General Material Specifications

Material Specifications

Nelson's studs may be made of one of the following materials, as specified on individual specification sheets. Certificates of chemical analysis and physical properties are available, upon request. All physical and chemical properties are independent of stud size or shape.

Mild Steel

Standard mild steel studs manufactured by Nelson conform to ASTM A29 chemistry specifications for grades 1010 through 1020 mild steels. Physical properties of mild steel Nelson studs are in accordance with AWS D1.1. Special studs can also be manufactured of other weldable mild steels. Heat treatments and plating can be applied to mild steel studs, upon request.

Mild Steel Chemical Composition

Element	Minimum wt%	Maximum wt%
C	0.08	0.23
Mn	0.30	0.90
P	--	0.04
S	--	0.05

Stainless Steel

Standard Nelson studs manufactured of stainless steel conform to ASTM A276 or A493 specifications. Studs can be manufactured from other weldable stainless steel alloys. Mechanical properties of Nelson stainless steel studs depend on the cold working or heat treatment applied to the studs after forming. Stainless steel studs can be annealed, upon request.

Stainless Steel Chemical Composition

Element	UNS 30430 (302HQ)		UNS 30403 (304L)		UNS 31603 (316L)	
	Minimum wt%	Maximum wt%	Minimum wt%	Maximum wt%	Minimum wt%	Maximum wt%
C	--	0.08	--	0.03	--	0.03
Cr	17.00	19.00	18.00	20.00	16.00	18.00
Ni	8.00	10.00	8.00	12.00	10.00	14.00
Mn	--	2.00	--	2.00	--	2.00
Cu	3.00	4.00	--	--	--	--

Mechanical Properties - Standard

Minimum Values	Mild Steel Shear and Concrete Anchors *AWS Type B*	Standard Mild Steel Studs *AWS Type A*	Mild Steel Deformed Bar Anchors ***AWS Type C***	Stainless Steel Studs, as formed ***AWS D1.6***
Ultimate Tensile (psi), Rm	65,000	61,000	80,000	70,000
Yield, 0.2% offset (psi), Re	51,000	49,000	70,000	35,000
% Elongation, A5, in 2" gage length	20	17	N/A	40
% Area Reduction (min)	50	50	N/A	N/A

Mechanical Properties - Metric

Minimum Values	Mild Steel Shear and Concrete Anchors *AWS Type B*	Standard Mild Steel Studs *AWS Type A*	Mild Steel Deformed Bar Anchors ***AWS Type C***	Stainless Steel Studs, as formed ***AWS D1.6***
Ultimate Tensile (MPa), Rm	448	420	551	482
Yield, 0.2% offset (MPa), Re	351	337	482	241
% Elongation, A5, in 2" gage length	20	17	N/A	40
% Area Reduction (min)	50	50	N/A	N/A

General Material Specifications

Aluminum

Nelson manufactured aluminum studs are made from Aluminum Association (AA) alloys 1100, 5086, 5356, and 6061. Aluminum studs can be annealed upon request. The chemical composition and physical properties of these alloys are shown below.

Aluminum Alloy Chemical Composition

Element	Gas Arc, Stored Arc		Drawn				Capacitor Discharge Only[1]	
	Alloy 1100 ASTM B211		Alloy 5356		Alloy 5086 ASTM B211		Alloy 6061 ASTM B211	
	Minimum wt%	*Maximum wt%*	*Minimum wt%*	*Maximum wt%*	*Minimum wt%*	*Maximum wt%*	*Minimum wt%*	*Maximum wt%*
Al	99	--	93.05	95.34	93.15	96.25	96.00	98.61
Cr	--	--	0.05	0.20	0.05	0.25	0.04	0.35
Cu	0.05	0.20	--	0.10	--	0.10	0.15	0.4
Mn	--	0.05	0.05	0.20	0.20	0.70	--	0.15
Si	N/A	N/A	--	0.25	--	0.40	0.40	0.80
Fe	N/A	N/A	--	0.40	--	0.50	--	0.70
Si+Fe	--	0.95	N/A	N/A	N/A	N/A	N/A	N/A
Zn	--	0.10	--	0.10	--	0.25	--	0.25
Mg	--	--	4.50	5.50	3.50	4.50	0.80	1.20
Ti	--	--	0.06	0.20	--	0.15	--	0.15

