General Stud Specifications

Standard Arc Welding Studs (AWS Type A) —Tensile and Torque Strengths

Mild Steel – 61,000psi Minimum Ultimate, 49,000 psi Minimum Yield

Thread Diameter	META[1] (sq. in.)	Yield Load[2] (lbs.) at 49,000 psi	Ultimate Tensile Load (lbs) at 61,000 psi	Yield Torque[2] (ft-lbs) at 49,000 psi	Ultimate Torque (ft-lbs) at 61,000 psi	Shear Strength (75% of Tensile Strength)
10-24 UNC	0.0174	853	1,061	2.7	3.4	796
10-32 UNF	0.0199	975	1,214	3.1	3.8	910
1/4-20 UNC	0.0317	1,553	1,934	6.5	8.1	1,450
1/4-28 UNF	0.0362	1,774	2,208	7.4	9.2	1,656
5/16-18 UNC	0.0522	2,558	3,184	13.3	16.6	2,388
5/16-24 UNF	0.0579	2,837	3,532	14.8	18.4	2,649
3/8-16 UNC	0.0773	3,788	4,715	23.7	29.5	3,536
3/8-24 UNF	0.0876	4,292	5,344	26.8	33.4	4,008
7/16- 14 UNC	0.1060	5,194	6,466	37.9	47.1	4,850
7/16-20 UNF	0.1185	5,807	7,229	42.3	52.7	5,421
1/2-13 UNC	0.1416	6,938	8,638	57.8	72.0	6,478
1/2-20 UNF	0.1597	7,825	9,742	65.2	81.2	7,306
5/8-11 UNC	0.2256	11,054	13,762	115.2	143.4	10,321
5/8-18 UNF	0.2555	12,520	15,586	130.4	162.3	11,689
3/4-10 UNC	0.3340	16,366	20,374	204.6	254.7	15,281
3/4-16 UNF	0.3724	18,248	22,716	228.1	284.0	17,037
7/8-9 UNC	0.4612	22,599	28,133	329.6	410.3	21,100
7/8-14 UNF	0.5088	24,931	31,037	363.6	452.6	23,278
1-8 UNC	0.6051	29,650	36,911	494.2	615.2	27,683
1-14 UNF	0.6791	33,276	41,425	554.6	690.4	31,069

*Torque figures based on assumption that excessive deformation of thread has not taken relationship between torque/tension out of its proportional range.

In actual practice, stud should not be used at its yield load. A factor of safety must be applied. It is generally recommended that studs not be used at more than 60% of yield strength, however, the factor of safety may vary up or down according to the particular application in which the studs are being used.

The user of these studs will make this determination.

	Ultimate Tensile	L = SA	Ultimate Torque	T = 0.2 x D x L ÷ 12
	Yield	Z = YA	Yield Torque	T = 0.2 x D x Z ÷ 12
Where	D =	Nominal Thread Diameter (in)	A =	Mean Effective Thread Area (META) (in²)
	S =	Tensile Stress (psi)	Y =	Yield Stress (psi)
	L =	Tensile Load (lbs)	Z =	Yield Load (lbs)
	T =	Torque (ft-lbs)		

1 META is used instead of root area in calculating screw lengths because of closer correlation with actual tensile strength. META is based on mean diameter, which is the diameter of an imaginary co-axial cylinder whose surface would pass through the thread profile approximately midway between the minor and pitch diameters.

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Nelson Stud Welding, Inc.
7900 West Ridge Road
Elyria, Ohio 44035

Phone: 1-800-NEL-WELD
1-800-635-9353
Email: Nelson.Sales@NelsonStud.com