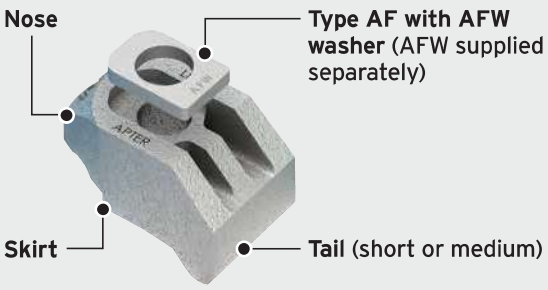
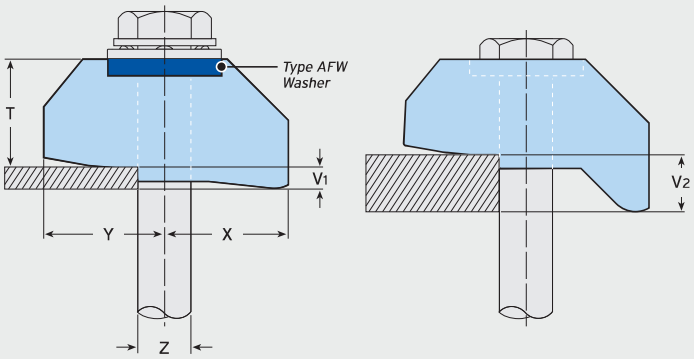
Type AF (data for applications requiring ICC approval)

Lindapter's Girder Clamp is approved for use in all Seismic Design Categories (A through F) and is the only structural steel clamping system compliant with the International Building Code. Extracts of ICC Evaluation Service Report ESR-3976 can be found below, visit www.Lindapter.com to view the full report.

ICC ES ESR-3976 | Evaluated for fatigue resistance per ICC-ES ESR-3976

Code Compliance	✔IBC	✔IRC
✔CBC	✔CRC	✔LABC	✔LARC





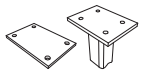
Material: SG iron, hot dip galvanized.

DIMENSION DATA

Product Code	Bolt Size Z	Tail Length short V1	Tail Length medium V2	Y	X	T	Width
LAF050	1/2"	3/16"	1/2"	1 1/8"	1 1/16"	7/8"	1 9/16"
LAF062	5/8"	5/16"	9/16"	1 3/8"	1 1/2"	1 1/16"	1 15/16"
LAF075	3/4"	3/8"	11/16"	1 9/16"	1 9/16"	1 1/4"	2 3/16"
LAF100	1"	9/16"	1 1/8"	1 7/8"	2 3/8"	1 5/8"	3 1/4"



Packing pieces are available to increase the clamping range, please see page 22.

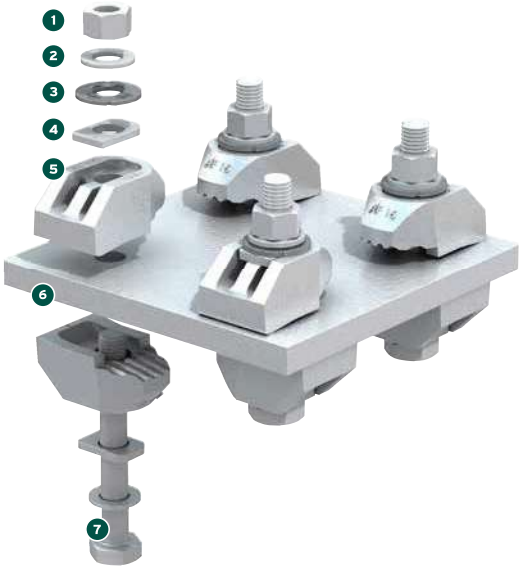


For Type AF Location Plate and End Plate details, please see page 23.

ICC-ES Girder Clamp Components

The following components must be used for Type AF ICC-ES approved connections:

1. **Hexagon Nut** to A563 Grade DH
2. **Standard Hardened Washer** to ASTM F436
3. **DTI Washer** to ASTM F959 (Required for A325 / A490 bolts per ICC, see page 80)
4. **Type AFW Washer** (see page 22)
5. **Type AF**
6. **Location Plate or End Plate** (see page 23)
7. **Standard ASTM F3125 A325 / A490 Hexagon Bolt** If using a Tension Control Bolt (ASTM F1852/F2280), DTI washer is not required.



