP	HNV-34-F-2	6DSF6-SS	I-4004-A	B-3BF2-B
B-1-MP	ST8M8-B	FF08-N12F	B-4FF4-FP	HNV-34-F-5	6DSF6-B	I-4004-M	B-3CF2-S

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I-4004-M I-41-4 I-4104-A	D440 B-B3F2-S B-3BM2-B	I-55-5 I-5505-A I-56-5	B-B4F4-S B-4BM6-B B-B4M6-S	PT-2803-M PT-3003-M PT-3103-M	B-2JF1-B B-2JF2-B B-2JM2-B	SS-34-FC SS-34-FP SS-34-MC	6STF6-SS ST6F6-SS 6STM6-SS
I-4104-M I-4104-M I-42-4	B-3CM2-S D441 B-B3M3-S	I-57-5 I-6206-A I-6306-A	B-B4F6-S B-6BF4-B B-6BM4-B	PT-3203-M PT-3303-M PT-40	B-2JF3-B B-2JM3-B B-J3M2-S	SS-34-MP SS-38-FC SS-38-FP	ST6M6-SS 3STF3-SS ST3F3-SS
I-4204-A I-4204-M I-4204-M	B-3BF3-B B-3CF3-S D460	I-64-6 I-6406-A I-65-6	B-B6M4-S B-6BF6-B B-B6F4-S	PT-4004-M PT-41 PT-4104-M	B-3JF2-S B-J3F2-S B-3JM2-S	SS-38-MC SS-38-MP TNV-04-F	3STM3-SS ST3M3-SS B-VHC4-4F
I-43-4 I-4304-A I-4304-M	B-B3F3-S B-3BM3-B B-3CM3-S	I-6506-A I-66-6 I-6606-A	B-6BM6-B B-B6M6-S B-6BF8-B	PT-42 PT-4204-M PT-43	B-J3M3-S B-3JF3-S B-J3F3-S	TNV-04-F-02 TNV-04-F-5 TNV-04-M	B-VHC4-4M B-VHC4-4F-B B-VHN4-4F
I-44-4 I-4404-A I-4404-M	B-B3M4-S B-3BF4-B B-3CF4-S	I-67-6 I-6706-A I-68-6	B-B6F6-S B-6BM8-B B-B6M8-S	PT-4304-M PT-4404-M PT-4504-M	B-3JM3-S B-3JF4-S B-3JM4-S	TNV-04-M-02 TNV-04-M-5 TNV-06-F	B-VHN4-4M B-VHN4-4F-B B-VHC6-6F
I-4404-M I-45-4 I-4504-A	D480 B-B3F4-S B-3BM4-B	I-69-6 NS-12-F NS-38-F	B-B6F8-S B-4050-4 B-4050-3	PV-12/34-F PVV-14-F PVV-14-M	B-4050-5 B-2WM2-S B-W2F2-S	TNV-06-F-02 TNV-06-F-5 TNV-06-M	B-VHC6-6M B-VHC6-6F-B B-VHN6-6F
I-4504-M I-50-5 I-5005-A	B-3CM4-S B-B4M2-S B-4BF3-B	NS-38-M NSP-34-F NSP-34-M	B-4010-3 B-4150-5 B-4110-5	PVV-38-F PVV-38-M SS-1-FC	B-3WM3-S B-W3F3-S 8STF8-SS	TNV-06-M-02 TNV-06-M-5 TNV-08-F	B-VHN6-6M B-VHN6-6F-B B-VHC8-8F
I-5005-M I-5005-M I-5105-A	B-4CF3-S D560 B-4BM3-B	NV-1-F NV-1-M NV-12-F	B-4050-6 B-4010-6 B-4050-4P	SS-1-FP SS-1-MC SS-1-MP	ST8F8-SS 8STM8-SS ST8M8-SS	TNV-08-F-02 TNV-08-F-5 TNV-08-M	B-VHC8-8M B-VHC8-8F-B B-VHN8-8F
I-5105-M I-5105-M I-52-5	B-4CM3-S D561 B-B4M3-S	NV-12-F NV-12-M NV-12-UNF-F	B-6601-8-10 B-8010-4P B-4050-15	SS-12-FC SS-12-FP SS-12-MC	4STF4-SS ST4F4-SS 4STM4-SS	TNV-08-M-02 TNV-08-M-5 TNV-12-F	B-VHN8-8M B-VHN8-8F-B B-VHC12-12F
I-5205-A I-5205-M I-5205-M	B-4BF4-B B-4CF4-S D580	NV-12-UNF-F NV-14-F NV-14-M	B-6608-8-10 B-4050-2P B-4010-2P	SS-12-MP SS-14-FC SS-14-FP	ST4M4-SS 2STF2-SS ST2F2-SS	TNV-12-F-02 TNV-12-F-5 TNV-12-M	B-VHC12-12M B-VHC12-12F-B B-VHN12-12F
I-53-5 I-5305-A I-5305-M	B-B4F3-S B-4BM4-B B-4CM4-S	PT-10 PT-11 PT-12	B-J2M2-S B-J2F2-S B-J2M1-S	SS-14-MC SS-14-MP SS-18-FC	2STM2-SS ST2M2-SS 1STF1-SS	TNV-12-M-02 TNV-12-M-5	B-VHN12-12M B-VHN12-12F-B
I-5305-M I-54-5 I-5405-A	D581 B-B4M4-S B-4BF6-B	PT-13 PT-14 PT-15	B-J2F1-S B-J2M3-S B-J2F3-S	SS-18-FP SS-18-MC SS-18-MP	ST1F1-SS 1STM1-SS ST1M1-SS		

## Safeway to BRECO Interchange

BS-101-1 BS-101-3 BS-101-4	DS1F1-B DS3F3-B DS4F4-B	FFE495-3-8 FFE495-4 S101-1	B-3FF4-FP B-4FF4-FP DS1F1-S	S31-3 S35-2 S35-3	B-W3F3-S B-2WM2-S B-3WF3-S	S71-4 S71-4P S801-2F	B-8010-4 B-8010-4P B-O2F2-S	SS-101-4 SS-101-6 SS-101-8	DS4F4-SS DS6F6-SS DS8F8-SS
BS-101-6 BS-101-8 BS-105-1	DS6F6-B DS8F8-B 1DSF1-B	S101-2 S101-3 S101-4	DS2F2-S DS3F3-S DS4F4-S	S41-2P S41-3 S511W-10	B-4010-2P B-4010-3 B-6105-20	S801-2M S805-2 S821-2F	B-O2M2-S B-2OF2-B B-B2F2-S	SS-105-1 SS-105-2 SS-105-3	1DSF1-SS 2DSF2-SS 3DSF3-SS
BS-105-2 BS-105-3 BS-105-4	2DSF2-B 3DSF3-B 4DSF4-B	S101-6 S101-8 S105-1	DS6F6-S DS8F8-S 1DSF1-S	S511W-6 S511W-8 S515-W10	B-6105-12 B-6105-16 B-6125-20	S821-2M S821-3-2F S821-3-2M	B-B2M2-S B-B3F2-S B-B3M2-S	SS-105-4 SS-105-6 SS-105-8	4DSF4-SS 6DSF6-SS 8DSF8-SS
BS-105-6 BS-105-8 BS101-2	6DSF6-B 8DSF8-B DS2F2-B	S105-2 S105-3 S105-4	2DSF2-S 3DSF3-S 4DSF4-S	S515-W6 S515W-8 S561-2	B-6125-12 B-6125-16 B-6602-4-4	S821-3F S821-3M S825-2	B-B3F3-S B-B3M3-S B-2CF2-B		
FFE-491-6 FFE-491-8 FFE-495-6	B-FF6F6-FP B-FF8F8-FP B-6FF6-FP	S105-6 S105-8 S21F-6	6DSF6-S 8DSF8-S B-4110-5	S561-3 S561-4 S561-6	B-6602-6-6 B-6602-8-10 B-6602-12-12	S825-2 S825-2M S825-2M	D340 B-2CM2-B D341		
FFE-495-8 FFE491-3 FFE491-3-8	B-8FF8-FP B-FF3F3-FP B-FF3F4-FP	S25-3 S25-4 S25-4P	B-4050-3 B-4050-4 B-4050-4P	S561-8 S565-2 S565-3	B-6602-16-16 B-6601-4-4 B-6601-6-6	S825-3 S825-3 S825-3M	B-3CF3-S D460 B-3CM3-S		
FFE491-4 FFE491-4-3/4 FFE495-3	B-FF4F4-FP B-FF4F6-FP B-3FF3-FP	S25-8P S25A-2P S25F-6	B-4050-6 B-4050-2P B-4150-5	S565-4 S565-6 S565-8	B-6601-8-10 B-6601-12-12 B-6601-16-16	SS-101-1 SS-101-2 SS-101-3	DS1F1-SS DS2F2-SS DS3F3-SS		

