

CFS Connections

Strong-Drive® SELF-DRILLING X METAL Screw

Common Application:

Steel decking-to-structural steel cold-formed steel framing and steel stitching

Codes/Standards: ICC-ES ESR-3006 and IAPMO-UES ER-326 (including City of LA Supplements), State of Florida FL16937, ASTM C1513 compliant, FM Approval #3045651, SDI DDM03 Appendix VII, SDI DDM04

For more information, see pp. 113 and 242, C-F-2023 Fastening Systems catalog



X Metal Screw — Cold-Formed Steel Connection Loads

Size-TPI x Length	Model No.	Nominal Dia. (in.) ⁷	Load Description	Reference Shear (lb.)						Reference Pullover (lb.)						Reference Pullout (lb.)					
				Steel Thickness: [mil (ga.)]						Steel Thickness: [mil (ga.)]						Steel Thickness: [mil (ga.)]					
				27	33	43	54	68	97	27	33	43	54	68	97	27	33	43	54	68	97
				(22)	(20)	(18)	(16)	(14)	(12)	(22)	(20)	(18)	(16)	(14)	(12)	(22)	(20)	(18)	(16)	(14)	(12)
#10-16 x 3/4	X34B1016	0.190	ASD	175	235	360	540	540	540	330	400	475	645	925	975	71	87	129	200	270	445
#10-16 x 1	XQ1S1016 X1S1016		LRFD	280	375	570	810	810	810	525	640	755	1,035	1,465	1,465	114	139	205	320	430	715
			Nominal strength	400	535	815	1,290	1,290	1,290	805	990	1,160	1,585	2,260	2,695	174	215	315	490	660	1,095
#12-14 x 1	XQ1S1214 X1S1214	0.216	ASD	176	235	385	595	840	840	295	375	525	785	1,045	1,210	74	96	147	215	325	500
			LRFD	280	375	610	950	1,265	1,265	470	600	835	1,255	1,670	1,875	117	154	235	340	520	795
			Nominal strength	400	535	870	1,350	2,135	2,135	720	920	1,285	1,925	2,565	2,965	180	235	360	520	800	1,220

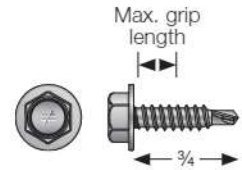
- Screws and screw connections have been tested per AISI Standard Test Method S904 and S905 with the exception of 22-gauge values which are based on calculations of the AISI S100.
- The tabulated ASD and LRFD allowable loads for cold-formed steel (CFS) members are based on the lower of the screw strength or the strength of the screw in the connected members per AISI S100.
- The safety factor Ω and resistance factor ϕ used to determine the ASD and LRFD strength are based on AISI S100.
- The nominal strength values listed are achieved under laboratory conditions and should not be used for design loads.
- Values are based on CFS members with a minimum yield strength of $F_y = 33$ ksi and tensile strength of $F_u = 45$ ksi for 43 mil (18 ga.) to 27 mil (22 ga.), minimum yield strength of $F_y = 50$ ksi and $F_u = 65$ ksi for 54 mil (16 ga.) to 97 mil (12 ga.), and a minimum yield strength of $F_y = 36$ ksi and $F_u = 58$ ksi for 1/8" and thicker.
- For design purposes, steel-sheet thicknesses are 0.0283" for 27 mil, 0.0346" for 33 mil, 0.0451" for 43 mil, 0.0566" for 54 mil, 0.0713" for 68 mil, and 0.1017" for 97 mil. The actual sheet thickness shall not be less than 95% of these design thicknesses as specified in AISI S100.
- Screw diameters per AISI S200 General Provisions Commentary Table D1-1.
- Minimum required screw length is the lesser of 3/4" or the minimum length required for the screw to extend through the steel connection a minimum of three exposed threads per 2004 AISI General Provisions Standard section D1.3.
- Screw head or washer diameter, d_w , for #10 and #12 screws is 0.398".
- The allowable load (ASD) values showing are not permitted to be increased for short duration loads such as wind or earthquake loads.
- The lower of the pullover and pullout allowable load should be used for tension design.
- The tabulated shear values are based on the thinner steel member in connection. Total steel thickness for the connection must be in the range of 1/2"-22 gauge.
- Maximum grip length for the X34B1016 is 0.34". Maximum grip length for the XQ1S1016/X1S1016 is 0.54". Maximum grip length for the XQ1S1214/X1S1214 is 0.47". Grip length is the total connection thickness plus three protruding threads.
- The XQ-S1224 screws are recommended for 16 gauge and thicker steel.