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Type AF (data for applications requiring ICC approval)

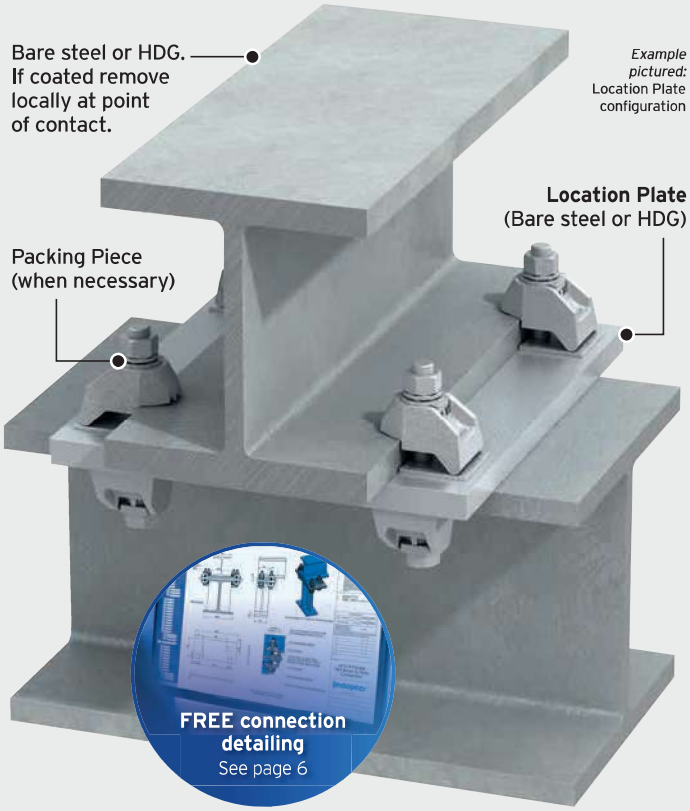
The data below is for use by Engineers designing a connection as per AISC 360, AISC 341 and ASCE / SEI 7 as referenced by the locally adopted building code. To comply with ICC-ES please also refer to Evaluation Report ESR-3976 and the Special Inspection Document which can be found on our website.

The Girder Clamp is approved for use in all Seismic Design Categories (SDC) A through F and can be configured with either a Location Plate (as shown in this example) or an End Plate.

Design strengths are based on a four-bolt assembly and the correct data should be used for the required application. In this example, the LRFD design strength for an application in SDC F is shown.

Connection Example

Bolt Size	1"
Bolt Grade	A490
Design Method	LRFD
Seismic Design Category	F
Tensile Design Strength of Assembly	116,000 lbs
Slip Design Strength of Assembly	18,100 lbs



LRFD design strength & ASD allowable strength

LRFD & ASD strengths (taken from ESR-3976) are to be used when designing a connection per AISC 360, AISC 341 and ASCE/ SEI 7 as referenced by the locally adopted building code. For combined loading refer to Interaction Equation below this table.

Product Code	Bolt Size	Bolt Grade	Static				Seismic Design Category A, B and C				Seismic Design Category D, E and F			
			LRFD Design Strength		ASD Allowable Strength		LRFD Design Strength		ASD Allowable Strength		LRFD Design Strength		ASD Allowable Strength	
			Tension /4 bolts lbs	Slip /4 bolts lbs	Tension /4 bolts lbs	Slip /4 bolts lbs	Tension /4 bolts lbs	Slip /4 bolts lbs	Tension /4 bolts lbs	Slip /4 bolts lbs	Tension /4 bolts lbs	Slip /4 bolts lbs	Tension /4 bolts lbs	Slip /4 bolts lbs
LAF050	1/2"	A325	24100	2700	15000	1690	19500	2700	12200	1690	18200	2120	11400	1330
LAF062	5/8"	A325	36400	5400	22800	3490	30200	5400	18900	3490	27200	4250	17000	2660
LAF075	3/4"	A325	61200	8140	38300	5080	44600	8140	27900	5080	40600	8140	25400	5080
LAF100	1"	A325	103000	12700	64500	7960	86700	12700	54300	7960	80300	11700	50300	7310
LAF062	5/8"	A490	39700	6300	24800	3930	37200	6300	23300	3930	35600	5670	22300	3450
LAF075	3/4"	A490	67400	13300	42100	8300	52600	13300	32900	8300	50800	11300	31800	7080
LAF100	1"	A490	137000	18100	85700	11300	119000	18100	74400	11300	116000	18100	72800	11300

Notes: • A girder clamp connection includes multiples of two, typically four, replicate girder clamp assemblies.
• Slip loads are calculated based on bare or galvanized steel. If using painted steel the coating must be removed at the point of contact to comply with ICC-ES ESR-3976.
• Limited availability of Grade A490 bolts - please check availability before specifying.

