



**ZSI-Foster**

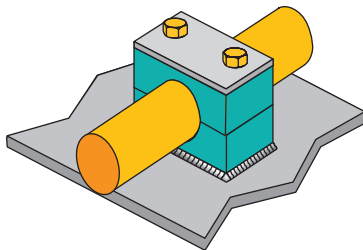


# BETA

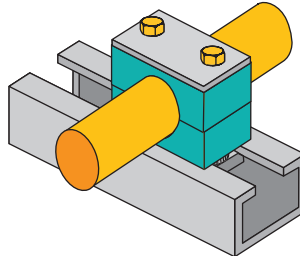
## Hydraulic Clamps™



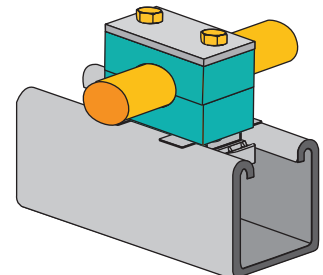
***Installation Options For All Your Application Needs!***



**Weld Mounted**



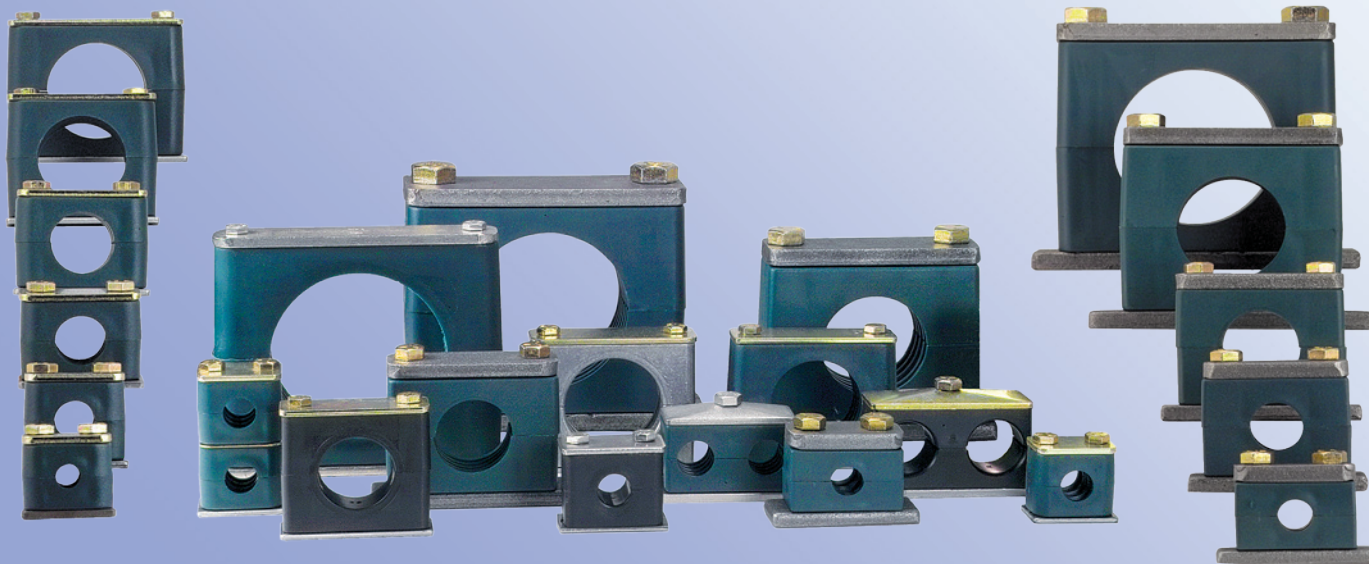
**Din Rail Mounted**



**Z-Strut Channel Mounted**



## Beta Hydraulic Clamps™



**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

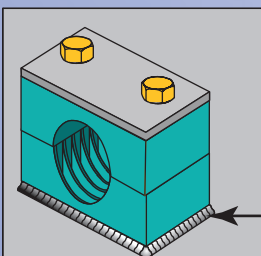
- Standard – Polypropylene (Green Color)  
-22°F to 194°F (-30°C to +90°C)
- Aluminum is available for use in high heat applications

**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.

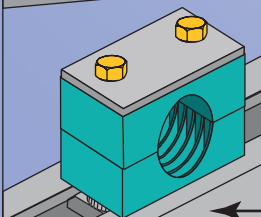
**ZSi offers an installation option for all of your application needs.**

### COMMON WELDED METHOD



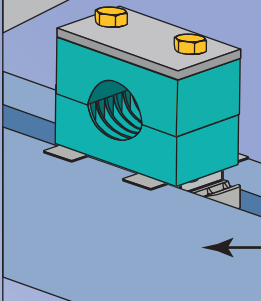
Install by welding the weld plate to existing steel