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## Snap-Tite to BRECO Interchange

60C4-4F	B-4050-2P	74N8-8F	B-FF4F4-FP	BPHN6-6F	B-PHN6-6F-B	PHN6-6M	B-PHN6-6M
60N4-4F	B-4010-2P	B72C12-12F	6DSF6-B	BPHN6-6M	B-PHN6-6M-B	PHN8-8F	B-PHN8-8F
61C-12-12	B-6601-12-12	B72C16-16F	8DSF8-B	BPHN8-8F	B-PHN8-8F-B	PHN8-8M	B-PHN8-8M
61C-16-16	B-6601-16-16	B72C4-4F	2DSF2-B	BPHN8-8M	B-PHN8-8M-B	S72C12-12F	6DSF6-SS
61C-4-4	B-6601-4-4	B72C6-6F	3DSF3-B	BVHC12-12F	B-VHC12-12F-B	S72C16-16F	8DSF8-SS
61C6-6F	B-6601-6-6	B72C8-8F	4DSF4-B	BVHC12-12M	B-VHC12-12M-B	S72C4-4F	2DSF2-SS
61C8-8F	B-6601-8-10	B72N12-12F	DS6F6-B	BVHC4-4F	B-VHC4-4F-B	S72C6-6F	3DSF3-SS
61N-12-12	B-6602-12-12	B72N16-16F	DS8F8-B	BVHC4-4M	B-VHC4-4M-B	S72C8-8F	4DSF4-SS
61N-16-16	B-6602-16-16	B72N4-4F	DS2F2-B	BVHC6-6F	B-VHC6-6F-B	S72N12-12F	DS6F6-SS
61N-4-4	B-6602-4-4	B72N6-6F	DS3F3-B	BVHC6-6M	B-VHC6-6M-B	S72N16-16F	DS8F8-SS
61N6-6F	B-6602-6-6	B72N8-8F	DS4F4-B	BVHC8-8F	B-VHC8-8F-B	S72N4-4F	DS2F2-SS
61N8-8F	B-6602-8-10	B78C12-12F	B-6125-12	BVHC8-8M	B-VHC8-8M-B	S72N6-6F	DS3F3-SS
72C12-12F	6DSF6-S	B78C12-8F	B-6125-08	BVHN12-12F	B-VHN12-12F-B	S72N8-8F	DS4F4-SS
72C16-16F	8DSF8-S	B78C16-16F	B-6125-16	BVHN12-12M	B-VHN12-12M-B	VHC12-12F	B-VHC12-12F
72C4-4F	2DSF2-S	B78C20-20F	B-6125-20	BVHN4-4F	B-VHN4-4F-B	VHC12-12M	B-VHC12-12M
72C6-6F	3DSF3-S	B78C24-24F	B-6125-24	BVHN4-4M	B-VHN4-4M-B	VHC4-4F	B-VHC4-4F
72C8-8F	4DSF4-S	B78N12-12F	B-6105-12	BVHN6-6F	B-VHN6-6F-B	VHC4-4M	B-VHC4-4M
72N12-12F	DS6F6-S	B78N12-8F	B-6105-08	BVHN6-6M	B-VHN6-6M-B	VHC6-6F	B-VHC6-6F
72N16-16F	DS8F8-S	B78N16-16F	B-6105-16	BVHN8-8F	B-VHN8-8F-B	VHC6-6M	B-VHC6-6M
72N4-4F	DS2F2-S	B78N20-20F	B-6105-20	BVHN8-8M	B-VHN8-8M-B	VHC8-8F	B-VHC8-8F
72N6-6F	DS3F3-S	B78N24-24F	B-6105-24	PHC12-12F	B-PHC12-12F	VHC8-8M	B-VHC8-8M
72N8-8F	DS4F4-S	BPHC12-12F	B-PHC12-12F-B	PHC12-12M	B-PHC12-12M	VHN12-12F	B-VHN12-12F
74C12-12EF	B-6FF6-FP-SAE	BPHC12-12M	B-PHC12-12M-B	PHC4-4F	B-PHC4-4F	VHN12-12M	B-VHN12-12M
74C16-16F	B-8FF8-FP	BPHC4-4F	B-PHC4-4F-B	PHC4-4M	B-PHC4-4M	VHN4-4F	B-VHN4-4F
74C6-6F	B-3FF3-FP	BPHC4-4M	B-PHC4-4M-B	PHC6-6F	B-PHC6-6F	VHN4-4M	B-VHN4-4M
74C6-8F	B-3FF4-FP	BPHC6-6F	B-PHC6-6F-B	PHC6-6M	B-PHC6-6M	VHN6-6F	B-VHN6-6F
74C8-8F	B-4FF4-FP	BPHC6-6M	B-PHC6-6M-B	PHC8-8F	B-PHC8-8F	VHN6-6M	B-VHN6-6M
74N12-12EF	B-FF6F6-FP-SAE	BPHC8-8F	B-PHC8-8F-B	PHC8-8M	B-PHC8-8M	VHN8-8F	B-VHN8-8F
74N12-12F	B-FF6F6-FP	BPHC8-8M	B-PHC8-8M-B	PHN12-12F	B-PHN12-12F	VHN8-8M	B-VHN8-8M
74N16-16F	B-FF8F8-FP	BPHN12-12F	B-PHN12-12F-B	PHN12-12M	B-PHN12-12M		
74N6-6F	B-FF3F3-FP	BPHN12-12M	B-PHN12-12M-B	PHN4-4F	B-PHN4-4F		
74N6-8F	B-FF3F4-FP	BPHN4-4F	B-PHN4-4F-B	PHN4-4M	B-PHN4-4M		
74N8-12F	B-FF4F6-FP	BPHN4-4M	B-PHN4-4M-B	PHN6-6F	B-PHN6-6F		

## Stucci to BRECO Interchange

F-8WF8-B	B-6125-16	F.IRBOV100NPT	8DSF8-B	M.BIR12NPT	B-8010-4P	M.IRBX18NPT	DS1F1-SS
F.10WF10-B	B-6125-20	F.IRBOV12NPT	4DSF4-B	M.BIR14NPT	B-6602-4-4	M.IRBX34NPT	DS6F6-SS
F.6WF6-B	B-6125-12	F.IRBOV14NPT	2DSF2-B	M.BIR38NPT	B-6602-6-6	M.IRBX38NPT	DS3F3-SS
F.A131/2NPT	B-4FF4-FP	F.IRBOV18NPT	1DSF1-B	M.FIRG12ANPT	B-FF4F4-FP	M.IRV14NPT	B-4010-2P
F.A173/4NPT	B-6FF6-FP	F.IRBOV34NPT	6DSF6-B	M.FIRG12NPT	B-FF3F4-FP	M.IVHP38NPT	B-W3F3-S
F.A173/4SAE	B-6FF6-FP-SAE	F.IRBOV38NPT	3DSF3-B	M.FIRG38NPT	B-FF3F3-FP	M.W10F10-B	B-6105-20
F.A211NPT	B-8FF8-FP	F.IRBX100NPT	8DSF8-SS	M.IR12NPT	B-8010-4	M.W6F6-B	B-6105-12
F.A91/2NPT	B-3FF4-FP	F.IRBX12NPT	4DSF4-SS	M.IR34NPT	B-4110-5	M.W8F8-B	B-6105-16
F.A93/8NPT	B-3FF3-FP	F.IRBX14NPT	2DSF2-SS	M.IR38NPT	B-4010-3		
F.BIR100NPT	B-6601-16-16	F.IRBX18NPT	1DSF1-SS	M.IRB100NPT	DS8F8-S		
F.BIR12NPT	B-4050-4P	F.IRBX34NPT	6DSF6-SS	M.IRB12NPT	DS4F4-S		
F.BIR12NPT	B-6601-8-10	F.IRBX38NPT	3DSF3-SS	M.IRB14NPT	DS2F2-S		
F.BIR14NPT	B-6601-4-4	F.IRV100NPT	B-4050-6	M.IRB18NPT	DS1F1-S		
F.BIR34NPT	B-6601-12-12	F.IRV14NPT	B-4050-2P	M.IRB34NPT	DS6F6-S		
F.BIR38NPT	B-6601-6-6	F.IVHP14NPT	B-2WM2-S	M.IRB38NPT	DS3F3-S		
F.IR12NPT	B-4050-4	F.IVHP38NPT	B-3WF3-S	M.IRBOV100NPT	DS8F8-B		
F.IR34NPT	B-4150-5	M.BIR34NPT	B-6602-12-12	M.IRBOV12NPT	DS4F4-B		
F.IR38NPT	B-4050-3	M.A131/2SAE	B-FF4F4-FP-SAE	M.IRBOV14NPT	DS2F2-B		
F.IRB100NPT	8DSF8-S	M.A133/4NPT	B-FF4F6-FP	M.IRBOV18NPT	DS1F1-B		
F.IRB12NPT	4DSF4-S	M.A173/4NPT	B-FF6F6-FP	M.IRBOV34NPT	DS6F6-B		
F.IRB14NPT	2DSF2-S	M.A173/4SAE	B-FF6F6-FP-SAE	M.IRBOV38NPT	DS3F3-B		
F.IRB18NPT	1DSF1-S	M.A211NPT	B-FF8F8-FP	M.IRBX100NPT	DS8F8-SS		
F.IRB34NPT	6DSF6-S	M.BIR100NPT	B-6602-16-16	M.IRBX12NPT	DS4F4-SS		
F.IRB38NPT	3DSF3-S	M.BIR12NPT	B-6602-8-10	M.IRBX14NPT	DS2F2-SS		