Refer to ESR-3976 and Lindapter's Special Inspection Document for details of connection design, installation and conditions of use.

For fatigue resistance please refer to ESR 3976 for appropriate stress category in accordance with AISC 360 Appendix 3 or contact our Technical Support team.

Combined tension and slip loading on each Type AF must comply with the following equation:

$$\left(\frac{\text{Tension Demand}}{\text{Tension Capacity}}\right)^2 + \left(\frac{\text{Slip Demand}}{\text{Slip Capacity}}\right)^2 \leq 1.0$$

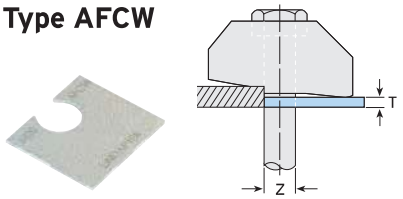
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Packing Pieces for Type AF

Packing pieces are used to increase the clamping range to suit a range of flange thicknesses. The Type AF is available with two different tail lengths (short and medium) and the correct combination of packing pieces should be used, see the table at the bottom of the page.

Packing Pieces

Type AFCW

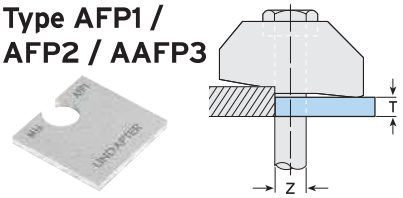


Material: Mild steel, hot dip galvanized.

Product Code	Bolt Size Z	Dimension T
LAF050CW	1/2"	1/16"
LAF062CW	5/8"	1/16"
LAF075CW	3/4"	1/16"

Note: Type AFCW has a slight bend along its center line which flattens out during installation.

Type AFP1 / AFP2 / AAFP3

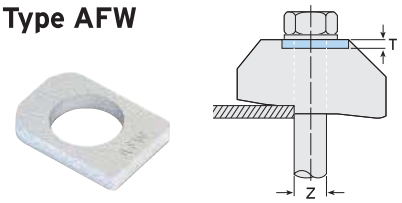


Material: Mild steel, hot dip galvanized.

Product Code	Bolt Size Z	Dimension T
LAF050P1	1/2"	3/16"
LAF062P1	5/8"	3/16"
LAF075P1	3/4"	3/16"
LAF100P1	1"	3/16"
LAF050P2	1/2"	3/8"
LAF062P2	5/8"	3/8"
LAF075P2	3/4"	3/8"
LAF100P2	1"	3/8"
LAAF075P3	3/4"	13/16"

Also Available

Type AFW



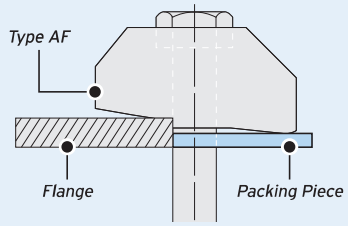
Material: SG iron, mild steel, hot dip galvanized.

Product Code	Bolt Size Z	Dimension T
LAF050W	1/2"	3/16"
LAF062W	5/8"	3/16"
LAF075W	3/4"	1/4"
LAF100W	1"	3/8"

Note: Type AFW converts the recess to a flat top to enable the bolt head or nut to be rotated on a hardened washer and is required for A325, A490 and 1" Grade 5 structural bolts.

Tail Length / Packing Piece Combinations for Type AF

Choose the correct combination for your configuration using the table on the right. **Note these calculations are for parallel flanges and beams up to 10° slopes only.** For example, a 3/4" Type AF on a 19/16" flange requires 1 x Type AF medium tail (M), 1 x Type AFCW and 2 x Type AFP2.