### DIN RAIL MOUNTED



Attach to C-Rail using ZSi C-Rail Nuts

### Z-STRUT MOUNTED

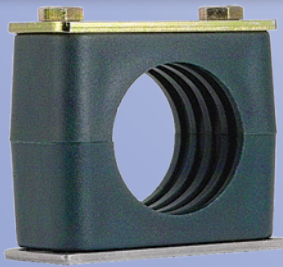


Attach to Z-Strut Channel using our exclusive Z-Strut Channel Adapter Nut

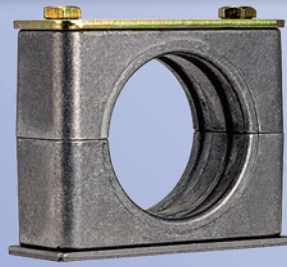




# Beta Hydraulic Clamps™



Steel w/ Polypropylene Cushion

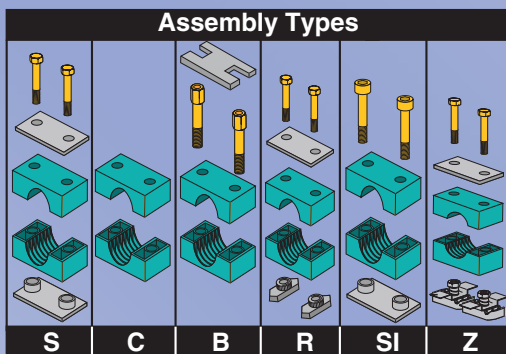


Steel w/ Aluminum Cushion

## 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°.

**INSTALLATION** - Refer to pages 9 – 11 for complete installation guide.

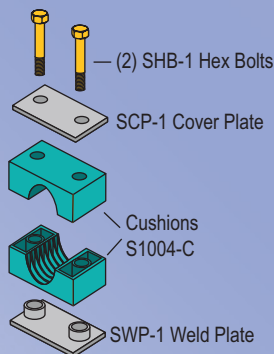


### ORDERING EXAMPLE

S1004-S

### ASSEMBLY INCLUDES

Quantity	Part No.	Description
1 Each	<b>SWP1</b>	Weld Plate
1 Each	<b>SCP1</b>	Cover Plate
2 Each	<b>SHB1</b>	Hex Bolts
1 set	<b>S1004C</b>	Cushions



Group	Part No. *	Tube Size	Pipe Size	Metric Size	Bolt
S1	<b>S1004</b>	1/4" (0.250)	—	—	1/4"-20 x 1 1/4"
	<b>S1006</b>	3/8" (0.375)	—	—	
	<b>SM1006</b>	—	—	6mm	
	<b>S1007</b>	—	1/8" (0.405)	—	
	<b>SM1008</b>	—	—	8mm	
	<b>SM1012</b>	—	—	12mm	
S2	<b>S2008</b>	1/2" (0.500)	—	—	1/4"-20 x 1 3/8"
	<b>S2009</b>	—	1/4" (0.540)	—	
	<b>S2010</b>	5/8" (0.625)	—	—	
	<b>S2011</b>	—	3/8" (0.675)	—	
	<b>SM2014</b>	—	—	14mm	
	<b>SM2015</b>	—	—	15mm	
	<b>SM2018</b>	—	—	18mm	
S3	<b>S3012</b>	3/4" (0.750)	—	—	1/4"-20 x 1 1/2"
	<b>S3014</b>	—	1/2" (0.840)	—	
	<b>S3015</b>	7/8" (0.875)	—	—	
	<b>S3016</b>	1" (1.000)	—	—	
	<b>SM3020</b>	—	—	20mm	
	<b>SM3025</b>	—	—	25mm	
S4	<b>S4017</b>	—	3/4" (1.050)	—	1/4"-20 x 1 3/4"
	<b>S4018</b>	1 1/8" (1.125)	—	—	
	<b>SM4030</b>	—	—	30mm	
S5	<b>S5020</b>	1 1/4" (1.250)	—	—	1/4"-20 x 2 1/2"
	<b>S5021</b>	—	1" (1.315)	—	
	<b>S5024</b>	1 1/2" (1.500)	—	—	
	<b>S5027</b>	—	1 1/4" (1.660)	—	
	<b>SM5035</b>	—	—	35mm	
S6	<b>S6028</b>	1 3/4" (1.750)	—	—	1/4"-20 x 2 3/4"
	<b>S6030</b>	—	1 1/2" (1.900)	—	
	<b>S6032</b>	2" (2.000)	—	—	
S7	<b>S7038</b>	—	2" (2.375)	—	1/4"-20 x 4"
	<b>S7036</b>	2 1/4" (2.250)	—	—	
	<b>S7040</b>	2 1/2" (2.500)	—	—	
	<b>S7044</b>	2 3/4" (2.750)	—	—	
	<b>S7048</b>	3" (3.000)	—	—	



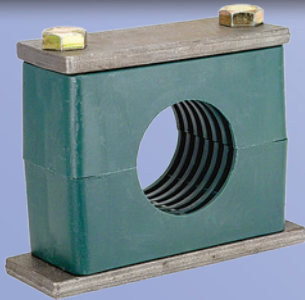
\* For additional sizes contact factory.  
Note: Add assembly type to part number.  
Example: **S1004S-SS** provides the complete assembly as shown with stainless steel components.  
NOTE: SM (metric) only available in Steel with Polypropylene (green) cushion.

