

StiffClip® CL

Floor Tie

The Steel Network, Inc.

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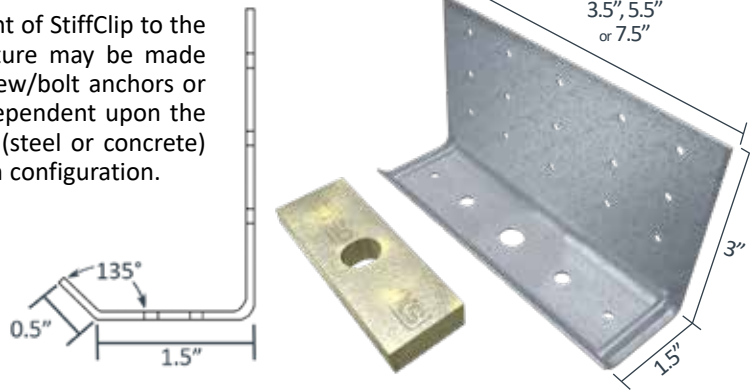
Material Composition

68mil Clip: ASTM A1003/A1003M Structural Grade 50 (340) Type H, ST50H (ST340H): 50ksi (340MPa) minimum yield strength, 65ksi (450MPa) minimum tensile strength, 68mil minimum thickness (14 gauge, 0.0713" design thickness) with ASTM A653/A653M G90 (Z275) hot dipped galvanized coating.

118mil Clip: ASTM A1003/A1003M Structural Grade 50 (340) Type H, ST50H (ST340H): 50ksi (340MPa) minimum yield strength, 65ksi (450MPa) minimum tensile strength, 118mil minimum thickness (10 gauge, 0.1242" design thickness) with ASTM A653/A653M G90 (Z275) hot dipped galvanized coating.

"H" Plate: ½" steel, ASTM A36, 36ksi min yield, 58-80ksi min tensile, with ASTM B633 Type II Yellow Zinc Coating, or Paint, or Equivalent.

The attachment of StiffClip to the primary structure may be made with PAFs, screw/bolt anchors or weld and is dependent upon the base material (steel or concrete) and the design configuration.



CL (H) Plate



US Patent #7,533,508

StiffClip CL Allowable Loads

StiffClip® CL362/400, Recommended Allowable Load (lbs and inches): F1, F2, F3, M1 & Stiffness										
Screw Patterns with #12 Screws	CL362/400-68					CL362/400-118				
	Pattern 1: 4 Screws					Pattern 1: 4 Screws				
	F1 Load Direction	F2 Load Direction	F3 Load Direction	M1 Load Direction	M1 Stiffness	F1 Load Direction	F2 Load Direction	F3 Load Direction	M1 Load Direction	M1 Stiffness
33mil (20ga), 33ksi Stud	190	535	752	1,096	108,054	190	535	752	1,096	297,794
33mil (20ga), 50ksi Stud	276	774	1,088	1,586		276	774	1,088	1,586	
43mil (18ga), 33ksi Stud	248	796	1,120	1,633		248	796	1,120	1,633	
43mil (18ga), 50ksi Stud	358	1,152	1,151	1,804		358	1,152	1,620	2,362	
54mil (16ga), 33ksi Stud	312	1,121	1,151	1,804		312	1,121	1,576	2,297	
54mil (16ga), 50ksi Stud	450	1,618	1,151	1,804		450	1,618	2,225	3,318	
68mil (14ga), 33ksi Stud	392	1,584	1,151	1,804		392	1,584	2,225	3,248	
68mil (14ga), 50ksi Stud	568	1,917	1,151	1,804		568	2,039	2,225	3,936	
97mil (12ga), 33ksi Stud	560	1,917	1,151	1,804		560	2,039	2,225	3,936	
97mil (12ga), 50ksi Stud	810	1,917	1,151	1,804		810	2,039	2,225	3,936	
118mil (10ga), 50ksi Stud	988	1,917	1,151	1,804		988	2,039	2,225	3,936	
Max Allowable Clip Load	1,416	1,917	1,151	1,804		2,423	4,107	2,225	3,936	

StiffClip® CL362/400, Recommended Allowable Load (lbs and inches): F1, F2, F3, M1 & Stiffness

