

## Standard Arc Welding Studs — Tensile/Torque Strengths

Low-Carbon Steel — 55 000 psi Min. Ultimate, 50 000 psi Min. Yield

Stud Thread Diameter	META sq. in.	Yield Load (lb) @ 50 000 psi	Ultimate Tensile Load (lb) @ 55 000	Yield Torque* @ 50 000 psi	Ultimate Torque* @ 55 000 psi
10-24 UNC	.017	870	957	33 in. lb	36 in. lb
10-32 UNF	.020	1,000	1,105	37 in. lb	41 in. lb
1/4-20 UNC	.032	1,590	1,743	6 ft lb	7 ft lb
1/4-28 UNF	.036	1,810	1,990	7 ft lb	8 ft lb
5/16-18 UNC	.052	2,620	2,871	13 ft lb	15 ft lb
5/16-24 UNF	.058	2,895	3,184	15 ft lb	17 ft lb
3/8-16 UNC	.078	3,875	4,250	24 ft lb	27 ft lb
3/8-24 UNF	.088	4,380	4,818	27 ft lb	30 ft lb
7/16-14 UNC	.106	5,315	5,830	38 ft lb	42 ft lb
7/16-20 UNF	.118	5,900	6,490	43 ft lb	47 ft lb
1/2-13 UNC	.142	7,095	7,810	59 ft lb	65 ft lb
1/2-20 UNF	.160	8,000	8,800	66 ft lb	73 ft lb
5/8-11 UNC	.226	11,300	12,430	118 ft lb	130 ft lb
5/8-18 UNF	.255	12,750	14,025	133 ft lb	146 ft lb
3/4-10 UNC	.334	16,700	18,370	209 ft lb	230 ft lb
3/4-16 UNF	.372	18,600	20,460	232 ft lb	256 ft lb
7/8-9 UNC	.462	23,100	25,355	337 ft lb	370 ft lb
7/8-14 UNF	.509	23,450	27,995	371 ft lb	408 ft lb
1-8 UNC	.606	30,300	33,275	505 ft lb	555 ft lb
1-14 UNF	.678	33,900	37,290	565 ft lb	621 ft lb

\*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 a stud should not be used at its yield load. A factor of safety must be applied. It is generally recommended that studs be used at no more than 60% of yield. However, factor of safety may vary up or down, depending on the particular application. The user will make this determination.

Formula used to calculate above data is as follows:

where

- D = Nominal Thread Diameter
- A = Mean Effective Thread Area (META)<sup>1</sup>
- S = Tensile Stress in psi
- L = Tensile Load in Pounds
- T = Torque in Inch Pounds
- Y = Yield Stress in psi
- Z = Yield Load in Pounds

Ultimate Tensile	L = SA	Ultimate Torque	T = .2 × D × L
Yield	Z = YA	Yield Torque	T = .2 × D × Z

1. META are used instead of root area in calculating screw strengths because of closer correlation with actual tensile strength. META are 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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