	Components	Cushion	Example
none	Steel	Polypropylene (green)	<b>S1004S</b>
-AL	Steel	Aluminum	<b>S1004S-AL</b>
-SS	Stainless Steel	Polypropylene (green)	<b>S1004S-SS</b>

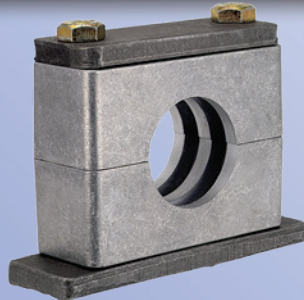
STANDARD SERIES COVER PLATE		STANDARD SERIES SAFETY PLATE		STANDARD SERIES WELD PLATE		HEX BOLT (Two required per assembly)		STACKING BOLTS (Two required per assembly)	
	<b>SCP1 Thru SCP7</b>		<b>SP1 Thru SP-6</b>		<b>SWP1 Thru SWP7</b>		<b>SHB1 Thru SHB7</b>		<b>SB1 Thru SB6</b>
STANDARD SERIES CAP SCREW (Two required per assembly)		C-RAIL NUT (Two required per assembly)		C-RAIL		STRUT NUT For Connection to Z-Strut		Z-STRUT CHANNEL	
	<b>SC-1 Thru SC-6</b>		<b>SRN1-6</b>		<b>SCR1 SCR2</b>		<b>ZSA1-8 (Two required per assembly)</b>		<b>Z1625 Z8125 Z1000 Z875</b>



# Beta Hydraulic Clamps™



Steel w/Polypropylene Cushion

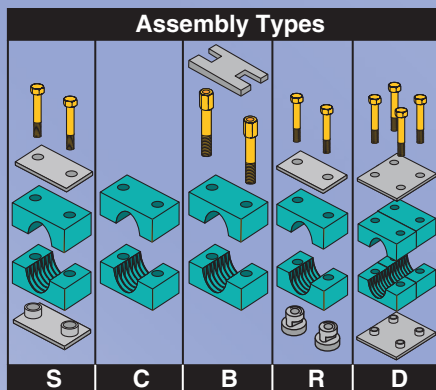


Steel w/Aluminum Cushion

## 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°.

**INSTALLATION** - Refer to pages 9 – 11 for complete installation guide.

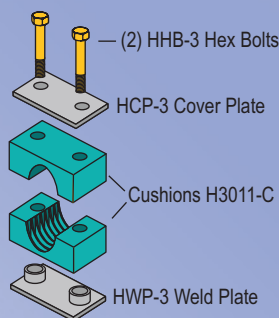


### ORDERING EXAMPLE

**H3004S**

### ASSEMBLY INCLUDES

Quantity	Part No.	Description
1 Each	<b>HWP3</b>	Weld Plate
1 Each	<b>HCP3</b>	Cover Plate
2 Each	<b>HHB3</b>	Hex Bolts
1 set	<b>H3011C</b>	Cushions



Group	Part No.	Tube Size	Pipe Size	Wt/ 100	Hex Bolt
H3	H3004	1/4" (0.250)	—	65	3/8"-16 x 1-3/4"
	H3006	3/8" (0.375)	—	65	
	H3007	—	1/8" (0.405)	65	
	H3008	1/2" (0.500)	—	65	
	H3009	—	1/4" (0.540)	65	
	H3010	5/8" (0.625)	—	65	
	H3011	—	3/8" (0.675)	65	
H4	H4012	3/4" (0.750)	—	83	3/8"-16 x 2-1/4"
	H4014	—	1/2" (0.840)	82	
	H4015	7/8" (0.875)	—	83	
	H4016	1" (1.000)	—	83	
	H4017	—	3/4" (1.050)	83	
H5	H5020	1 1/4" (1.250)	—	104	3/8"-16 x 2-3/4"
	H5021	—	1" (1.315)	104	
	H5024	1 1/2" (1.500)	—	103	
	H5027	—	1 1/4" (1.660)	103	
H6	H6028	1 3/4" (1.750)	—	266	1/2"-13 x 4"
	H6030	—	1 1/2" (1.900)	276	
	H6032	2" (2.000)	—	267	
	H6034	2 1/4" (2.250)	—	266	
	H6038	2 3/8" (2.375)	2" (2.375)	267	
	H6040	2 1/2" (2.500)	—	264	
H7	H7044	2 3/4" (2.750)	—	510	5/8"-11 x 5-1/4"
	H7046	—	2 1/2" (2.870)	525	
	H7050	3" (3.000)	—	506	
	H7056	—	3" (3.500)	495	
	H7057	3 1/2" (3.500)	—	510	
H8	H8072	—	4" (4.500)	1,350	3/4"-10 x 7-1/2"
H9	H9089	—	5" (5.563)	1,970	7/8"-9 x 8-1/4"
	H9106	—	6" (6.625)	1,970	
H10	H10137	—	8" (8.625)	4,700	M30 x 300mm
H11	H11170	—	10" (10.750)	11,500	M30 x 450mm

\*For additional sizes contact factory.

Note: Add assembly type to part number.

Example: **H3004S-SS** provides the complete assembly as shown with stainless steel components.



