General Information for Stud Welding Studs

Standard Arc Welding Studs – Tensile and Torque Strengths

High Strength Steel – 115,000 psi Minimum Ultimate, 105,000 psi Minimum Yield

Thread Diameter	META [1] (sq. in.)	Yield Load (lbs.) at 105,000 psi	Ultimate Tensile Load (lbs) at 115,000 psi	Yield Torque [2] (ft-lbs) at 105,000 psi	Shear Strength [3] (75% of Tensile Strength)
M8 (0.315" dia.)	0.0567	5,954	6,521	31	4,890
M10 (0.394" dia.)	0.0899	9,440	10,399	61	7,754
M12 (0.472" dia.)	0.1306	13,713	15,019	97	11,318
5/16-18	0.0520	5,460	5,980	28	4,485
3/8-16	0.0780	8,910	8,970	51	6,727
1/2-13	0.1420	14,910	21,300	124	15,975

* 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

Formulae used to make the above calculations are as follows:

Ultimate Tensile	L = SA	Ultimate Torque	T = 0.2 x D x L
Yield	Z = YA	Yield Torque	T = 0.2 x D x Z

Where D = Nominal Thread Diameter; A = Mean Effective Thread Area (META)
S = Tensile Stress (psi); Y = Yield Stress (psi)
L = Tensile Load (lbs); Z = Yield Load
T = Torque (in-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.

2 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 will make this safety factor determination

3 Shear values are based on Tensile Strength of the stud.

Stored Arc ™ Welding Studs – Tensile/Yield Strengths

Mild Steel – 61,000 psi Ultimate, 50,000 psi Yield
Stainless Steel – 75,000psi Minimum Ultimate, 30,000 psi Minimum Yield
Aluminum – 21,000 psi Ultimate , 20,000 psi Yield

Thread Diameter	Ultimate Tensile Load (lbs)			Yield Load (lbs)		
	Mild Steel	Stainless Steel	Aluminum	Mild Steel	Stainless Steel	Aluminum
6-32 UNC	458	687	192	321	275	183
8-32 UNC	705	1,057	296	493	423	282
10-24 UNC	870	1,305	365	609	522	348
10-32 UNF	1,005	1,507	422	704	603	402
1/4-20 UNC	1,585	2,377	666	1,110	951	634
1/4-28 UNF	1,810	2,715	760	1,267	1,086	724