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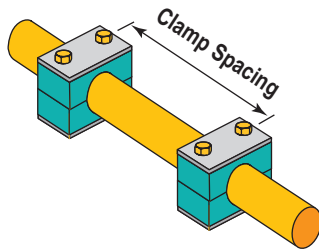


## Tomco to BRECO Interchange

100	B-20F2-B	C4-31	B-4050-5	PA5604-10	B-6610-10-10	SP8M-S	ST8M8-S	T5400	B-4BF6-B
101	B-20M2-B	C4-8	B-4050-15	PA5604-26	B-6602-8-10	ST1	1STF1-B	T55	B-B4F4-S
104	B-20S2-B	C6-31	B-4150-5	PA5604-31	B-6602-12-10	ST1-303	1STF1-SS	T5500	B-4BM6-B
105	B-20S3-B	C8-36	B-4050-6	PA5604-8	B-6610-8-10	ST1M	1STM1-B	T56	B-B4M6-S
106	B-20F3-B	CA5602-16	B-6601-4-4	PA5606-31	B-6602-12-12	ST1M-303	1STM1-SS	T57	B-B4F6-S
107	B-20M3-B	CA5603-21	B-6601-6-6	PA5608-36	B-6602-16-16	ST2	2STF2-B	T570	B-4CS3-S
1100	B-2LF2-B	CA5604-26	B-6601-8-10	PT400	B-3CF2-S	ST2-303	2STF2-SS	T570	D562
1109	B-L2M2-S	CA5604-31	B-6601-12-10	PT400	B-3JF2-S	ST2M	2STM2-B	T5700	B-4BS3-B
1110	B-L2F2-S	CA5604-8	B-6608-8-10	PT400	D440	ST2M-303	2STM2-SS	T580	B-4CS4-S
180	B-2BM1-B	CA5606-31	B-6601-12-12	PT410	B-3CM2-S	ST3	3STF3-B	T580	D582
1802	B-B2M1-S	CA5608-36	B-6601-16-16	PT410	B-3JM3-S	ST3-303	3STF3-SS	T5800	B-4BS4-B
1803	B-B2F1-S	D9-1	B-2BK3-B	PT410	D441	ST3M	3STM3-B	T59	B-B4S3-S
1804	B-B2M2-S	EC3-21	B-3FF3-FP	PT420	B-3JF3-S	ST3M-303	3STM3-SS	T590	B-4CS6-S
1805	B-B2F2-S	EC3-26	B-3FF4-FP	PT420	B-3CF3-S	ST4	4STF4-B	T590	D5122
1806	B-B2M3-S	EC4-26	B-4FF4-FP	PT420	D460	ST4-303	4STF4-SS	T5900	B-4BS6-B
1807	B-B2F3-S	EC4-31	B-4FF6-FP	PT430	B-3JM4-S	ST4M	4STM4-B	T60	B-B4S4-S
181	B-2BM2-B	EC6-31	B-6FF6-FP	PT430	B-3CM3-S	ST4M-303	4STM4-SS	T61	B-B4S6-S
182	B-2BM3-B	EC8-36	B-8FF8-FP	PT440	B-3CF4-S	ST6	6STF6-B	TB3-1	B-B2E2-S
1824	B-B2S2-S	EP3-21	B-FF3F3-FP	PT440	B-3JF4-S	ST6M	6STM6-B	TB7-1	B-B2H3-S
1826	B-B2S3-S	EP3-26	B-FF3F4-FP	PT440	D480	ST8	8STF8-B	TD9-1	B-B2K3-S
183	B-2BF1-B	EP4-26	B-FF4F4-FP	PT450	B-3CM4-S	ST8M	8STM8-B	TH1-11	1DSF1-S
184	B-2BF2-B	EP4-31	B-FF4F6-FP	PT480	B-3CS3-S	T40	B-J3M2-S	TH1-11-002	1DSF1-B
185	B-2BF3-B	EP6-31	B-FF6F6-FP	PT480	B-3JS3-S	T40	B-B3M2-S	TH1-11-303	1DSF1-SS
186	B-2BS2-B	EP8-36	B-FF8F8-FP	PT480	D462	T4000	B-3BF2-B	TH2-16	2DSF2-S
187	B-2BS3-B	JC2-15	B-2WM2-S	PT480P	B-3CPS3-S	T41	B-J3F2-S	TH2-16-002	2DSF2-B
200	B-O2M2-S	JC3-20	B-3WM3-S	PT480P	D464	T41	B-B3F2-S	TH2-16-303	2DSF2-SS
202	B-O2M1-S	JP2-16	B-W2F2-S	PT490	B-3CS4-S	T4100	B-3BM2-B	TH3-21	3DSF3-S
2152	B-J2M1-S	JP3-21	B-W3F3-S	PT490	B-3JS4-S	T42	B-J3M3-S	TH3-21-002	3DSF3-B
2153	B-J2F1-S	M180	B-2CM1-B	PT490	D482	T42	B-B3M3-S	TH3-21-303	3DSF3-SS
2154	B-J2M2-S	M180	D321	SP1	ST1F1-B	T4200	B-3BF3-B	TH4-26	4DSF4-S
2155	B-J2F2-S	M181	B-2CM2-B	SP1-303	ST1F1-SS	T43	B-J3F3-S	TH4-26-002	4DSF4-B
2156	B-J2M3-S	M181	D341	SP1-S	ST1F1-S	T43	B-B3F3-S	TH4-26-303	4DSF4-SS
2157	B-J2F3-S	M182	B-2CM3-B	SP1M	ST1M1-B	T4300	B-3BM3-B	TH6-31	6DSF6-S
2164	B-J2S2-S	M182	D361	SP1M-303	ST1M1-SS	T44	B-B3M4-S	TH6-31-002	6DSF6-B
2166	B-J2S3-S	M183	B-2CF1-B	SP1M-S	ST1M1-S	T4400	B-3BF4-B	TH6-31-303	6DSF6-SS
2181	B-2JM2-B	M183	D320	SP2	ST2F2-B	T45	B-B3F4-S	TH8-36	8DSF8-S
2182	B-2JM3-B	M184	B-2CF2-B	SP2-303	ST2F2-SS	T4500	B-3BM4-B	TH8-36-002	8DSF8-B
2183	B-2JF1-B	M184	D340	SP2-S	ST2F2-S	T48	B-J3S3-S	TH8-36-303	8DSF8-SS
2184	B-2JF2-B	M185	B-2CF3-B	SP2M	ST2M2-B	T48	B-B3S3-S	TK1-11	DS1F1-S
2185	B-2JF3-B	M185	D360	SP2M-303	ST2M2-SS	T4800	B-3BS3-B	TK1-11-002	DS1F1-B
2186	B-2JS2-B	M186	B-2CS2-B	SP2M-S	ST2M2-S	T4800F	B-3BPS3-B	TK1-11-303	DS1F1-SS
2188	B-2JS3-B	M186	D342	SP3	ST3F3-B	T48P	B-J3PS3-S	TK2-16	DS2F2-S
300	B-O2F2-S	M187	B-2CS3-B	SP3-303	ST3F3-SS	T49	B-B3S4-S	TK2-16-002	DS2F2-B
400	B-O2S2-S	M187	D362	SP3-S	ST3F3-S	T4900	B-3BS4-B	TK2-16-303	DS2F2-SS
500	B-O2S3-S	MB3-1	B-2CE2-B	SP3M	ST3M3-B	T50	B-B4M2-S	TK3-21	DS3F3-S
51P-12	B-6105-12	MB5-1	B-2CG2-B	SP3M-303	ST3M3-SS	T500	B-4CF3-S	TK3-21-002	DS3F3-B
51P-16	B-6105-16	MB7-1	B-2CH2-B	SP3M-S	ST3M3-S	T500	D560	TK3-21-303	DS3F3-SS
51P-20	B-6105-20	MD7-1	B-2CH3-B	SP4	ST4F4-B	T5000	B-4BF3-B	TK4-26	DS4F4-S
51P-8	B-6105-08	MD9-1	B-2CK3-B	SP4-303	ST4F4-SS	T510	B-4CM3-S	TK4-26-002	DS4F4-B
51W-12	B-6125-12	P2-16	B-4010-2P	SP4-S	ST4F4-S	T510	D561	TK4-26-303	DS4F4-SS
51W-16	B-6125-16	P3-21	B-4010-3	SP4M	ST4M4-B	T5100	B-4BM3-B	TK6-31	DS6F6-S
51W-20	B-6125-20	P4-10	B-8010-16	SP4M-303	ST4M4-SS	T52	B-B4M3-S	TK6-31-002	DS6F6-B
51W-8	B-6125-08	P4-26	B-8010-4P	SP4M-S	ST4M4-S	T520	B-4CF4-S	TK6-31-303	DS6F6-SS
B3-1	B-2BE2-B	P4-26	B-8010-4	SP6	ST6F6-B	T520	D580	TK8-36	DS8F8-S
B7-1	B-2BH2-B	P4-31	B-8010-5	SP6-S	ST6F6-S	T5200	B-4BF4-B	TK8-36-002	DS8F8-B
C2-16	B-4050-2P	P4-8	B-8010-15	SP6M	ST6M6-B	T53	B-B4F3-S	TK8-36-303	DS8F8-SS
C3-21	B-4050-3	P6-31	B-4110-5	SP6M-S	ST6M6-S	T530	B-4CM4-S	TLC-15	B-2TLM2-S
C4-10	B-4050-16	P8-36	B-4010-6	SP8	ST8F8-B	T530	D581	TLC-16	B-2TLF2-S
C4-26	B-4050-4P	PA5602-16	B-6602-4-4	SP8-S	ST8F8-S	T5300	B-4BM4-B	TLC-20	B-2TLM3-S
C4-26	B-4050-4	PA5603-21	B-6602-6-6	SP8M	ST8M8-B	T54	B-B4M4-S		