Screw Patterns with #12 Screws	CL362/400-118 (H)				
	Pattern 2: 9 Screws				
	F1 Load Direction	F2 Load Direction	F3 Load Direction	M1 Load Direction	M1 Stiffness
33mil (20ga), 33ksi Stud	285	1,023	1,692	1,644	457,277
33mil (20ga), 50ksi Stud	414	1,480	2,448	2,379	
43mil (18ga), 33ksi Stud	372	1,523	2,520	2,449	
43mil (18ga), 50ksi Stud	537	2,203	3,645	3,542	
54mil (16ga), 33ksi Stud	468	2,143	3,546	3,446	
54mil (16ga), 50ksi Stud	675	3,095	5,121	4,147	
68mil (14ga), 33ksi Stud	588	3,030	5,013	4,147	
68mil (14ga), 50ksi Stud	852	3,900	5,713	4,147	
97mil (12ga), 33ksi Stud	840	3,900	5,713	4,147	
97mil (12ga), 50ksi Stud	1,215	3,900	5,713	4,147	
118mil (10ga), 50ksi Stud	1,482	3,900	5,713	4,147	
Max Allowable Clip Load	1,482	4,978	5,713	4,147	

****StiffClip CL Allowable Load tables and important notes continued on next page.**

StiffClip® CL600, Recommended Allowable Load (lbs and inches): F1, F2, F3, M1 & Stiffness										
Screw Patterns with #12 Screws	CL600-68					CL600-118				
	Pattern 3: 6 Screws					Pattern 3: 6 Screws				
	F1 Load Direction	F2 Load Direction	F3 Load Direction	M1 Load Direction	M1 Stiffness	F1 Load Direction	F2 Load Direction	F3 Load Direction	M1 Load Direction	M1 Stiffness
33mil (20ga), 33ksi Stud	285	872	1,067	1,788	160,215	285	872	1,128	1,788	354,427
33mil (20ga), 50ksi Stud	414	1,262	1,067	2,435		414	1,262	1,632	2,588	
43mil (18ga), 33ksi Stud	372	1,299	1,067	2,435		372	1,299	1,680	2,664	
43mil (18ga), 50ksi Stud	537	1,879	1,067	2,435		537	1,879	2,225	3,853	
54mil (16ga), 33ksi Stud	468	1,828	1,067	2,435		468	1,828	2,225	3,748	
54mil (16ga), 50ksi Stud	675	2,510	1,067	2,435		675	2,640	2,225	5,413	
68mil (14ga), 33ksi Stud	588	2,510	1,067	2,435		588	2,584	2,225	5,299	
68mil (14ga), 50ksi Stud	852	2,510	1,067	2,435		852	3,327	2,225	5,702	
97mil (12ga), 33ksi Stud	840	2,510	1,067	2,435		840	3,327	2,225	5,702	
97mil (12ga), 50ksi Stud	1,215	2,510	1,067	2,435		1,215	3,327	2,225	5,702	
118mil (10ga), 50ksi Stud	1,421	2,510	1,067	2,435		1,482	3,327	2,225	5,702	
Max Allowable Clip Load	1,421	2,510	1,067	2,435		2,583	4,107	2,225	5,702	

StiffClip® CL600, Recommended Allowable Load (lbs and inches): F1, F2, F3, M1 & Stiffness

Screw Patterns with #12 Screws	CL600-118 (H)				
	Pattern 4: 10 Screws				
	F1 Load Direction	F2 Load Direction	F3 Load Direction	M1 Load Direction	M1 Stiffness
33mil (20ga), 33ksi Stud	380	1,478	1,880	3,157	525,127
33mil (20ga), 50ksi Stud	552	2,138	2,720	4,568	
43mil (18ga), 33ksi Stud	496	2,201	2,800	4,702	
43mil (18ga), 50ksi Stud	716	3,184	4,050	6,801	
54mil (16ga), 33ksi Stud	624	3,097	3,940	6,617	
54mil (16ga), 50ksi Stud	900	4,473	5,690	7,306	
68mil (14ga), 33ksi Stud	784	4,379	5,570	7,306	
68mil (14ga), 50ksi Stud	1,136	5,636	6,007	7,306	
97mil (12ga), 33ksi Stud	1,120	5,636	6,007	7,306	
97mil (12ga), 50ksi Stud	1,620	5,636	6,007	7,306	
118mil (10ga), 50ksi Stud	1,976	5,636	6,007	7,306	
Max Allowable Clip Load	4,158	6,455	6,007	7,306	

