General Information for Stud Welding Studs

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 A –108 specifications for 1010 through 1020 mild steels. Physical properties and chemical composition 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 A –276 or A –493 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	302HQ (30430) All other studs		316L (31603) Shear and Concrete Anchors	
	Minimum wt%	Maximum wt%	Minimum wt%	Maximum wt%
C	--	0.12	--	0.03
Cr	17.00	20.00	16.00	18.00
Ni	8.00	13.00	10.00	14.00
Mn	--	2.00	--	2.00
Cu	3.00	4.00	--	--

Mechanical Properties - Standard

Minimum Values	Mild Steel Shear and Concrete Anchors	Standard Mild Steel Studs	Mild Steel Deformed Bar Anchors	Stainless Steel Studs, as formed	Stainless Steel Studs, as formed, post-annealed
Yield, 0.2% offset (psi), R_e	51,000	49,000	70,000	50,000	30,000
Ultimate Tensile (psi), R_m	65,000	61,000	80,000	75,000	70,000
% Elongation, A_5, in 2" gage length	20	17	N/A	40	40
% Area Reduction	N/A	N/A	N/A	50	50

Mechanical Properties - Metric

Minimum Values	Mild Steel Shear and Concrete Anchors	Standard Mild Steel Studs	Mild Steel Deformed Bar Anchors	Stainless Steel Studs, as formed	Stainless Steel Studs, as formed, post-annealed
Yield, 0.2% offset (MPa), R_e	350	340	485	345	206
Ultimate Tensile (MPa), R_m	450	420	552	517	483
% Elongation, A_5, in 5 x diameter	20	17	N/A	40	40
% Area Reduction	N/A	N/A	N/A	50	50

General Information for Stud Welding Studs

Aluminum

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

Aluminum Alloy Chemical Composition

Element	Alloy 1100		Alloy 5356		Alloy 6061	
	Minimum wt%	Maximum wt%	Minimum wt%	Maximum wt%	Minimum wt%	Maximum wt%
Al	99	--	94.6	94.6	98	98
Cr	--	--	0.05	0.2	0.04	0.35
Cu	0.05	0.2	--	0.1	0.15	0.4
Mn	--	0.05	0.05	0.2	--	0.15
Si	N/A	N/A	--	0.25	0.4	0.8
Fe	N/A	N/A	--	0.4	--	0.7
Si + Fe	--	0.95	N/A	N/A	N/A	N/A
Zn	--	0.1	--	0.1	--	0.25
Mg	--	--	4.5	5.5	0.8	1.2
Ti	--	--	0.06	0.2	--	0.15

Mechanical Properties - Standard

Minimum Values	1100 H-16	5356 H-32	6061- T-6
Yield, 0.2% offset (psi), R_e	20,000	32,000	40,000
Ultimate Tensile (psi), R_m	21,000	46,000	45,000
% Elongation, A_5, in 2" gage length	17	24	17
% Area Reduction	N/A	N/A	N/A

Mechanical Properties - Metric

Minimum Values	1100 H-16	5356 H-32	6061- T-6
Yield, 0.2% offset (MPa), R_e	138	221	276
Ultimate Tensile (MPa), R_m	145	317	310