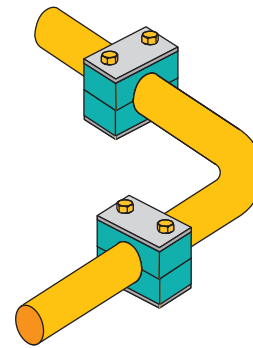
Note: Interchange is based on best available information. We cannot guarantee the accuracy and recommend confirmation of detailed specifications prior to ordering.

## Recommended Pipe Clamp Spacing



Pipe O.D.		Spacing	
in	mm	ft - in.	m
0.24" – 0.5"	6 – 12.7	3' - 3"	1.0
0.5" – 0.87"	12.7 – 22	3' - 11"	1.2
0.87" – 1.26"	22 – 32	4' - 11"	1.5
1.26" – 1.5"	32 – 38	6' - 7"	2.0
1.5" – 2.24"	38 – 57	8' - 10"	2.7
2.24" – 2.95"	57 – 75	9' - 10"	3.0
2.95" – 3"	75 – 76.1	11' - 6"	3.5
3" – 3.5"	76.1 – 88.9	12' - 2"	3.7
3.5" – 4"	88.9 – 102	13' - 1"	4.0
4" – 4.5"	102 – 114	14' - 9"	4.5
4.5" – 6.6"	114 – 168	16' - 5"	5.0
6.6" – 8.6"	168 – 219	19' - 8"	6.0
8.6" – 12.8"	219 – 324	21' - 12"	6.7
12.8" – 14"	324 – 356	22' - 12"	7.0
14" – 16"	356 – 406	24' - 7"	7.5
16" – 16.5"	406 – 419	26' - 11"	8.2
16.5" – 20"	419 – 508	27' - 11"	8.5
20" – 20.5"	508 – 521	29' - 6"	9.0
20.5" – 22"	521 – 558	32' - 10"	10.0
22" – 31.5"	558 – 800	41' - 0"	12.5

## Recommended Clamping for Bends



Bends in the line should be clamped on BOTH sides of the bend as shown.

## BETA CLAMP MATERIAL PROPERTIES

Material Properties		Polypropylene (PP)
Density	–	0.906 g/cm <sup>3</sup>
Tensile strength	DIN 53454	25-35 N/mm <sup>2</sup>
Flexure stress limit	DIN 53452	36N N/mm <sup>2</sup>
Compressive strength	DIN 53454	90 N/mm <sup>2</sup>
Impact strength	DIN 53453	No break
Thermo Properties		Polypropylene (PP)
Max. temp. resistance		-30 to 90°C
Thermal conductivity		15 x 10 <sup>-5</sup> /°C
Linear expansion coeff.		0.22 W/[mk]
Electrical Properties		Polypropylene (PP)
Specific volume	DIN 53482	1016 ohm x cm
Chemical Properties		Polypropylene (PP)
Consistent for weak acids, solvents, mineral oils and seawater.		

## Tightening Torque

Clamp	Group	Bolt Size	Aluminum Cushion		Polypropylene Cushion		Polyamide Cushion	
			Lbf	Nm	Lbf	Nm	Lbf	Nm
Beta Standard	S1 - S7	1/4"-20	7	10	6	8	6	8
Beta Heavy	H3, H4	3/8"-16	22	30	9	12	15	20
	H5	3/8"-16	26	35	11	15	18	25
	H6	1/2"-13	41	55	29	30	30	40
	H7	5/8"-11	89	120	33	45	41	55
Beta Twin	T1	1/4"-20	-	-	4	6	4	6
	T2 - T5	5/16"-18	-	-	9	12	9	12

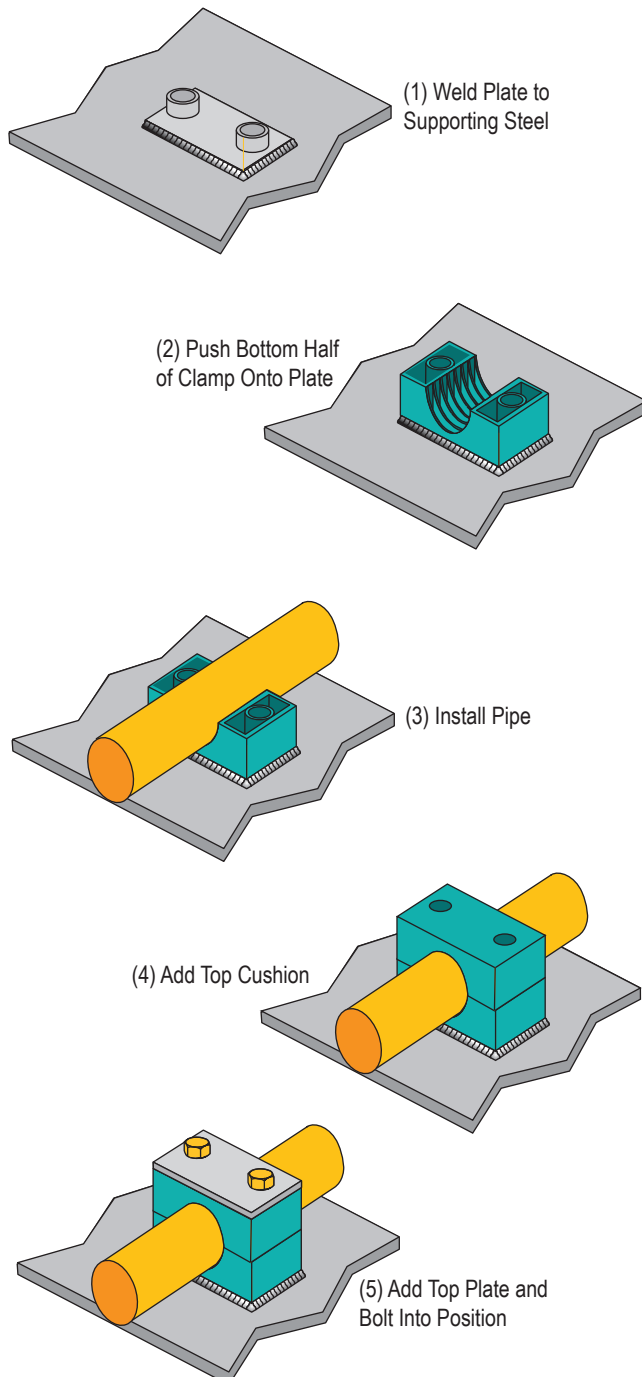
The outlined particulars are approximate values and are only valid as references, which are not binding, also with regard to possible protection of third parties, and they do not exempt you from your own examination of suitability of the products delivered by us. Therefore, these values can only be used in a limited sense for construction purposes. The application of the products is carried out outside our control possibilities and, therefore, is exclusively subject to your own area of responsibility. If, however, liability should be possible, it would be limited for all damages to the value of the goods supplied by us and in use by you. It goes without saying, that we guarantee the perfect quality of our products according to our general sales and delivery conditions.