- **For thicker flanges contact Lindapter.**
- **For flange thicknesses that fall between those listed in the table, use the next largest packing piece combination.**
- **Other combinations than what is shown here may be possible. Please contact our Technical Support team to discuss your requirements.**

Flange Thickness	1/2"				5/8"				3/4"				1"			
	AF	AFCW	AFP1	AFP2	AF	AFCW	AFP1	AFP2	AF	AFCW	AFP1	AFP2	AF	AFCW	AFP1	AFP2
3/16"	S	-	-	-	✗	-	-	-	✗	-	-	-	✗	-	-	-
1/4"	S	-	-	-	✗	-	-	-	✗	-	-	-	✗	-	-	-
5/16"	S	1	-	-	S	-	-	-	✗	-	-	-	✗	-	-	-
3/8"	S	-	1	-	S	1	-	-	S	-	-	-	✗	-	-	-
7/16"	S	-	1	-	S	1	-	-	S	-	-	-	✗	-	-	-
1/2"	M	-	-	-	S	-	1	-	S	1	-	-	S	-	-	-
9/16"	M	1	-	-	M	-	-	-	S	2	-	-	S	-	-	-
5/8"	S	-	-	1	M	-	-	-	S	-	1	-	S	-	-	-
11/16"	M	-	1	-	M	1	-	-	M	-	-	-	S	-	-	-
3/4"	S	2	-	1	M	2	-	-	M	-	-	-	S	-	1	-
13/16"	S	-	1	1	M	-	1	-	S	-	-	1	S	-	1	-
7/8"	M	-	-	1	M	1	1	-	M	2	-	-	S	-	1	-
15/16"	M	1	-	1	M	2	1	-	M	-	1	-	S	-	-	1
1"	S	-	-	2	M	-	-	1	M	1	1	-	S	-	-	1
1 1/16"	S	1	-	2	M	1	-	1	M	2	1	-	S	-	-	1
1 1/8"	M	3	-	1	S	-	-	2	M	-	-	1	S	-	-	1
1 3/16"	S	-	1	2	M	-	1	1	M	1	-	1	M	-	-	-
1 1/4"	S	1	1	2	M	1	1	1	M	2	-	1	M	-	-	-
1 5/16"	M	-	-	2	S	-	1	2	M	-	1	1	M	-	-	-
1 3/8"	S	-	-	3	M	-	-	2	M	1	1	1	M	-	1	-
1 7/16"	M	2	-	2	M	1	-	2	M	2	1	1	M	-	1	-
1 1/2"	M	-	1	2	S	-	-	3	M	-	-	2	M	-	-	1
1 9/16"	M	1	1	2	M	-	1	2	M	1	-	2	M	-	-	1
1 5/8"	M	2	1	2	M	1	1	2	M	1	-	2	M	-	-	1
1 11/16"	M	-	-	3	S	-	1	3	M	-	1	2	M	-	1	1
1 3/4"	M	1	-	3	M	2	1	2	M	1	1	2	M	-	1	1
1 13/16"	S	-	-	4	M	-	-	3	S	-	1	3	M	-	1	1
1 7/8"	S	1	-	4	M	1	-	3	M	-	-	3	M	-	1	1
1 15/16"	M	1	1	3	M	2	-	3	S	-	-	4	M	-	-	2
2"	S	-	1	4	M	-	1	3	S	-	-	4	M	-	-	2

AF = Type AF | **AFCW** = Type AFCW | **AFP1** = Type AFP1 | **AFP2** = Type AFP2 | **S** = AF short | **M** = AF medium | ✗ = Not possible

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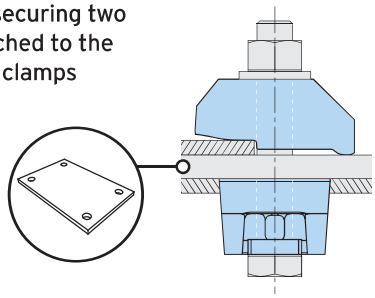
Location and End Plates for Type AF

These plates ensure the clamps and bolts are located in the correct position relative to the supporting steel. If you would like help choosing a suitable plate, please contact Lindapter.

Location Plate

Location plates are required when securing two sections together with clamps attached to the upper and lower sections with both clamps directly opposing each other.

The plate is positioned between the two sections to hold the bolts at the correct centers and should be fabricated to the dimensions shown in the table below.