StiffClip® CL800, Recommended Allowable Load (lbs and inches): F1, F2, F3, M1 & Stiffness										
Screw Patterns with #12 Screws	CL800-68					CL800-118				
	Pattern 3: 6 Screws					Pattern 3: 6 Screws				
	F1 Load Direction	F2 Load Direction	F3 Load Direction	M1 Load Direction	M1 Stiffness	F1 Load Direction	F2 Load Direction	F3 Load Direction	M1 Load Direction	M1 Stiffness
33mil (20ga), 33ksi Stud	285	973	1,077	2,483	190,670	285	973	1,128	2,483	548,677
33mil (20ga), 50ksi Stud	414	1,408	1,077	2,860		414	1,408	1,632	3,592	
43mil (18ga), 33ksi Stud	372	1,449	1,077	2,860		372	1,449	1,680	3,697	
43mil (18ga), 50ksi Stud	537	2,096	1,077	2,860		537	2,096	2,430	5,348	
54mil (16ga), 33ksi Stud	468	2,039	1,077	2,860		468	2,039	2,364	5,203	
54mil (16ga), 50ksi Stud	675	2,662	1,077	2,860		675	2,945	2,666	7,514	
68mil (14ga), 33ksi Stud	588	2,662	1,077	2,860		588	2,883	2,666	7,355	
68mil (14ga), 50ksi Stud	852	2,662	1,077	2,860		852	3,711	2,666	8,229	
97mil (12ga), 33ksi Stud	840	2,662	1,077	2,860		840	3,711	2,666	8,229	
97mil (12ga), 50ksi Stud	1,215	2,662	1,077	2,860		1,215	3,711	2,666	8,229	
118mil (10ga), 50ksi Stud	1,435	2,662	1,077	2,860		1,482	3,711	2,666	8,229	
Max Allowable Clip Load	1,435	2,662	1,077	2,860		3,356	6,410	2,666	8,229	

****StiffClip CL Allowable Load tables and important notes continued on next page.**

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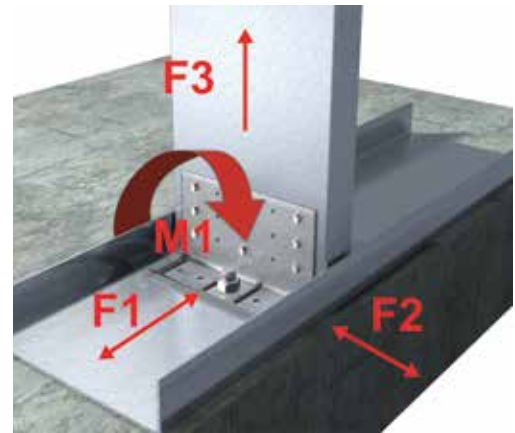
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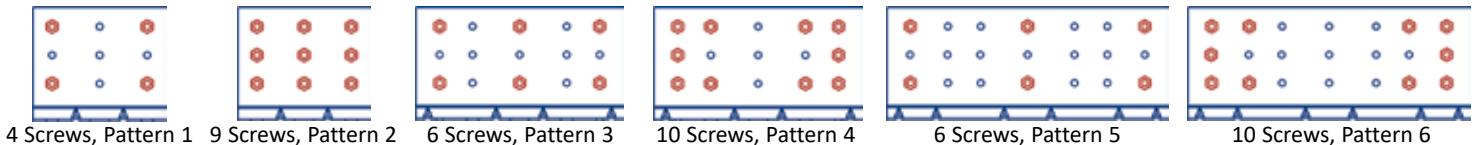