## INSTALLATION ON WELD PLATES

ZSi weld plates are available for the following Series:

- Standard-Series
- Heavy-Series
- Twin-Series
- Beta Adapters

For best alignment of ZSi clamps we recommend that you mark their location before welding.



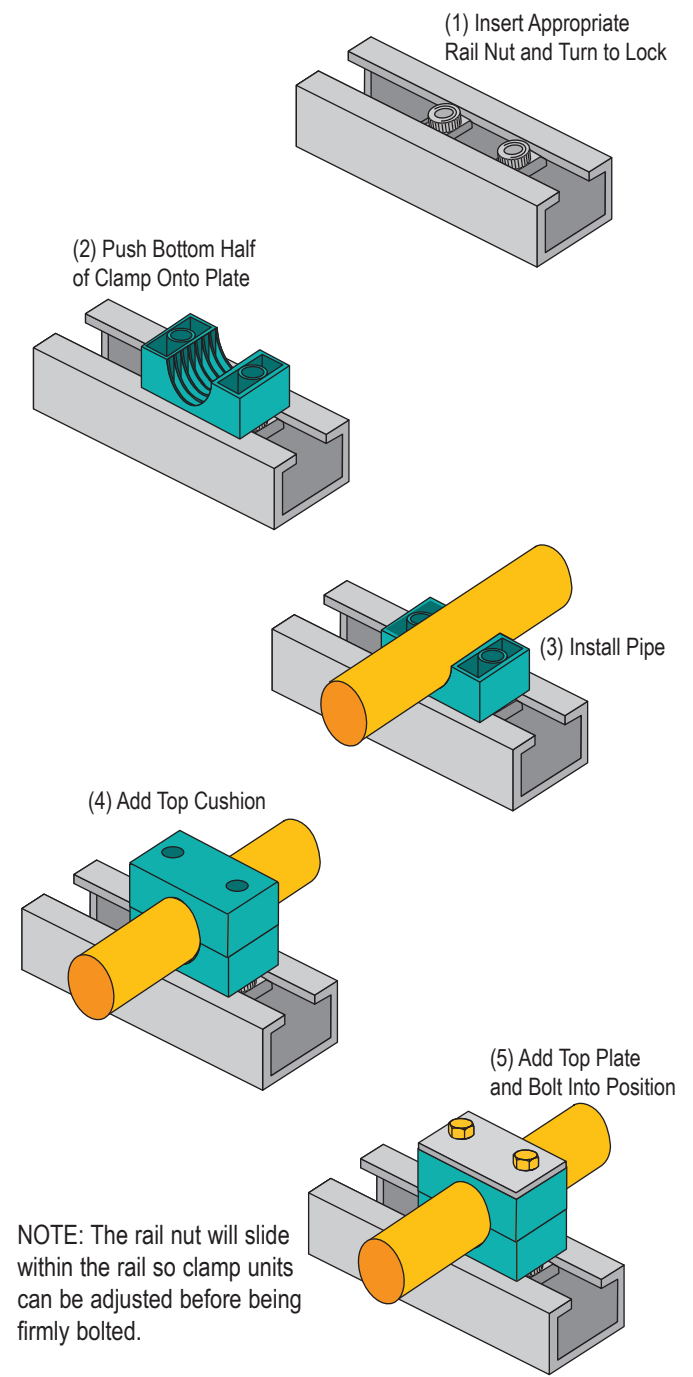
## INSTALLATION ON MOUNTING RAILS

ZSi mounting rails can be used with the following Series:

- Standard-Series
- Heavy-Series (Group H3 to H6)
- Twin-Series
- Beta Adapters

ZSi mounting rails are available in two different height sizes and are either welded or bolted to the supporting construction.

For Standard-Series and Twin-Series insert hexagon rail nut and turn to lock. For Heavy-Series slide in rail nut.



NOTE: The rail nut will slide within the rail so clamp units can be adjusted before being firmly bolted.

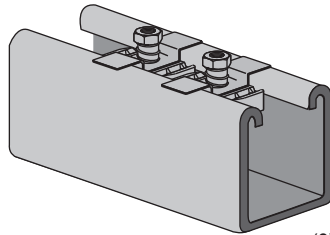
# Beta Clamp Installation



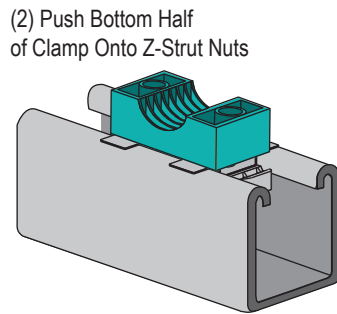
## INSTALLATION ON Z-STRUT CHANNEL

The Z-Strut Nuts can be used with any clamp using a 1/4-20 mounting bolt. This includes:

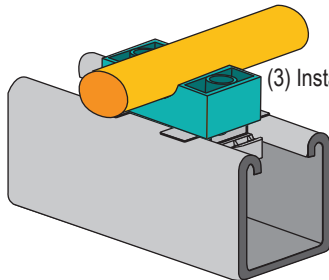
- Standard-Series
- Twin-Series (T1 Only)
- Beta Rubber Inserts



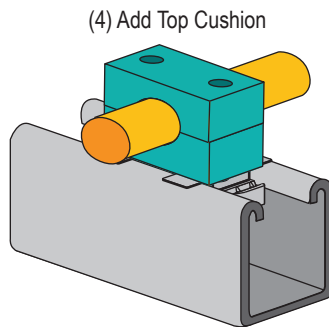
(1) Insert Z-Strut Nuts Into Z-Strut Channel And Turn to Lock



(2) Push Bottom Half of Clamp Onto Z-Strut Nuts

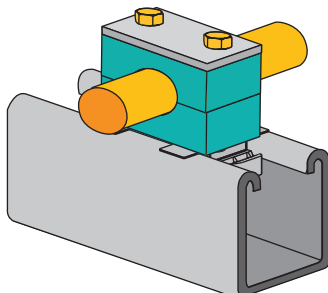


(3) Install Pipe



(4) Add Top Cushion

(5) Add Top Plate and Bolt Into Position



NOTE: The Z-Strut Nut will slide within the Z-Strut Channel so clamp units can be adjusted before being firmly bolted.

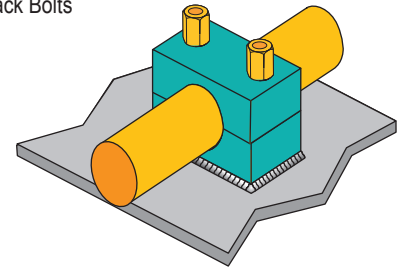
## MULTI-LEVEL ASSEMBLY

ZSi multi-level pipe clamps permit easy stacking of several tubes or pipes of the same group. The clamps are connected by stacking bolts.

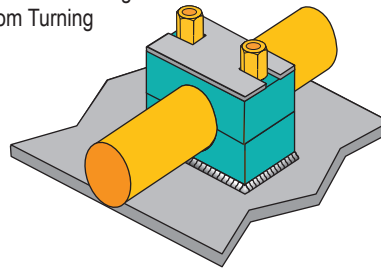
Safety plates are inserted between the clamps to prevent the stacking bolts from turning.

The example below shows a stacking clamp added to a welded clamp, however, ZSi stacking assemblies can be fitted to weld plates, rails, or strut in the same manner.