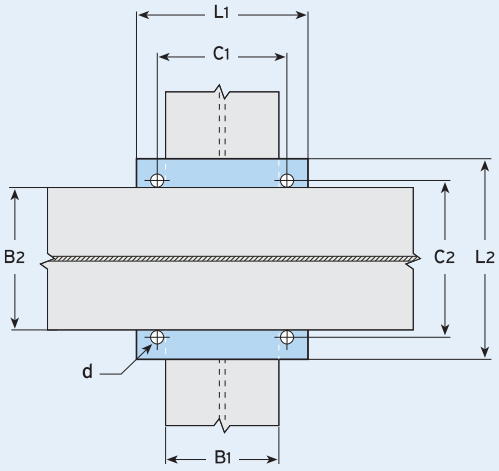


Material: Structural steel A572 Grade 50. For other grades contact Lindapter.

Bolt Size	Hole Ø	Minimum Plate Thickness for Bolt Grade		Hole Centers	Length	Hole Centers	Width
	d	5/A325	A490	C1	min L1	C2	min L2
1/2"	9/16"	1/2"	1/2"	B1 + 9/16"	B1 + 4"	B2 + 9/16"	B2 + 4"
5/8"	11/16"	5/8"	5/8"	B1 + 11/16"	B1 + 4"	B2 + 11/16"	B2 + 4"
3/4"	13/16"	3/4"	3/4"	B1 + 13/16"	B1 + 5"	B2 + 13/16"	B2 + 5"
1"	1 1/8"	1"	1"	B1 + 1 1/8"	B1 + 7"	B2 + 1 1/8"	B2 + 7"

LOCATION PLATE DIMENSIONS

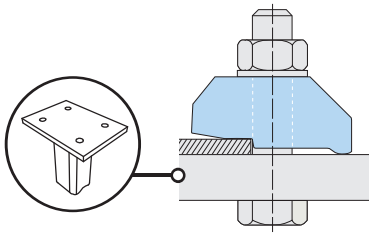
L1 = Location Plate Length, **L2** = Location Plate Width, **B1, B2** = Flange Width, **C1, C2** = Hole Centers, **d** = Hole Ø



End Plate

End Plates should be used when clamps are attached to the supporting section only.

The End Plate holds the bolts at the correct centers and should be fabricated to the dimensions shown in the table below.



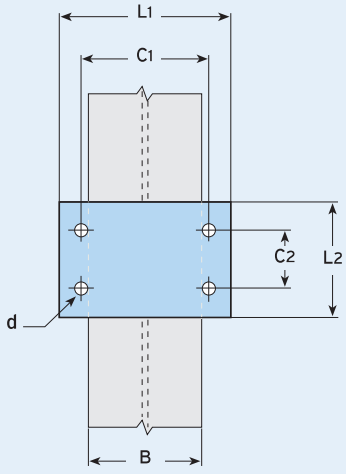
Material: Structural steel A572 Grade 50. For other grades contact Lindapter.

Bolt Size	Hole Ø	Minimum Plate Thickness for Bolt Grade[1]		Hole Centers	Length	Hole Centers	Width
	d	5/A325	A490	C1	min L1	min C2	min L2
1/2"	9/16"	1/2"	1/2"	B + 9/16"	B + 3"	3"	C2 + 3"
5/8"	11/16"	5/8"	3/4"	B + 11/16"	B + 4"	4"	C2 + 4"
3/4"	13/16"	3/4"	3/4"	B + 13/16"	B + 6"	6"	C2 + 6"
1"	1 1/8"	1"	1"	B + 1 1/8"	B + 7 1/2"	7 1/2"	C2 + 7 1/2"

1) Depending on the type of connection and associated end plate use, the thickness may need to be modified to comply with accepted local design codes.

END PLATE DIMENSIONS

L1 = End Plate Length, **L2** = End Plate Width, **B** = Flange Width, **C1, C2** = Hole Centers, **d** = Hole Ø



- **For ICC-ES approved connections the Location Plate or End Plate must be bare steel or HDG. Refer to ESR-3976 and Lindapter's Special Inspection Document for details of connection design, installation and conditions of use.**
- **Use Lindapter's Bolt Length Calculator on page 10 to calculate the correct bolt length for your application.**
- **If drilling through the flange of the supported steel please contact Lindapter to ensure suitability.**