StiffClip® CL800, Recommended Allowable Load (lbs and inches): F1, F2, F3, M1 & Stiffness					
Screw Patterns with #12 Screws	CL800-118 (H)				
	Pattern 4: 10 Screws				
	F1 Load Direction	F2 Load Direction	F3 Load Direction	M1 Load Direction	M1 Stiffness
33mil (20ga), 33ksi Stud	380	1,661	1,880	4,748	696,515
33mil (20ga), 50ksi Stud	552	2,402	2,720	6,869	
43mil (18ga), 33ksi Stud	496	2,473	2,800	7,071	
43mil (18ga), 50ksi Stud	716	3,577	4,050	10,227	
54mil (16ga), 33ksi Stud	624	3,480	3,940	9,950	
54mil (16ga), 50ksi Stud	900	5,026	5,690	11,143	
68mil (14ga), 33ksi Stud	784	4,920	5,570	11,143	
68mil (14ga), 50ksi Stud	1,136	6,333	7,170	11,143	
97mil (12ga), 33ksi Stud	1,120	6,333	7,170	11,143	
97mil (12ga), 50ksi Stud	1,620	6,333	7,170	11,143	
118mil (10ga), 50ksi Stud	1,976	6,333	7,170	11,143	
Max Allowable Clip Load	4,816	8,274	7,446	11,143	

Load Direction

**Load Table Notes:**

- Design loads are for attachment of StiffClip CL to stud only. Load tables reflect in plane of wall loads (F1), horizontal loads (F2), vertical loads (F3), and overturning loads (M1).
- M1 loads are reported as Max. Load divided by a Factor of Safety. M1 loads may be limited by the Serviceability Load calculated as Clip Stiffness times the Serviceability Limit in radian.
- Stiffness is the Allowable Clip Moment divided by the clip rotation measured at half of the Max Allowable Clip Moment.
- Design loads consider loads on the clip and #12 screw fasteners to the stud web.
- Loads listed reflect force in a single direction. When multiple loads react on the connection, it is the responsibility of the designer to check the interaction of forces.
- Torsional effects are considered on screw group for F2 allowable loads. It is assumed that half of the torsional moment is taken by the connection to the structure and half is taken by the connection to the stud.
- Attachment to structure engineered by others.
- Allowable loads have not been increased for wind, seismic, or other factors.
- Allowable load tables incorporate eccentric loading of fasteners. Values with a welded connection may increase.
- Guide holes are in place for fastener installation efficiency. All guide holes may not require fasteners. Fastener amount determined by the designer. Screw fastener should be symmetrically placed in guide holes. Refer to screw pattern diagrams below for placement.
- Fasten within 3/4" from the angle heel (centerline of the 1-1/2" leg) to minimize eccentric load transfer.
- Center guide hole is 9/16" in diameter for 1/2" anchors. Middle guide holes are 5/16" in diameter for 3/8" anchors. Outer guide holes and guide holes in 3" leg are 0.141" in diameter.
- For LRFD strengths contact TSN technical services.

Screw Patterns**Nomenclature**

To specify StiffClip CL on drawings, multiply stud depth by 100, followed by the appropriate material thickness, based on strength required (see load tables). The StiffClip CL118(H) utilizes a plate in the 1½" leg (shown on page 1).

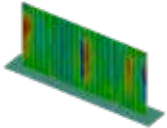
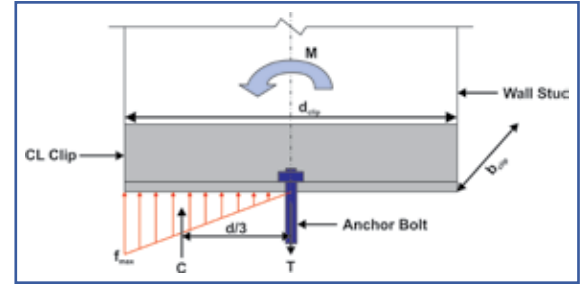
Example: 6" stud, uplift load of 650lbs

Designate: StiffClip® CL600-68

Anchor Bolt Design

The following equation for tension force in the anchor is derived using the assumed bearing stress distribution shown in the figure to the right. This assumed stress distribution provides a conservative anchor force approximation.

$$T = \frac{M}{(2/3)(d_{\text{clip}}/2)} = \frac{3M}{d_{\text{clip}}}$$



StiffClip CL Series
Blast and Seismic Design Data
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