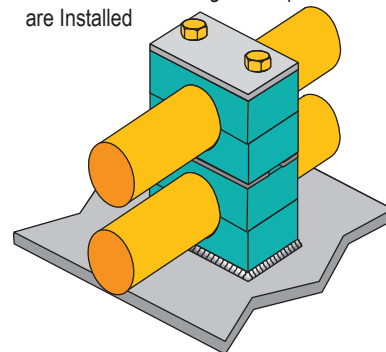
(1) After the Top Cushion is Added, Secure it with the Stack Bolts



(2) Add Safety Plate to Prevent Stacking Bolts from Turning

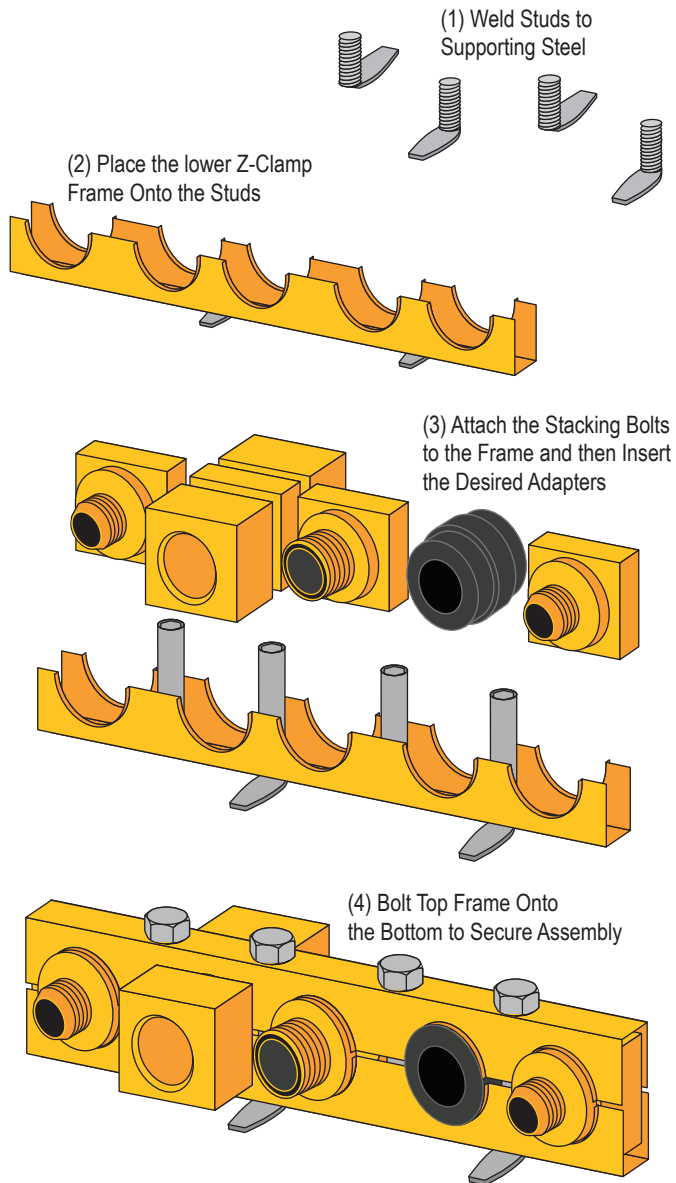


(2) Assemble Another Clamp Onto the Stacking Bolt in Same Manner as Single Clamps are Installed



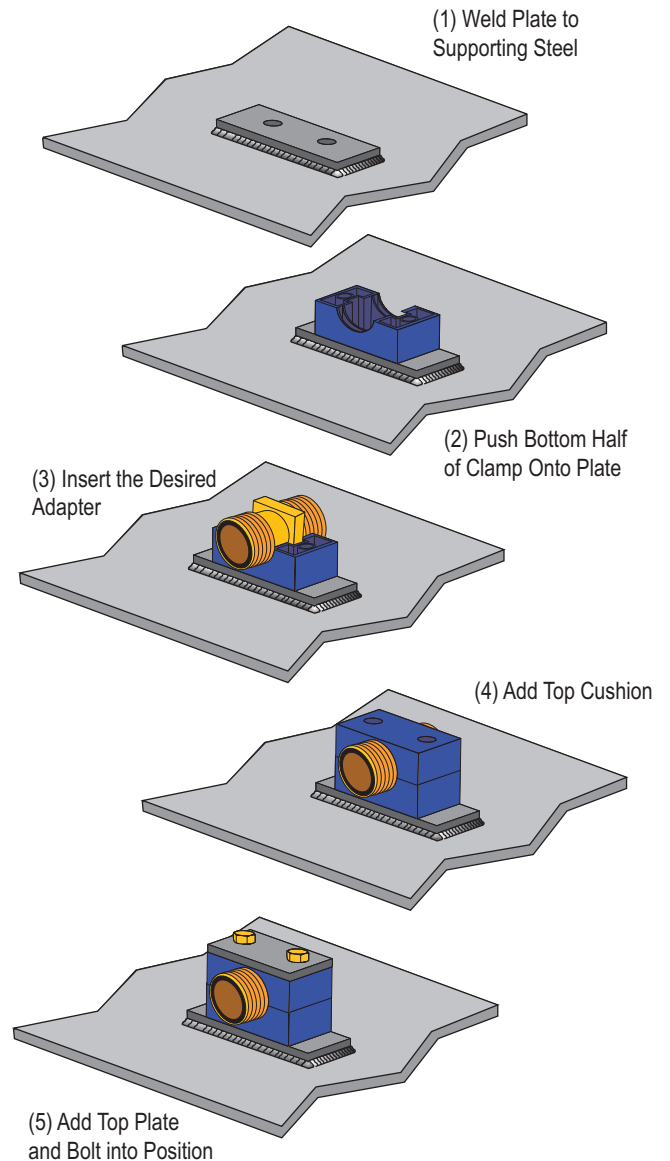
## Installation of Z-Clamps

Z-Clamps are installed in much the same manner as Beta Clamps. The weld studs are welded onto existing structure and the clamp assembled onto them.

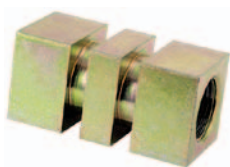


## Installation of Beta Adapter

Beta Adapters are installed in much the same manner as Beta Clamps. The weld plate is welded onto existing structure and the Beta cushion and adapter is assembled onto it.



## Z-CLAMP & BETA ADAPTER OPTIONAL ADAPTERS



FEMALE JUNCTION ADAPTER



O-RING FACE SEAL



37° FLARE MALE JUNCTION ADAPTER



RUBBER SPLIT BUSHINGS

Drill Sizes for NPT Pipe Taps		
Tap Size (In.)	Threads/Inch	Drill Dia. (In.)
1/8	27	R
1/4	18	7/16
3/8	18	37/64
1/2	14	23/32
3/4	14	59/64
1	11 1/2	1 5/32
1 1/4	11 1/2	1 1/2
1 1/2	11 1/2	1 47/64
2	11 1/2	2 7/32
2 1/2	8	2 5/8
3	8	3 1/4
3 1/2	8	3 3/4
4	8	4 1/4

Tap & Drill Sizes (Unified National Coarse)		
Tap Size (In.)	Threads/Inch	Drill Size (In.)
1/4	20	7
5/16	18	F
3/8	16	5/16
7/16	14	U
1/2	13	27/64
9/16	12	31/64
5/8	11	17/32
3/4	10	21/32
7/8	9	49/64
1	8	7/8
1 1/8	7	63/64
1 1/4	7	17/64
1 3/8	6	17/32
1 1/2	6	1 11/32
1 3/4	5	1 9/16
2	4 1/2	1 25/32

Standard Weight Pipe Data					
Nom. Diameter (In.)			Nom. Wt./Ft. (lbs.)	Length Containing One Cu. Ft.	Gallons / Linear Ft. (Gallons)
Pipe	Inside	Outside			
1/8	0.269	0.405	0.245	2,526.000	0.0030
1/4	0.364	0.540	0.425	1,383.800	0.0054
3/8	0.493	0.675	0.568	754.360	0.0099
1/2	0.622	0.840	0.851	473.910	0.0158
3/4	0.824	1.050	1.131	270.030	0.0277
1	1.049	1.315	1.679	166.620	0.0449
1 1/4	1.380	1.660	2.273	96.275	0.0777
1 1/2	1.610	1.900	2.718	70.733	0.1058
2	2.067	2.375	3.653	49.913	0.1743
2 1/2	2.469	2.875	5.793	30.077	0.2487
3	3.068	3.500	7.580	19.479	0.3840
3 1/2	3.548	4.000	9.110	14.565	0.5136
4	4.026	4.500	10.790	11.312	0.6613
5	5.047	5.563	14.620	7.198	1.0393
6	6.065	6.625	18.970	4.984	1.5008
8	7.981	8.625	28.550	2.878	2.5988
10	10.020	10.750	40.480	1.826	4.0963