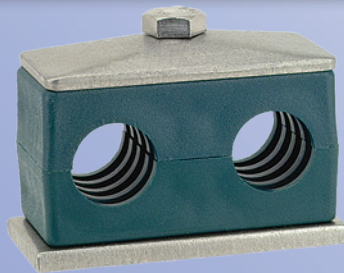
**SUFFIX**

Components	Cushion	Example (complete assembly):
<b>NONE</b> Steel	Polypropylene (green)	<b>H3004S</b>
<b>-AL</b> Steel	Aluminum	<b>H3004S-AL</b>
<b>-SS</b> Stainless Steel	Polypropylene (green)	<b>H3004S-SS</b>

HEAVY SERIES COVER PLATE		HEAVY SERIES SAFETY PLATE		HEAVY SERIES WELD PLATE		HEAVY SERIES HEX BOLT (Two required per single assembly)		HEAVY SERIES STACKING BOLTS (Two required per single assembly)	
	<b>HCP3 Thru HCP9</b>		<b>HSP3 Thru HSP9</b>		<b>HWP3 Thru HWP9</b>		<b>HHB3 Thru HHB9</b>		<b>HSB3 Thru HSB9</b>
C-RAIL NUT (Two required per single assembly)		C-RAIL		HEAVY SERIES DOUBLE WELD PLATE		HEAVY SERIES DOUBLE COVER PLATE			
	<b>HRN-3-5 HRN6</b>		<b>HCR-1 HCR-2</b>		<b>HDP3 Thru HDP7</b>		<b>DCP3 Thru DCP7</b>		



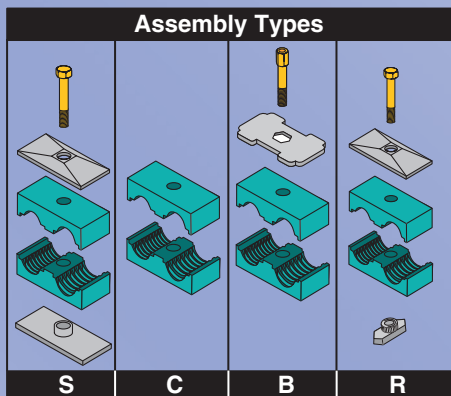
# Beta Hydraulic Clamps™



**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 material

**INSTALLATION** - Refer to pages 9 – 11 for complete installation guide.

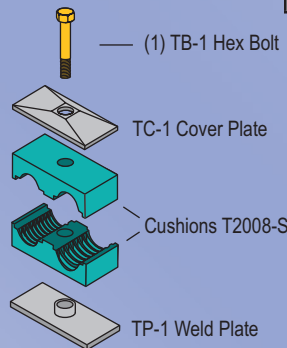


Group	Steel Part No.	Stainless Steel Part No.	Tube Size	Pipe Size	WT/100	Hex Bolt
T1	T1004	T1004-SS	1/4"		21	1/4"-20 x 1 3/8"
	T1006	T1006-SS	3/8"		21	
	T1007	T1007-SS		1/8"	21	
T2	T2008	T2008-SS	1/2"		31	5/16"-18 x 1 3/8"
	T2009	T2009-SS		1/4"	31	
	T2010	T2010-SS	5/8"		31	
	T2011	T2011-SS		3/8"	31	
T3	T3012	T3012-SS	3/4"		40	5/16"-18 x 1 3/4"
	T3014	T3014-SS		1/2"	39	
	T3015	T3015-SS	7/8"		39	
	T3016	T3016-SS	1"		38	
T4	T4017	T4017-SS		3/4"	49	5/16"-18 x 2"
	T4018	T4018-SS	1 1/8"		49	
T5	T5020	T5020-SS	1 1/4"		65	5/16"-18 x 2 3/8"
	T5021	T5021-SS		1	65	
	T5024	T5024-SS	1 1/2"		64	
	T5027	T5027-SS		1 1/4"	62	

\*For additional sizes and stainless steel contact factory.

Note: Add Assembly type to Part No. - Example: **T1004S** provides the complete assembly as shown

ORDERING EXAMPLE		
T2008S		
ASSEMBLY INCLUDES		
Quantity	Part No.	Description
1 Each	TP1	Weld Plate
1 Each	TC1	Cover Plate
1 Each	TB1	Hex Bolts
1 set	T2008S	Cushions

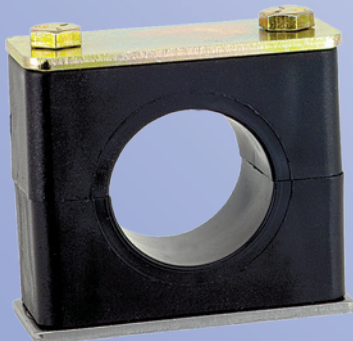


TWIN SERIES COVER PLATE		TWIN SERIES SAFETY PLATE		TWIN SERIES WELD PLATE		TWIN STACKING BOLTS	
	TC1 Thru TC5		TSP1 Thru TSP5		TP1 Thru TP5		TSB1 Thru TSB5
TWIN HEX BOLT		C-RAIL NUT		C-RAIL			
	TB1 Thru TB5		SRN1-6 TRN2-5		SCR1 SCR2		