Mechanical Properties – Standard

Minimum Values	1100 H-16	5356 H-32	5086 H-32	6061- T-6
Ultimate Tensile (psi), Rm	21,000	46,000	42,000	45,000
Yield, 0.2% offset (MPa), Re	20,000	32,000	30,000	40,000
% Elongation, A5, in 2" gage length	17	24	12	17
% Area Reduction	N/A	N/A	N/A	N/A

Mechanical Properties - Metric

Minimum Values	1100 H-16	5356 H-32	5086 H-32	6061- T-6
Ultimate Tensile (psi), Rm	144	317	289	310
Yield, 0.2% offset (MPa), Re	137	220	206	275
% Elongation, A5, in 2" gage length	17	24	12	17
% Area Reduction	N/A	N/A	N/A	N/A

[1]TPA insulation pins are Alloy 1100

General Stud Specifications

Cold Heading

The primary method used by Nelson to produce stud welded fasteners is the Cold Forming process. Utilizing the same cold heading production equipment, Nelson produces an extensive line of non-welded, cold- formed parts. These parts can be custom designed to satisfy the specific requirements of individual customers.

Pictured at right are just some of the many different cold-formed parts and shapes that Nelson is capable of producing. If you are currently purchasing cold-formed or screw-machined parts, Nelson may be able to offer cost savings and quality improvements.

To understand Nelson's capabilities and to determine if cold forming will benefit you, consult the following specification:

Should You Inquire About Nelson's Cold Forming Capability? *The answer is YES if*

- Your part is 1" or less in diameter, and the shank diameter is 1" or less, and the length is less than 15"
- Your part is assembled from several components
- Your annual part volume is 100,000 pieces or more
- You currently experience substantial material waste
- You require closer tolerances
- You need greater process control capability (higher CPK)
- You desire greater part strength and/or better surface finish is desired
- You have not shopped your part cost in several years

Nelson's Capabilities

- Wire diameter ranging from 1/8" (0.125") through 1"
- Upset forming diameters up to 225% of wire diameter
- Cut-off length up to 15"
- Up to five dies and hammers can be used to progressively form complex shapes
- Upsets, forward and backward extrusions, punched and through holes, flanges, collars, heads, and other forming techniques can be accommodated
- Production rates from 45 to 450 pieces per minute
- Complete secondary operations
- In-house tool and die design and fabrication

Submit the following information for a FREE Cost Quotation:

- Part drawing with critical dimensions
- Order quantity and annual volume
- A sample of the part you are currently purchasing
- Your target pricing

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.

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.***

General Stud Specifications

Stainless Steel (As Formed) – 70,000 psi Minimum Ultimate, 35,000 psi Minimum Yield

Thread Diameter	META[1] (sq. in.)	Yield Load[2] (lbs.) at 35,000 psi	Ultimate Tensile Load (lbs) at 70,000 psi	Yield Torque[2] (ft-lbs) at 35,000 psi	Ultimate Torque (ft-lbs) at 70,000 psi	Shear Strength (75% of Tensile Strength)
10-24 UNC	0.0174	609	1,218	1.9	3.9	914
10-32 UNF	0.0199	697	1,393	2.2	4.4	1,045
1/4-20 UNC	0.0317	1,110	2,219	4.6	9.2	1,664
1/4-28 UNF	0.0362	1,267	2,534	5.3	10.6	1,901
5/16-18 UNC	0.0522	1,827	3,654	9.5	19.0	2,741
5/16-24 UNF	0.0579	2,027	4,053	10.6	21.1	3,040
3/8-16 UNC	0.0773	2,706	5,411	16.9	33.8	4,058
3/8-24 UNF	0.0876	3,066	6,132	19.2	38.3	4,599
7/16- 14 UNC	0.1060	3,710	7,420	27.1	54.1	5,565
7/16-20 UNF	0.1185	4,148	8,295	30.2	60.5	6,221
1/2-13 UNC	0.1416	4,956	9,912	41.3	82.6	7,434
1/2-20 UNF	0.1597	5,590	11,179	46.6	93.2	8,384
5/8-11 UNC	0.2256	7,896	15,792	82.3	164.5	11,844
5/8-18 UNF	0.2555	8,943	17,885	93.2	186.3	13,414
3/4-10 INC	0.3340	11,690	23,380	146.1	292.3	17,535
3/4-16 UNF	0.3724	13,034	26,068	162.9	325.9	19,551
7/8-9 UNC	0.4612	16,142	32,284	235.4	470.8	24,213
7/8-14 UNF	0.5088	17,808	35,616	259.7	519.4	26,712
1-8 UNC	0.6051	21,179	42,357	353.0	706.0	31,768
1-14 UNF	0.6791	23,769	47,537	396.1	792.3	35,653