Copper Tube Data - Type L					
Size (In.)	O.D. (In.)	O.D. (In.)	Wall Thick. (In.)	Weight per Foot (lbs)	Weight of Water / Ft. (lbs)
1/4	3/8	0.375	0.030	0.126	0.034
3/8	1/2	0.500	0.035	0.198	0.062
1/2	5/8	0.625	0.040	0.285	0.100
5/8	3/4	0.750	0.042	0.362	0.151
3/4	7/8	0.875	0.045	0.455	0.209
1	1 1/8	1.125	0.050	0.655	0.357
1 1/4	1 3/8	1.375	0.055	0.884	0.546
1 1/2	1 5/8	1.625	0.060	1.140	0.767
2	2 1/8	2.125	0.070	1.750	1.341
2 1/2	2 5/8	2.625	0.080	2.480	2.064
3	3 1/8	3.125	0.090	3.330	2.949
3 1/2	3 5/8	3.625	0.100	4.290	3.989
4	4 1/8	4.125	0.110	5.380	5.188
5	5 1/8	5.125	0.125	7.610	8.081
6	6 1/8	6.125	0.140	10.200	11.616
8	8 1/8	8.125	0.200	19.290	20.289
10	10 1/8	10.125	0.250	30.100	31.590
12	12 1/8	12.125	0.280	40.400	45.426

Copper Tube Data - Type K					
Size (In.)	O.D. (In.)	O.D. (In.)	Wall Thick. (In.)	Weight per Foot (lbs)	Weight of Water / Ft. (lbs)
1/4	3/8	0.375	0.035	0.145	0.032
3/8	1/2	0.500	0.049	0.269	0.055
1/2	5/8	0.625	0.049	0.344	0.094
5/8	3/4	0.750	0.049	0.418	0.144
3/4	7/8	0.875	0.065	0.641	0.188
1	1 1/8	1.125	0.065	0.839	0.337
1 1/4	1 3/8	1.375	0.065	1.040	0.527
1 1/2	1 5/8	1.625	0.072	1.360	0.743
2	2 1/8	2.125	0.083	2.060	1.310
2 1/2	2 5/8	2.625	0.095	2.920	2.000
3	3 1/8	3.125	0.109	4.000	2.960
3 1/2	3 5/8	3.625	0.120	5.120	3.900
4	4 1/8	4.125	0.134	6.510	5.060
5	5 1/8	5.125	0.160	9.670	8.000
6	6 1/8	6.125	0.192	13.870	11.200
8	8 1/8	8.125	0.271	25.900	19.500
10	10 1/8	10.125	0.338	40.300	30.423
12	12 1/8	12.125	0.405	57.800	43.675

Steel Pipe Data — Schedule No 40 & 80					
Nominal Size (In.)	O.D. (In.)	Schedule No.	Wall Thick. (In.)	Weight per Foot (lbs)	Weight of Water per Foot (lbs)
3/8	0.675	40	0.091	0.567	0.083
		80	0.126	0.738	0.061
1/2	0.840	40	0.109	0.850	0.132
		80	0.147	1.087	0.101
3/4	1.050	40	0.113	1.130	0.230
		80	0.154	1.473	0.186
1	1.315	40	0.133	1.678	0.374
		80	0.179	2.171	0.311
1 1/4	1.660	40	0.140	2.272	0.647
		80	0.191	2.996	0.555
1 1/2	1.900	40	0.145	2.717	0.882
		80	0.200	3.631	0.765
2	2.375	40	0.154	3.652	1.452
		80	0.218	5.022	1.279
2 1/2	2.875	40	0.203	5.790	2.072
		80	0.276	7.660	1.834
3	3.500	40	0.216	7.570	3.200
		80	0.300	10.250	2.860
3 1/2	4.000	40	0.226	9.110	4.280
		80	0.318	12.510	3.850
4	4.500	40	0.237	10.790	5.510
		80	0.337	14.980	4.980
5	5.563	40	0.258	14.620	8.660
		80	0.375	20.780	7.870
6	6.625	40	0.280	18.970	12.510
		80	0.432	28.570	11.290
8	8.625	40	0.322	28.550	21.600
		80	0.500	43.390	19.800
10	10.750	40	0.365	40.480	34.100
		80	0.593	64.400	31.100
12	12.75	40	0.406	53.600	48.500
		80	0.687	88.600	44.000
14	14.000	40	0.437	63.000	58.500
		80	0.750	107.000	51.200
16	16.000	40	0.500	83.000	76.500
		80	0.843	137.000	69.700
18	18.000	40	0.563	105.000	97.200
		80	0.937	171.000	88.500
20	20.000	40	0.593	123.000	120.400
		80	1.031	209.000	109.400

PVC and CPVC Pipes - Schedule 40 (inches)					
Nominal Pipe Size	Outside Diameter	Minimum Wall Thickness	Nominal Inside Diameter	Weight (lb/100 ft)	
				PVC	CPVC
1/2	0.840	0.109	0.622	16	17
3/4	1.050	0.113	0.824	21	23
1	1.315	0.133	1.049	32	34
1 1/4	1.660	0.140	1.380	43	46
1 1/2	1.900	0.145	1.610	51	55
2	2.375	0.154	2.067	68	74
2 1/2	2.875	0.203	2.469	107	118
3	3.500	0.216	3.068	141	154
4	4.500	0.237	4.026	201	220
5	5.563	0.258	5.047	273	-
6	6.625	0.280	6.065	353	386
8	8.625	0.322	7.981	539	581
10	10.750	0.365	10.020	755	824
12	12.750	0.406	11.938	1001	1089
14	14.000	0.438	13.124	1180	-
16	16.000	0.500	15.000	1543	-

PVC and CPVC Pipes - Schedule 80 (inches)					
Nominal Pipe Size	Outside Diameter	Minimum Wall Thickness	Nominal Inside Diameter	Weight (lb/100 ft)	
				PVC	CPVC
1/2	0.840	0.147	0.546	20	22
3/4	1.050	0.154	0.742	27	30
1	1.315	0.179	0.957	41	44
1 1/4	1.660	0.191	1.278	52	61
1 1/2	1.900	0.200	1.500	67	74
2	2.375	0.218	1.939	95	102
2 1/2	2.875	0.276	2.323	145	156
3	3.500	0.300	2.900	194	209
4	4.500	0.337	3.826	275	305
5	5.563	0.375	4.813	387	-
6	6.625	0.432	5.761	542	582
8	8.625	0.500	7.625	805	883
10	10.750	0.593	9.564	1200	1309
12	12.750	0.687	11.376	1650	180
14	14.000	0.750	12.500	1930	-
16	16.000	0.843	14.314	2544	-

PVC - Wall Schedule 40 - Support Spacing (feet)			
NPS (inches)	Operating Temperature (°F)		
	60	100	140
1/2	4 1/2	4	2 1/2
3/4	5	4	2 1/2
1	5 1/2	4 1/2	2 1/2
1 1/4	5 1/2	5	3
1 1/2	6	5	3
2	6	5	3
3	7	6	3 1/2
4	7 1/2	6 1/2	4
6	8 1/2	7 1/2	4 1/2
8	9	8	4 1/2

PVC - Wall Schedule 80 - Support Spacing (feet)			
NPS (inches)	Operating Temperature (°F)		
	60	100	140
1/2	5	4 1/2	2 1/2
3/4	5 1/2	4 1/2	2 1/2
1	6	5	3
1 1/4	6 1/2	5 1/2	3 1/2
1 1/2	7	6	3 1/2
2	8	7	4
3	9	7 1/2	4 1/2
4	10	9	5
6	11	9 1/2	5 1/2
8	9	8	4 1/2

Hydraulic Hose - No Skive SAE 100R1 Type AT				
SAE Number	Hose I.D.		Hose O.D.	
	(in.)	(mm)	(in.)	(mm)
SAE-3	3/16	5.0	0.46	12
SAE-4	1/4	6.3	0.53	13
SAE-5	5/16	8.0	0.59	15
SAE-6	3/8	10.0	0.68	17
SAE-8	1/2	12.5	0.81	21
SAE-10	5/8	16.0	0.94	24
SAE-12	3/4	19.0	1.09	28
SAE-16	1	25.0	1.41	36
SAE-20	1-1/4	31.5	1.79	45
SAE-24	1-1/2	38.0	2.00	51
SAE-32	2	51.0	2.54	64

Hydraulic Hose - No Skive SAE 100R2 Type AT - ISO 1436 Type 2AT - EN 853 Type 2SN				
SAE Number	Hose I.D.		Hose O.D.	
	(in.)	(mm)	(in.)	(mm)
SAE-4	1/4	6.3	0.53	13
SAE-5	5/16	8.0	0.59	15
SAE-6	3/8	10.0	0.68	17
SAE-8	1/2	12.5	0.81	21
SAE-10	5/8	16.0	0.94	24
SAE-12	3/4	19.0	1.09	28
SAE-16	1	25.0	1.41	36
SAE-20	1-1/4	31.5	1.79	45
SAE-24	1-1/2	38.0	2.00	51
SAE-32	2	51.0	2.54	64