# Beta Hydraulic Clamps™

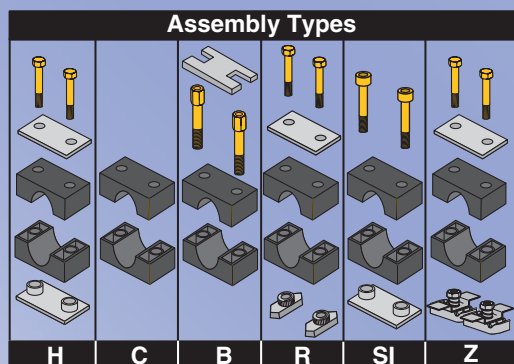
## BETA "SMOOTHIE" STANDARD SERIES



**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 9 – 11 for complete installation guide.

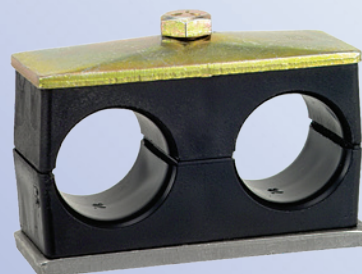


Group	Part No.	SAE 100R1 Hose Size	WT/100	Bolt
S2	<b>S2004H</b>	1/4"	20	1/4 – 20 x 1 3/8
	<b>S2006H</b>	3/8"	20	
S3	<b>S3008H</b>	1/2"	25	1/4 – 20 x 1 1/2
	<b>S3010H</b>	5/8"	25	
S4	<b>S4012H</b>	3/4"	29	1/4 – 20 x 1 3/4
S5	<b>S5016H</b>	1"	39	1/4 – 20 x 2 1/2

\*For additional sizes and stainless steel contact factory.

Note: Add Assembly type to Part No. - **Example: S2004H** provides the complete assembly as shown

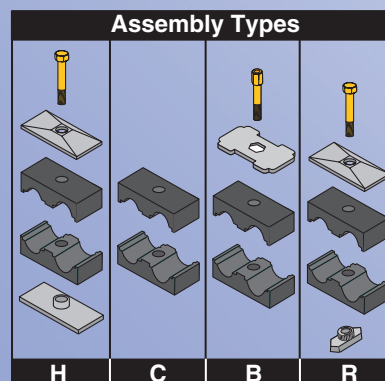
## BETA "SMOOTHIE" TWIN SERIES



**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 9 – 11 for complete installation guide.



Group	Part No.	SAE 100R1 Hose Size	WT/100	Bolt
T2	<b>T2004H</b>	1/4"	31	5/16 – 18 x 1 3/8
	<b>T2006H</b>	3/8"	31	
T3	<b>T3008H</b>	1/2"	39	5/16 – 18 x 1 3/4
T4	<b>T4010H</b>	5/8"	49	5/16 – 18 x 2
	<b>T4012H</b>	3/4"	49	
T5	<b>T5016H</b>	1"	65	5/16 – 18 x 2 3/8

\*For additional sizes and stainless steel contact factory.

Note: Add Assembly type to Part No. - **Example: T2004H** provides the complete assembly as shown





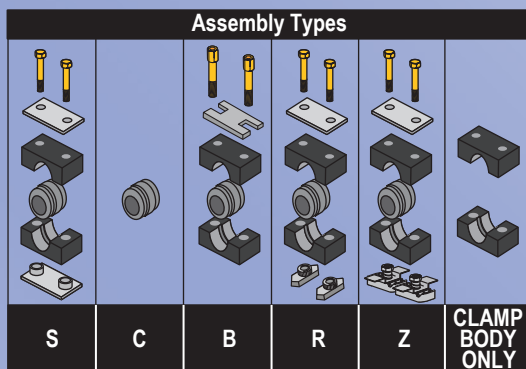
# Beta Hydraulic Clamps™

## BETA STANDARD RUBBER INSERT SERIES



- 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 9 – 11 for complete installation guide.

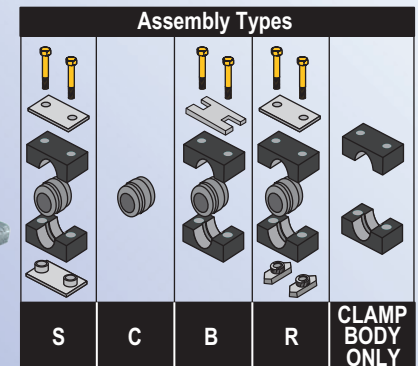
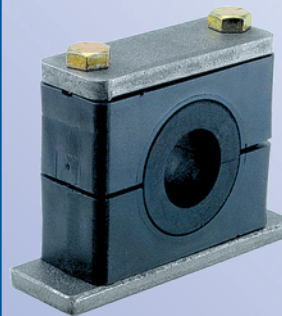


Group	Part No.	EE-Rubber Insert Bore Size Ø D		Tube O.D.	Pipe	Recommended Nominal Size Hose O.D. Min - Max	Bolt Size
		in	mm				
S4	SM4006RI	0.24	6	-	-	0.22 - 0.24	1/4-20 x1 3/4
	SM4008RI	0.32	8	1/16"	-	0.30 - 0.32	
	S4007RI	0.39	10	-	1/8"	0.37 - 0.39	
	SM4012RI	0.47	12	-	-	0.45 - 0.47	
	S4008RI	0.50	12.7	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	17.2	-	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	1/4-20 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	26.9	-	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 HEAVY RUBBER INSERT SERIES



- 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 9 – 11 for complete installation guide.