CFS Connections

Strong-Drive® SELF-DRILLING X METAL Screw (cont.)

Load Tables and Technical Data (Model Numbers: XU34B1016, XU34S1016)

The following tables provide screw properties and load information for the Simpson Strong-Tie Self-Drilling XU Metal Screws (Model Numbers: XU34B1016-5K, XU34S1016.) The loads are based on testing in accordance with AISI S904-08, *Standard Test Methods* and AISI S905-08, *Test Methods for Mechanically Fastened Cold-Formed Steel Connections*. These values are provided for use in designing cold-formed steel connections.



XU Metal Screw — Screw Properties and Strengths

Model No.		Coating	Size (TPI)	Length (in.)	Nom. Dia. (in.)	Washer Dia. (in.)	Point Size	Drill-Through Thickness ¹¹ (in.)	Nominal Strength ¹ (lb.)		Design Strength (LRFD) ² (lb.), $\Phi = 0.5$		Allowable Strength (ASD) ³ (lb.), $\Omega = 3.0$	
Bulk (5,000 ct.)	Collated								P_{SS}	P_{TS}	ΦP_{SS}	ΦP_{TS}	P_{SS}/Ω	P_{TS}/Ω
XU34B1016-5K	XU34S1016	Clear Zinc	#10–16	¾	0.19	0.475	1	0.030-0.110	1,735	2,895	870	1,450	580	965

See footnotes below.

XU Metal Screw — Cold-Formed Steel Connection Loads

Model No.	Load Description	Reference Shear (lb.)						Reference Pullover (lb.)						Reference Pullout (lb.)					
		Steel Thickness: [mil (ga.)]						Steel Thickness: [mil (ga.)]						Steel Thickness: [mil (ga.)]					
		27	33	43	54	68	97	27	33	43	54	68	97	27	33	43	54	68	97
		(22)	(20)	(18)	(16)	(14)	(12)	(22)	(20)	(18)	(16)	(14)	(12)	(22)	(20)	(18)	(16)	(14)	(12)
XU34B1016-5K XU34S1016	ASD	255	290	480	—	—	—	435	530	640	—	—	—	100	125	155	210 ⁹	400 ⁹	—
	LRFD	410	465	765	—	—	—	690	845	1,025	—	—	—	160	200	250	320 ⁹	640 ⁹	—
	Nominal Strength	580	700	1,085	—	—	—	1,060	1,310	1,570	—	—	—	247	310	395	635 ⁹	985 ⁹	—

- P_{SS} is the nominal shear strength of the screw and P_{TS} is the nominal tensile strength of the screw.
- The safety factor Ω and resistance factor Φ are calculated based on AISI S100-07 Chapter F for tested connections.
- The nominal strength values listed are achieved under laboratory conditions and should not be used for design loads.
- Values are based on CFS members with a minimum yield strength of $F_y = 33$ ksi and tensile strength of $F_u = 45$ ksi for 43 mil (18 ga.) to 27 mil (22 ga.) and minimum yield strength of $F_y = 50$ ksi and $F_u = 65$ ksi for 54 mil (16 ga.) to 97 mil (12 ga.).
- For design purposes, steel sheet thicknesses are 0.0283" for 27 mil, 0.0346" for 33 mil, 0.0451" for 43 mil, 0.0566" for 54 mil, 0.0713" for 68 mil, and 0.1017" for 97 mil. The actual sheet thickness shall not be less than 95% of these design thicknesses as specified in AISI S100-07 Section A2.4.
- Screws must extend through the steel connection a minimum of 3 exposed threads per AISI General Provisions Standard Section D1.3.
- Maximum grip length is 0.29". Grip length is the total connection thickness plus three protruding threads.
- The lower of the pullover and pullout load should be used for tension design.
- The tabulated values are based on the thinner steel member in the connection.
- Pullout values for the XU34B1016 and XU34S1016 with 54 mil and 68 mil steel thicknesses are provided for conditions in which the member in contact with the screw head is thinner than the 54 or 68 mil base material and the total material thickness is less than the 0.110". Use the thickness of the member in contact with the screw head to determine pullover value and the base member thickness (member not in contact with screw head) to determine the pullout value.
- The allowable load (ASD) values shown are not permitted to be increased for short-duration loads such as wind or earthquake loads.
- Drill-through thickness is the recommended minimum and maximum thickness of the total assembly. This includes thickness of all the members, including the gaps between them.
- Collated screw models are designed for use with the Quik Drive® system.