*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.

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.***

General Stud Specifications

High Strength Steel – 110,000† psi Minimum Ultimate, 92,000 psi Minimum Yield

Thread Diameter	META[1] (sq. in.)	Yield Load[2] (lbs.) at 92,000 psi	Ultimate Tensile Load (lbs) at 110,000 psi	Yield Torque[2] (ft-lbs) at 92,000 psi	Shear Strength (75% of Tensile Strength)
M10 (0.394" dia.)	0.0899	8271	9889	54.3	7417
3/8-16	0.0773	7112	8503	44.3	6377
1/2-13	0.1417	13036	15587	108.6	11690

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

†Dependent on diameter. Consult Nelson Stud Welding for additional information.

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. **High Strength (HS) studs should not be welded to A36 structural steel.**

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.

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.***

Stored Arc Welding Studs—Tensile/Yield Strengths

Mild Steel – 50,000 psi Ultimate, 35,000 psi Yield

Stainless Steel – 70,000 psi Ultimate, 35,000 psi Yield

Aluminum – 21,000 psi Ultimate, 20,000 psi Yield

Thread Diameter	META[1] (sq. in.)	Ultimate Tensile Load (lbs)			Yield Load (lbs)		
		Mild Steel	Stainless Steel	Aluminum	Mild Steel	Stainless Steel	Aluminum
6-32 UNC	0.0090	450	630	189	315	315	180
8-32 UNC	0.0139	695	973	292	487	487	278
10-24 UNC	0.0174	870	1218	365	609	609	348
10-32 UNF	0.0199	995	1393	418	697	697	398
1/4-20 UNC	0.0317	1585	2219	666	1110	1110	634
5/16-18 UNC	0.0522	2610	3654	1096	1827	1827	1044

General Stud Specifications

Stud Dimensions

The length dimension, L, shown throughout the specification sheets, is the overall stud length before weld. The after weld in-place length will be shorter, depending on the size of the stud, the welding process, and weld settings. Approximate length reductions are shown in the table below.

Stud Diameter	Weld Process	Length Reduction
10 (0.134") and 12 gauge (0.105") TPC pins	Stored Arc	--
6-32 through 1/4-20, ATC, ATS, ATA, and FTC studs	Stored Arc	$^{1}/_{32}$"
10 gauge (0.134") P2P pins	Electric Arc	$^{3}/_{32}$"
3/16" through 1/2" diameter studs	Electric Arc	$^{1}/_{8}$"
5/8" through 7/8" diameter studs	Electric Arc	$^{3}/_{16}$"
1" diameter or larger studs	Electric Arc	$^{1}/_{4}$"
1/4" and 1/2" H4L Weld Through Metal Deck	Electric Arc	$^{3}/_{16}$" – ¼ "
5/8" H4L Weld Through Metal Deck	Electric Arc	$^{5}/_{16}$" – $^{3}/_{8}$"
3/4" S3L Weld Through Metal Deck	Electric Arc	$^{3}/_{8}$" – $^{7}/_{16}$"
M6 and 6mm diameter studs	Electric Arc	2mm
M8, 8mm, M10, 10mm, and M12 diameter studs	Electric Arc	3mm
12mm, M16, and 16mm diameter studs	Electric Arc	4mm
M20, 19mm, and 20mm diameter studs	Electric Arc	5mm
M24, 22mm, and 24mm diameter studs	Electric Arc	6mm

The stud length reduction is also often known as "burn-off."