Group	Part No.	Bore Ø D in. (mm)	Tube O.D.	Pipe Size	Nom. Size Hose O.D	Bolt Size
H4	HM4006RI	0.24 (6)	-	-	0.22 - 0.24	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	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	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	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	HM8036RI	3.27 (83)	-	-	3.19 - 3.27	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.



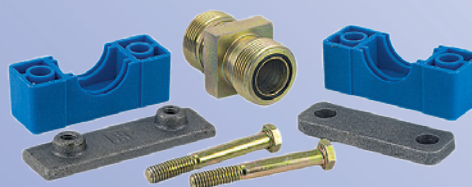
# Beta Hydraulic Clamps™





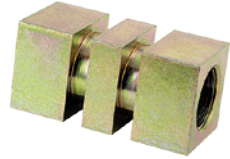


The **BETA-ADAPTER** allows a clamping junction to be inserted into virtually any hydraulic line. The exclusive square bodied junction adapter design can be used with metallic tubing or hydraulic hose ends. It provides a point of union for hydraulic runs which transition from one form of conveyance to 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 pages 9 – 11 for complete installation guide.



## BETA ADAPTER – OPTIONAL ADAPTERS (FOR USE WITH BETA ADAPTERS & Z-CLAMPS)

		Tube Size	Group 1 (H4) Part No.	Group 2 (H5) Part No.
	37° JIC	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
	O-Ring Face Seal	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
	Female Junction	1"	–	H5MJO2-16-S
		1/2"	H4FJA1-8-S	–
	Female Pipe	3/4"	–	H5FJA2-12-S
	Beta Cushions Only (Set of Two)	3/8" NPT	H4FJA1-6P-S	H5FJA2-12P-S
		–	H4JCN-C	H5JCN-C
	Z-Clamp Split Bushing	–	HAC-1 (1-1/2" SERIES) CAN BE USED	HAC-2 (2" SERIES) CAN BE USED





# Beta Hydraulic Clamps™

## BETA CLAMPS TORQUE AND MATERIAL PROPERTIES

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.

### 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.		

### DRILL SIZES FOR NPT PIPE TAPS

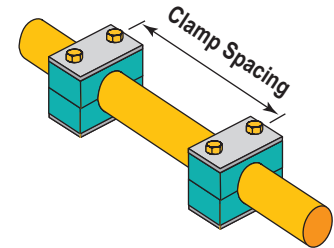
Tap Size (In.)	Threads/In.	Drill Dia. (In.)
1/8	27	R
1/4	18	7/16
3/8	18	37/64
1/2	14	23/32
3/4	14	59/64
1	11 1/2	1 5/32
1 1/4	11 1/2	1 1/2
1 1/2	11 1/2	1 47/64
2	11 1/2	2 7/32
2 1/2	8	2 5/8
3	8	3 1/4
3 1/2	8	3 3/4
4	8	4 1/4

### TAP & DRILL SIZES (Unified National Coarse)

Tap Size (In.)	Threads/In.	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	1 7/64
1 3/8	6	1 7/32
1 1/2	6	1 11/32
1 3/4	5	1 9/16
2	4 1/2	1 25/32

