



X Series Screws: Technical Information: Load Tables

Screw Shear and Tension Loads

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Model No.	Size	Average Ultimate Load (lbs)		Allowable Load (ASD) (lbs)	
		Shear, P _{SS}	Tension, P _{TS}	Shear	Tension
XQ1S1016 X1S1016	#10-16 x 1"	1835	2885	610	960
XQ1S1214 X1S1214	#12-14 x 1"	2485	4045	830	1350
XQ78S1224	#12-24 x 7/8"	2800	4260	935	1420
XQ114S1224	#12-24 x 1 1/4"				
XQ112S1224	#12-24 x 1 1/2"				

- Screws have been tested per AISI Standard Test Method TS-04. The tabulated ASD loads are based on the screw average ultimate strength with a factor of safety ($\Omega = 3.0$) as determined per 2001 AISI NASPEC Supplement section E4.
- Use the member connection allowable load tables for connection design.

Cold-Formed Steel Member Connection Loads

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For reference, see [steel mil / gauge conversion table](#) below.

Model No.	Size	Nominal Dia. (in) ⁷	Load Description	Shear ^{1, 3, 13} (lbs)						Tension: Pull-Over ^{1, 3, 11} (lbs)					Tension: Pull-Out ^{1, 3, 11} (lbs)								
				Steel Thickness mil (ga) ⁶						Steel Thickness mil (ga) ⁶					Steel Thickness mil (ga) ⁶								
				33 (20)	43 (18)	54 (16)	68 (14)	97 (12)	1/8"	1/4"	33 (20)	43 (18)	54 (16)	68 (14)	97 (12)	33 (20)	43 (18)	54 (16)	68 (14)	97 (12)	3/16"	1/4"	1/2"
Hex Washer Head Screw – Steel to Steel																							
XQ1S1016 X1S1016	#10-16 x 1"	0.190	Allowable Load ²	290	410	610	610	610	—	—	710	760	960	960	960	145	145	245	290	605	—	—	—
			Average Ultimate Load ⁴	655	930	1835	1835	1835	—	—	1745	1860	2885	2885	2885	355	355	605	705	1480	—	—	—
XQ1S1214 X1S1214	#12-14 x 1"	0.216	Allowable Load ²	290	395	725	830	830	—	—	455	680	1000	1030	1350	135	145	220	245	545	—	—	—
			Average Ultimate Load ⁴	660	900	1640	2485	2485	—	—	1110	1665	2450	2520	4045	335	360	540	655	1405	—	—	—
XQ78S1224	#12-24 x 7/8"	0.216	Allowable Load ²	230	350	605	785	935	935 ¹²	935 ¹²	290	400	685	840	1390	80	115	190	275	460	730	1375	1420 ¹²
XQ114S1224	#12-24 x 1 1/4"		Average Ultimate Load ⁴	550	920	1380	1780	2800	2800 ¹²	2800 ¹²	875	980	1675	2055	3400	205	280	475	680	1130	1990	3370	4260 ¹²
XQ112S1224	#12-24 x 1 1/2"																						

- Screws and screw connections have been tested per AISI Standard Test Method TS-4 and TS-5.
- The tabulated ASD 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 2001 AISI NASPEC & 2004 NASPEC Supplement section E4.
- The safety factor is based on AISI NASPEC Chapter F for tested connections.
- The average ultimate values listed are achieved under laboratory conditions and should not be used for design loads.
- Values are based on cold-formed steel (CFS) members with a minimum yield strength of Fy=33 ksi and tensile strength of Fu=45 ksi for 43 mil (18 ga) to 33 mil (20 ga), minimum yield strength of Fy=50 ksi and Fu=65 ksi for 54 mils (16 ga) to 97 mil (12 ga), and a minimum yield strength of Fy=36 ksi and Fu=58 ksi for 1/8" and thicker.
- For design purposes, steel sheet thicknesses are 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 thickness as specified in AISI/COS/NASPEC 2001 AISI Standard section A2.4.
- Screw diameters per 2004 AISI 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 3 exposed threads per 2004 AISI General Provisions Standard section D1.3.
- Washer diameter, d_w for #10 and #12 screws is 0.375" min.
- 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 pull-over and pull-out allowable load should be used for tension design.
- Not applicable for XQ78S1224.
- The tabulated shear values are based on the thinner steel member in the connection. Steel thickness for both members must be in the range of the 1/4"-20 gauge.

Steel Thickness

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Gauge	Mils	Design Thickness		Minimum Thickness	
		Inches	(mm)	Inches	(mm)
Cold-Formed Steel					
20 (structural)	33	0.0346	0.88	0.0329	0.84
18	43	0.0451	1.14	0.0428	1.09
16	54	0.0566	1.44	0.0538	1.37
14	68	0.0713	1.81	0.0677	1.72
12	97	0.1017	2.58	0.0966	2.45
Hot-Rolled Structural Steel²					
1/8"		0.1250	3.18	0.1150	2.92
3/16"		0.1875	4.76	0.1775	4.51
1/4"		0.2500	6.35	0.2400	6.10
1/2"		0.5000	12.7	0.4900	12.45

1. One "mil" is 1/1000 (.001) of an inch. Mil thickness measures the uncoated based material.
2. Minimum thickness is based on ASTM A6-07 permitting under design thickness by 0.01".