The stud end configuration (chamfer, concentricity, and manufacturer's identification) of studs and pins will be selected at our option, depending on production requirements.

Threads

The standard external threads on studs are UNC-2A, and internal threads are UNC-2B, prior to plating. Other threads are available upon request. Standard thread length is 3". Longer thread lengths may be ordered. Whenever possible, threads are cold-rolled. The surface quality and strength of rolled threads is greatly improved compared to cut threads. The surface finish on rolled threads is less subject to wear and offers more corrosion resistance than cut threads.

Flux

Flux quality and quantity is an essential factor for obtaining consistent weld results. All standard stud weld Nelson studs 5/16" diameter and greater have a solid flux load. Rectangular studs 1/8" x 5/8" and less are not fluxed.

Plating

Plating is useful to increase a stud's corrosion resistance. Unless otherwise specified at the time of order, all Nelson studs will be supplied un-plated. Upon request, the following types of surface protection are available:

Zinc Plating – ASTM B-633
Zinc Dichromating – ASTM B633 Fe/Zn 8
Copper Plating
Nickel Plating

Zinc plating will adversely affect the weld quality. For this reason, the weld ends of stud weld studs are not plated.

Annealing

Nelson studs can be post annealed to a maximum of 75 Rockwell B hardness (HRB) for low carbon steel and 85 HRB for stainless steel. An extra charge is applicable for annealing and will be quoted if specified at the time of order.

Ferrules

For weld integrity, certain stud types must be welded using a ceramic ferrule. Appropriate ceramic ferrules are included in the stud purchase price. Ferrules will be shipped with studs, when required. Ferrules for welding special applications should be specified when orders for studs are placed.

General Stud Specifications

Accessories

Accessories depend on the stud type, diameter, length, and the ferrule being used, along with any specific fixturing or job conditions or restrictions. For accessory information, please refer to the stud, ferrule, and accessory specifications.

Weld Flash

When a stud is end-welded, weld metal forms around its base. The weld flash dimension is controlled by the design of the ferrule used. The diameter of the weld metal is generally larger than the diameter of the stud. Consideration is required in the design of mating parts that involve weld flash. Refer to the appropriate stud specification sheets for recommended weld flash clearance hole diameters.

Ordering

Each stud ordered from Nelson Stud Welding should be listed separately along with the appropriate ferrule. The stud style should be specified as well as the length, diameter, material, quantity, and any other information according to the stud specification sheet.

Your Nelson representative will be happy to advise you on the accessories required for welding the stud ordered, and is also available to aid in determining the proper stud for your application requirements.

Weight Charts for Shipping

Threaded Studs

Approximate Weight of Threaded Studs per 1000 (length before welding is used to determine weight) Weights are in pounds. To convert to kilograms, multiply values below by 0.4536

Stud Length	Diameter							
	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8
¾	8.3	12.8	18.8	25.5	34.5	--	--	--
1	11.0	17.0	25.0	34.0	46.0	70.0	--	--
1 ¼	13.8	21.3	31.3	42.5	57.5	87.5	133.8	--
1 ½	16.5	25.5	37.5	51.0	69.0	105.0	160.5	243.8
1 ¾	19.3	29.8	43.8	59.5	80.5	122.5	187.3	284.4
2	22.0	34.0	50.0	68.0	92.0	140.0	214.0	325.0
2 ¼	24.8	38.3	56.3	76.5	103.5	157.5	240.8	365.6
2 ½	27.5	42.5	62.5	85.0	115.0	175.0	267.5	406.3
2 ¾	30.3	46.8	68.8	93.5	126.5	192.5	294.3	446.9
3	33.0	51.0	75.0	102.0	138.0	210.0	312.0	487.5
3 ¼	35.8	55.3	81.3	110.5	149.5	227.5	347.8	528.1
3 ½	38.5	59.5	87.5	119.0	161.0	245.0	374.5	568.8
3 ¾	41.3	63.8	93.8	127.5	172.5	262.0	401.3	609.4
4	44.0	68.0	100.0	136.0	184.0	280.0	428.0	650.0
4 ¼	46.8	72.3	106.3	144.5	195.5	297.5	454.8	690.6
4 ½	49.5	76.5	112.5	153.0	207.0	315.0	481.5	731.3
4 ¾	52.3	80.8	118.8	161.5	218.5	332.5	508.3	771.9
5	55.0	85.0	125.0	170.0	230.0	350.0	535.0	812.0
Each Additional Inch	11.0	17.0	25.0	34.0	46.0	70.0	107.0	162.5
Add for Collar Studs	5.8	7.2	9.0	12.8	13.0	--	--	--
Ferrule	2.0	2.5	3.0	3.5	4.0	5.0	10.0	12.0