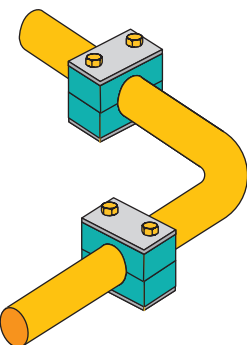
## RECOMMENDED PIPE CLAMP SPACING

### 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.



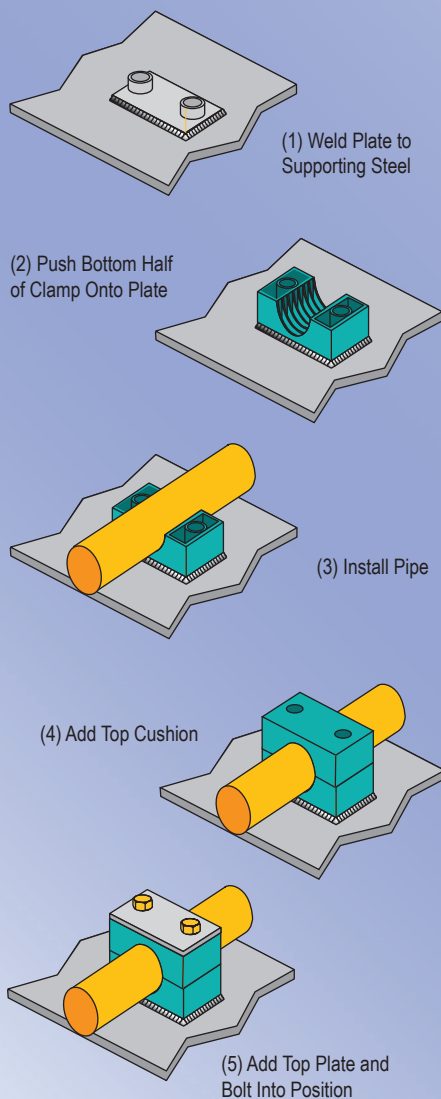
# Beta Hydraulic Clamps™

## 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 Weld Plates

- Weld metal welding plates to a weight adjusted base.
- Clip lower half of clamp on to welding plate and insert tube; then add second clamp-half, cover plate, and tighten with screws provided.
- DO NOT weld with plastic clamp in position.
- After assembly the two clamp halves MUST NOT come into contact with each other.

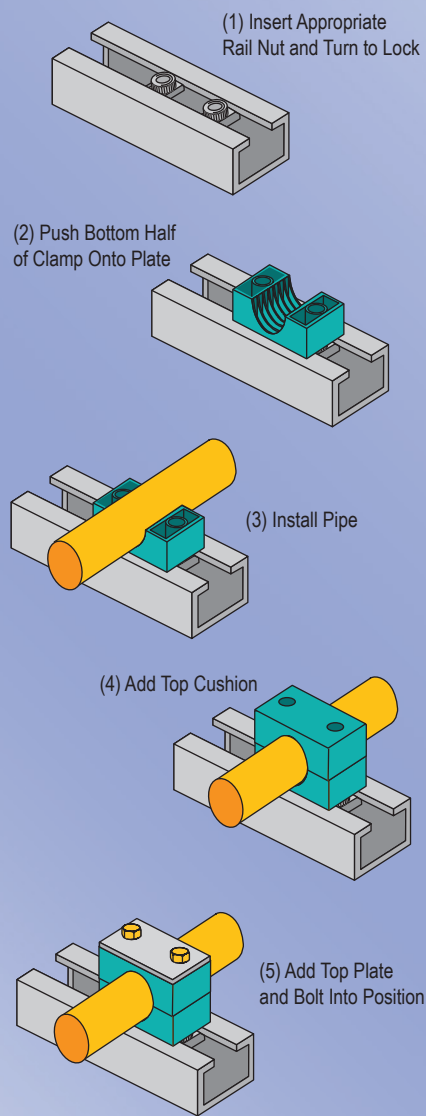
## INSTALLATION ON MOUNTING RAILS

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.

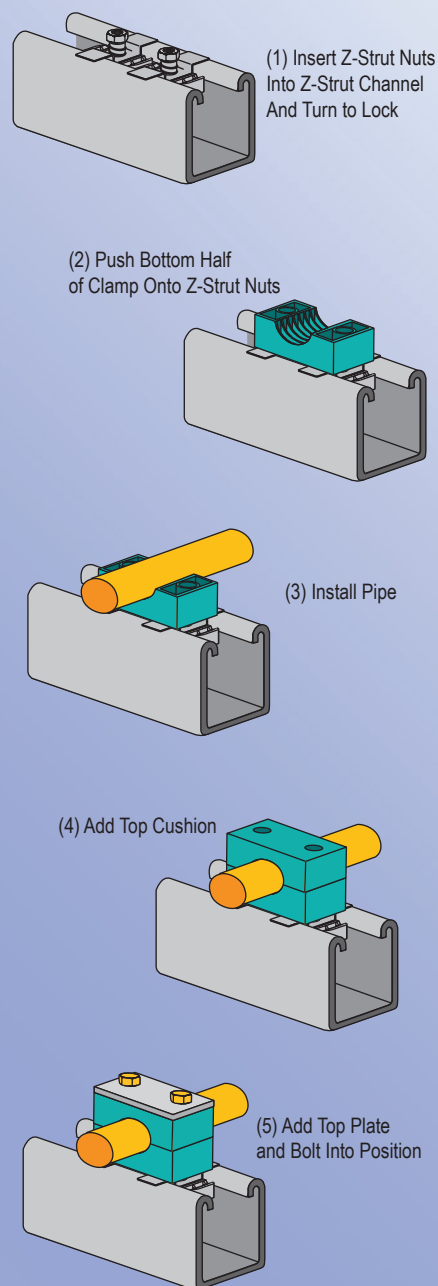


**NOTE:** The rail nut will slide within the rail so clamp units can be adjusted before being firmly bolted.

## 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



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



# Beta Hydraulic Clamps™

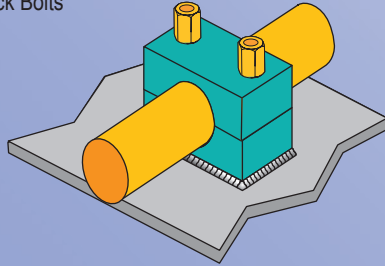
## MULTI-LEVEL ASSEMBLY

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

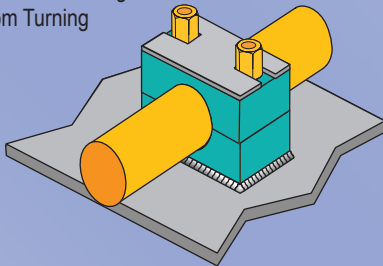
Safety plates are inserted between the clamps to prevent the stacking bolts from turning.