Hydraulic Hose - SAE 100R16 Type AT				
SAE Number	Hose I.D.		Hose O.D.	
	(in.)	(mm)	(in.)	(mm)
SAE-4	1/4	6.3	0.53	13
SAE-5	5/16	8.0	0.59	15
SAE-6	3/8	10.0	0.68	17
SAE-8	1/2	12.5	0.81	21
SAE-10	5/8	16.0	0.94	24
SAE-12	3/4	19.0	1.09	28
SAE-16	1	25.0	1.41	36

Hydraulic Hose - No Skive SAE 100R17 Abrasion Resistant "Tough Cover" and "Super Tough" Cover				
SAE Number	Hose I.D.		Hose O.D.	
	(in.)	(mm)	(in.)	(mm)
SAE-4	1/4	6.3	0.53	13
SAE-6	3/8	10.0	0.68	17
SAE-8	1/2	12.5	0.81	21
SAE-10	5/8	16.0	0.94	24
SAE-12	3/4	19.0	1.09	28
SAE-16	1	25.0	1.41	36
SAE-20	1-1/4	31.5	1.79	45

# Fraction Conversion Table

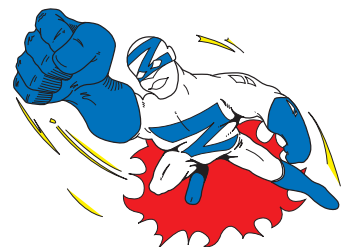


Fractions	Decimal (in)	Metric (mm)
1/64	0.016	0.40
1/32	0.031	0.79
	0.039	1
3/64	0.047	1.19
1/16	0.063	1.59
5/64	0.078	1.98
	0.079	2
3/32	0.094	2.38
7/64	0.109	2.78
	0.118	3
1/8	0.125	3.18
9/64	0.141	3.57
5/32	0.156	3.97
	0.157	4
11/64	0.172	4.37
3/16	0.188	4.76
	0.197	5
13/64	0.203	5.16
7/32	0.219	5.56
15/64	0.234	5.95
	0.236	6
1/4	0.250	6.35
17/64	0.266	6.75
	0.276	7
9/32	0.281	7.14
19/64	0.297	7.54
5/16	0.313	7.94
	0.315	8
21/64	0.328	8.33
11/32	0.344	8.73
	0.354	9
23/64	0.359	9.13
3/8	0.375	9.53
25/64	0.391	9.92
	0.394	10
13/32	0.406	10.32
27/64	0.422	10.72
	0.433	11
7/16	0.438	11.11
29/64	0.453	11.51
15/32	0.469	11.91
	0.472	12
31/64	0.484	12.30
1/2	0.500	12.70
	0.512	13
33/64	0.516	13.10
17/32	0.531	13.49
35/64	0.547	13.89
	0.551	14
9/16	0.563	14.29
37/64	0.578	14.68
	0.591	15
19/32	0.594	15.08
39/64	0.609	15.48
5/8	0.625	15.88
	0.630	16
41/64	0.641	16.27
21/32	0.656	16.67
	0.669	17
43/64	0.672	17.07
11/16	0.688	17.46
45/64	0.703	17.86
	0.709	18
23/32	0.719	18.26
47/64	0.734	18.65
	0.748	19
3/4	0.750	19.05
49/64	0.766	19.45
25/32	0.781	19.84

Fractions	Decimal (in)	Metric (mm)
	0.787	20
51/64	0.797	20.24
13/16	0.813	20.64
53/64	0.828	21.03
27/32	0.844	21.43
55/64	0.859	21.83
7/8	0.875	22.23
57/64	0.891	22.62
29/32	0.906	23
59/64	0.922	23.42
15/16	0.938	23.81
61/64	0.953	24.21
31/32	0.969	24.61
63/64	0.984	25
1	1	25.40
1 1/32	1.031	26.19
1 1/16	1.063	26.99
1 3/32	1.094	27.78
1 1/8	1.125	28.58
1 5/32	1.156	29.37
	1.181	30
1 3/16	1.188	30.16
1 7/32	1.219	30.96
1 1/4	1.250	31.75
1 9/32	1.281	32.54
1 5/16	1.313	33.34
1 11/32	1.344	34.13
1 3/8	1.375	34.93
	1.378	35
1 13/32	1.406	35.72
1 7/16	1.438	36.51
1 15/32	1.469	37.31
1 1/2	1.500	38.10
1 17/32	1.531	38.89
1 9/16	1.563	39.69
	1.575	40
1 19/32	1.594	40.48
1 5/8	1.625	41.28
1 21/32	1.656	42.07
1 11/16	1.688	42.86
1 23/32	1.719	43.66
1 3/4	1.750	44.45
	1.772	45
1 25/32	1.781	45.24
1 13/16	1.813	46.04
1 27/32	1.844	46.83
1 7/8	1.875	47.63
1 29/32	1.906	48.42
1 15/16	1.938	49.21
	1.969	50
1 31/32	1.969	50.01
2	2	50.80
2 1/32	2.031	51.59
2 1/16	2.063	52.39
2 3/32	2.094	53.18
2 1/8	2.125	53.98
2 5/32	2.156	54.77
	2.165	55
2 3/16	2.188	55.56
2 7/32	2.219	56.36
2 1/4	2.250	57.15
2 9/32	2.281	57.94
2 5/16	2.313	58.74
2 11/32	2.344	59.53
	2.362	60
2 3/8	2.375	60.33
2 13/32	2.406	61.12
2 7/16	2.438	61.91
2 15/32	2.469	62.71

Fractions	Decimal (in)	Metric (mm)
2 1/2	2.500	63.50
2 17/32	2.531	64.29
	2.559	65
2 9/16	2.563	65.09
2 19/32	2.594	65.88
2 5/8	2.625	66.68
2 21/32	2.656	67.47
2 11/16	2.688	68.26
2 23/32	2.719	69.06
2 3/4	2.750	69.85
	2.756	70
2 25/32	2.781	70.64
2 13/16	2.813	71.44
2 27/32	2.844	72.23
2 7/8	2.875	73.03
2 29/32	2.906	73.82
2 15/16	2.938	74.61
	2.953	75
2 31/32	2.969	75.41
3	3	76.20
3 1/32	3.031	76.99
3 1/16	3.063	77.79
3 3/32	3.094	78.58
3 1/8	3.125	79.38
	3.150	80
3 5/32	3.156	80.17
3 3/16	3.188	80.96
3 7/32	3.219	81.76
3 1/4	3.250	82.55
3 9/32	3.281	83.34
3 5/16	3.313	84.14
3 11/32	3.344	84.93
	3.346	85
3 3/8	3.375	85.73
3 13/32	3.406	86.52
3 7/16	3.438	87.31
3 15/32	3.469	88.11
3 1/2	3.500	88.90
3 17/32	3.531	89.69
	3.543	90
3 9/16	3.563	90.49
3 19/32	3.594	91.28
3 5/8	3.625	92.08
3 21/32	3.656	92.87
3 11/16	3.688	93.66
3 23/32	3.719	94.46
	3.740	95
3 3/4	3.750	95.25
3 25/32	3.781	96.04
3 13/16	3.813	96.84
3 27/32	3.844	97.63
3 7/8	3.875	98.43
3 29/32	3.906	99.22
	3.937	100
3 15/16	3.938	100.01
3 31/32	3.969	100.81
4	4	101.60
4 1/16	4.063	103.19
4 1/8	4.125	104.78
4 3/16	4.188	106.36
4 1/4	4.250	107.95
4 5/16	4.313	109.54
	4.331	110
4 3/8	4.375	111.13
4 7/16	4.438	112.71
4 1/2	4.500	114.30
4 9/16	4.563	115.89
4 5/8	4.625	117.48
4 11/16	4.688	119.06

Fractions	Decimal (in)	Metric (mm)
	4.724	120
4 3/4	4.750	120.65
4 13/16	4.813	122.24
4 7/8	4.875	123.83
4 15/16	4.938	125.41
5	5	127.00
	5.118	130
5 1/4	5.250	133.35
5 1/2	5.500	139.70
	5.512	140
5 3/4	5.750	146.05
	5.906	150
6	6	152.40
6 1/4	6.250	158.75
	6.299	160
6 1/2	6.500	165.10
	6.693	170
6 3/4	6.750	171.45
7	7	177.80
	7.087	180
	7.480	190
7 1/2	7.500	190.50
	7.874	200
8	8	203.20
8 1/2	8.500	215.90
9	9	228.60
9 1/2	9.500	241.30
	9.843	250
10	10	254.00
11	11	279.40
	11.811	300
12	12	304.80
13	13	330.20
	13.780	350
14	14	355.60
15	15	381.00
	15.748	400
16	16	406.40
17	17	431.80
	17.717	450
18	18	457.20
19	19	482.60
	19.685	500
20	20	508.00





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