General Stud Specifications

Weight Charts for Shipping

Unthreaded Studs

Approximate Weight of Threaded Studs per 1000 (length before welding is used to determine weight) Weights are in pounds. To convert to kilograms, multiply values below by 0.4536

Length	Diameter								
	3/16	¼	5/16	3/8	7/16	½	5/8	¾	7/8
¾	6.0	10.5	16.4	23.5	31.9	41.7	--	--	--
1	8.0	14.0	21.8	31.3	42.5	55.6	86.6	--	--
1 ¼	10.0	17.5	27.3	39.1	53.1	69.5	108.3	156.0	--
1 ½	12.0	21.0	32.7	47.0	63.8	83.4	129.9	187.2	255.0
1 ¾	14.0	24.5	38.2	54.8	74.4	97.3	151.6	218.4	297.5
2	16.0	28.0	43.6	62.6	85.0	111.2	173.2	249.6	340.0
2 ¼	18.0	31.5	49.1	70.4	95.6	125.1	194.9	280.8	382.5
2 ½	20.0	35.0	54.5	78.3	106.3	139.0	216.5	312.0	425.0
2 ¾	22.0	38.5	60.0	86.1	116.9	152.9	238.2	343.2	467.5
3	24.0	42.0	65.4	93.9	127.5	166.8	259.8	374.4	510.0
3 ¼	26.0	45.5	70.9	101.7	138.1	180.7	281.5	405.6	552.5
3 ½	28.0	49.0	76.3	117.4	148.8	194.6	303.1	436.8	595.0
3 ¾	30.0	52.5	81.8	125.2	159.4	208.5	324.8	468.0	637.5
4	32.0	56.0	87.2	125.2	170.0	222.4	346.4	499.2	680.0
4 ¼	34.0	59.5	92.7	133.0	180.6	236.3	368.1	530.4	722.5
4 ½	36.0	63.0	98.1	140.9	191.3	250.2	389.7	561.6	765.0
4 ¾	38.0	66.5	103.6	148.7	210.9	264.1	411.4	592.8	807.5
5	40.0	70.0	109.0	156.5	212.5	278.0	433.0	624.0	850.0
Each Additional Inch	8.0	14.0	21.8	31.3	42.5	55.6	86.6	124.8	170.0
Ferrule	3.0	3.5	4.0	5.0	6.0	7.5	9.0	27.0	37.0

General Stud Specifications

Weight Charts for Shipping

Shear Connectors

Approximate Weight of Threaded Studs per 1000 (length before welding is used to determine weight) Weights are in pounds. To convert to kilograms, multiply values below by 0.4536