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.

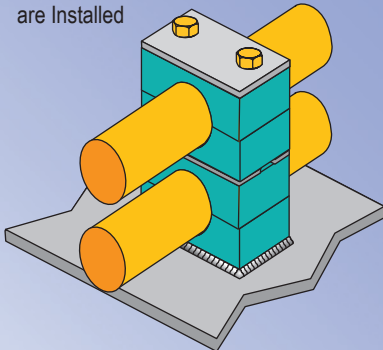
(1) After the Top Cushion is Added, Secure it with the Stack Bolts



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



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



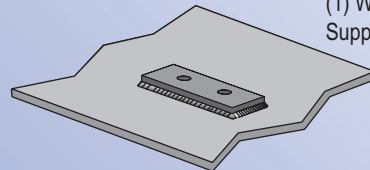
## Stacking Assembly

- Weld on welding plate with a fixing bracket.
- Wedge on lower clamp-half, insert tube, add upper clamp-half and tighten with fixing screws.
- Apply a locking plate to upper half of the clamp to prevent fixing screw from twisting.
- Mount the second tube clamp in exactly the same way.

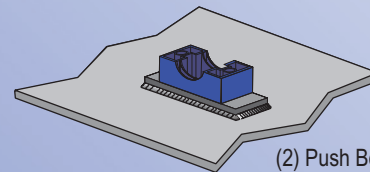
## INSTALLATION OF BETA ADAPTER

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.

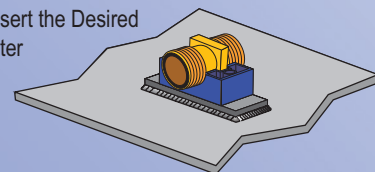
(1) Weld Plate to Supporting Steel



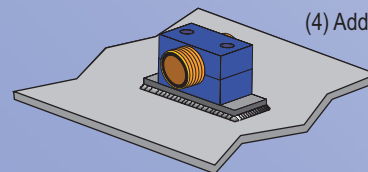
(2) Push Bottom Half of Clamp Onto Plate



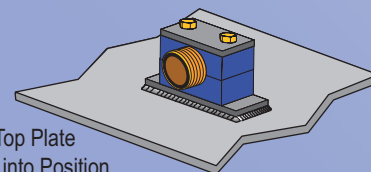
(3) Insert the Desired Adapter



(4) Add Top Cushion



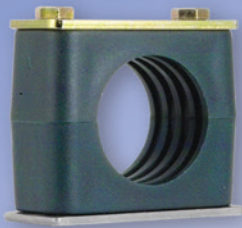
(5) Add Top Plate and Bolt into Position





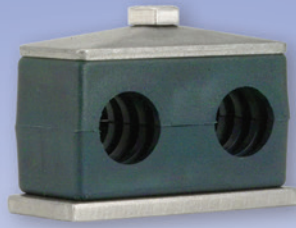


# Beta Hydraulic Clamps™



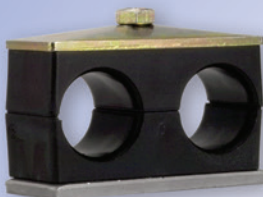
## Beta Standard Series

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



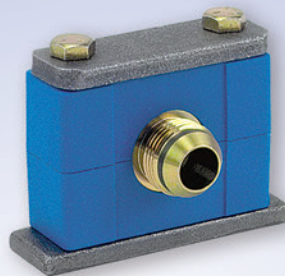
## Beta Twin Series

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



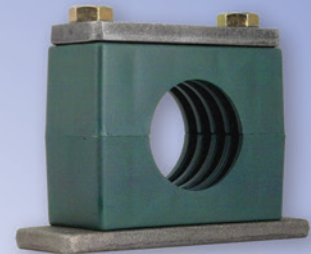
## Beta Twin "Smoothie" Series

- 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 and steel components



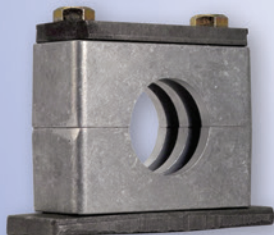
## Beta Adapter Series

- 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



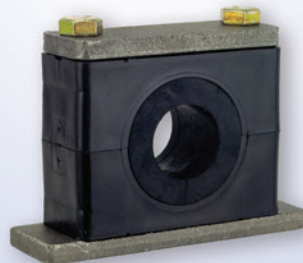
## Beta Heavy Series

- 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



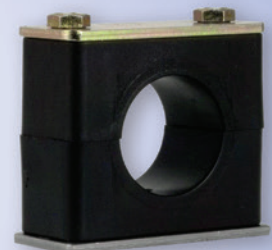
## Beta Special Metals Series

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



## Beta Rubber Inserts Series

- 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 Standard "Smoothie" Series

- 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

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