S3L Shear Connector Description	Small Shear Cartons				
	Weight Per Box, w/o Box	Quantity Per Box	Quantity Per Pallet	Weight Per 1000 Pieces	Net Weight of Pallet
3/4 x 3 3/16	60.9	130	3,510	468	1,643
3/4 x 3 3/8	58.9	120	3,240	488	1,589
3/4 x 3 7/8	60.2	110	2,970	548	1,625
3/4 x 4 3/16	55.5	95	2,565	585	1,499
3/4 x 4 7/8	54.3	80	2,160	678	1,466
3/4 x 5 3/16	56.6	80	2,160	708	1,529
3/4 x 5 3/8	56.3	75	2,025	750	1,519
3/4 x 5 7/8	56.6	70	1,890	794	1,529
3/4 x 6 3/16	49.8	60	1,620	825	1,345
3/4 x 7 3/16	51.9	55	1,485	946	1,403
3/4 x 8 3/16	42.9	40	1,080	1,067	1,158
7/8 x 3 11/16	61.3	85	2,295	726	1,656
7/8 x 4 3/16	60.0	75	2,025	811	1,642
7/8 x 5 3/16	58.2	60	1,620	980	1,584
7/8 x 6 3/16	56.6	50	1,350	1,153	1,528
7/8 x 7 3/16	52.0	40	1,080	1,320	1,426
7/8 x 8 3/16	49.9	35	945	1,473	1,391

Headed Anchors

Approximate Weight of Threaded Studs per 1000 (length before welding is used to determine weight) Weights are in pounds. To convert to kilograms, multiply values below by 0.4536

H4L Headed Anchor Description	Small Shear Cartons				
	Weight Per Box w/o Box	Quantity Per Box	Quantity Per Pallet	Weight Per 1000 Pieces	Net Weight of Pallet
1/4 x 2 11/16	44.0	1000	27,000	44	1,188
1/4 x 4 1/8	36.0	550	14,850	65	965
3/8 x 4 1/8	58.0	375	10,125	155	1,569
3/8 x 6 1/8	29.7	140	3,780	212	802
1/2 x 2 1/8	67.0	400	10,800	170	1,836
1/2 x 3 1/8	60.0	275	7,425	226	1,678
1/2 x 4 1/8	50.0	180	4,860	282	1,370
1/2 x 5 5/16	41.0	120	3,240	341	1,107
1/2 x 6 1/8	40.1	105	2,835	393	1,114
1/2 x 8 1/8	33.0	65	1,755	504	885
5/8 x 2 11/16	61.0	195	5,265	315	1,658
5/8 x 4 3/16	55.0	125	3,375	450	1,518
5/8 x 6 9/16	45.0	70	1,890	652	1,232
5/8 x 8 3/16	40.0	50	1,350	793	1,070

General Stud Specifications

Weight Charts for Shipping

Weights listed in tables do not include weight of box.

Empty shear carton: 1.00 lb. each Pallet size: 36” x 36”
Shear cartons: 27 per pallet Approximate volume of pallet: 18 cu. ft. (0.51 cu. meter)

NOTE: All dimensions have been calculated at the mean dimensions of the tolerance allowance, and will vary if the product is at a minimum or maximum of tolerance.

Insulation Fastener Quantities

Insulation Pin Type	Quantity Per Carton
10 ga. P2P less than 2-1/2”	5,000
10 ga. P2P 3” long	4,000
10 ga. P2P 3-1/2” through 6” long	2,000
12 ga. CHP with 1-3/16” dia. head, all lengths	1,000
10 ga. CHP with 1-1/2” dia. head, all lengths	1,000
10 ga. CHP with 1-1/2” dia. head, 2” through 3”	500

Insulation Pin Type	Quantity Per Carton
10 ga. and 12 ga. TPC less than 2-1/2”	5,000
10 ga. and 12 ga. TPC 2-1/2” through 6”	2,500
1” x 1-1/4” Rectangular Speed Clip	5,000
1-1/2” Square Speed Clip	3,000
1-1/2” Round Speed Clip	5,000
2-1/2” Square Speed Clip	1,000
2” Round Speed Clip	1,000

Deliveries

Delivery on stock items will be made within three (3) days following the date of order receipt. Non-stock items or special items, which require manufacture, will be acknowledged in writing with a delivery promise.

Extra Charges

Stock items are not subject to additional charges.

With approval from Nelson, a non-stock item may be given production priority if required before the acknowledged delivery date. Should such a service be required and approved, the customer will be charged an extra “break-in” fee.

A non-stock or special stud that requires manufacturing may be subject to a set-up charge for setting dies onto the machines and changing production processes.