General Information for Stud Welding Studs

Standard Arc Welding Studs – Tensile and Torque Strengths

Mild Steel – 61,000psi Minimum Ultimate, 50,000 psi Minimum Yield

Thread Diameter	META[1] (sq. in.)	Yield Load (lbs.) at 50,000 psi	Ultimate Tensile Load (lbs) at 61,000 psi	Yield Torque[2] (ft-lbs) at 50,000 psi	Ultimate Torque (ft-lbs) at 61,000 psi	Shear Strength[3] (75% of Tensile Strength)
10-24 UNC	0.0174	870	1,061	2.7	3.3	796
10-32 UNF	0.0199	1,000	1,220	3.1	3.8	915
1/4-20 UNC	0.0317	1,590	1,940	6.6	8.1	1,455
1/4-28 UNF	0.0362	1,810	2,208	7.5	9.2	1,656
5/16-18 UNC	0.0522	2,620	3,196	13.6	16.6	2,397
5/16-24 UNF	0.0579	2,895	3,532	15.1	18.4	2,649
3/8-16 INC	0.0773	3,875	4,728	24.2	29.5	3,546
3/8-24 UNF	0.0876	4,380	5,344	27.4	33.4	4,008
7/16- 14 UNC	0.1060	5,315	6,484	38.7	47.2	4,863
7/16-20 UNF	0.1185	5,900	7,198	43.0	52.4	5,399
1/2-13 UNC	0.1416	7,095	8,656	59.1	72.1	6,492
1/2-20 UNF	0.1597	8,000	9,760	66.7	81.3	7,320
5/8-11 UNC	0.2256	11,300	13,786	117.7	143.6	10,340
5/8-18 UNF	0.2555	12,750	15,555	132.8	162.0	11,666
3/4-10 INC	0.3340	16,700	20,374	208.8	254.7	15,281
3/4-16 UNF	0.3724	18,600	22,692	232.5	283.7	17,019
7/8-9 UNC	0.4612	23,100	28,182	336.9	411.0	21,137
7/8-14 UNF	0.5088	25,450	31,049	371.1	452.8	23,287
1-8 UNC	0.6051	30,300	36,966	505.0	616.1	27,725
1-14 UNF	0.6791	33,900	41,358	565.0	689.3	31,019

* 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.

General Information for Stud Welding Studs

Stainless Steel (Post Annealed) – 70,000psi Minimum Ultimate, 30,000 psi Minimum Yield

Thread Diameter	META[1] (sq. in.)	Yield Load (lbs.) at 30,000 psi	Ultimate Tensile Load (lbs) at 70,000 psi	Yield Torque[2] (ft-lbs) at 30,000 psi	Ultimate Torque (ft-lbs) at 70,000 psi	Shear Strength[3] (75% of Tensile Strength)
10-24 UNC	0.0174	522	1,218	1.6	3.8	913
10-32 UNF	0.0199	600	1,393	1.9	4.4	1,045
1/4-20 UNC	0.0317	954	2,219	4.0	9.2	1,664
1/4-28 UNF	0.0362	1,086	2,534	4.5	10.5	1,900
5/16-18 UNC	0.0522	1,572	3,654	8.2	19.0	2,740
5/16-24 UNF	0.0579	1,737	4,053	9.0	21.1	3,040
3/8-16 INC	0.0773	2,325	5,411	14.5	33.9	4,058
3/8-24 UNF	0.0876	2,628	6,132	16.4	38.4	4,599
7/16- 14 UNC	0.1060	3,189	7,420	23.2	54.2	5,565
7/16-20 UNF	0.1185	3,540	8,295	25.8	60.2	6,221
1/2-13 UNC	0.1416	4,257	9,912	35.5	82.8	7,434
1/2-20 UNF	0.1597	4,800	11,179	40.0	93.3	8,384
5/8-11 UNC	0.2256	6,780	15,795	70.6	164.8	11,846
5/8-18 UNF	0.2555	7,650	17,885	79.7	185.9	13,414
3/4-10 INC	0.3340	10,020	23,380	125.3	292.2	17,535
3/4-16 UNF	0.3724	11,160	26,068	139.5	325.5	19,551
7/8-9 UNC	0.4612	13,860	32,284	202.1	471.6	24,213
7/8-14 UNF	0.5088	15,270	35,616	222.7	519.6	26,712
1-8 UNC	0.6051	18,180	42,357	303.0	707.0	31,768
1-14 UNF	0.6791	20,340	47,537	339.0	791.0	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

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.

General Information for Stud Welding Studs

Stainless Steel (As Formed)) – 75,000psi Minimum Ultimate, 50,000 psi Minimum Yield

Thread Diameter	META[1] (sq. in.)	Yield Load (lbs.) at 50,000 psi	Ultimate Tensile Load (lbs) at 75,000 psi	Yield Torque[2] (ft-lbs) at 50,000 psi	Ultimate Torque (ft-lbs) at 75,000 psi	Shear Strength[3] (75% of Tensile Strength)
10-24 UNC	0.0174	870	1,305	2.4	4.1	979
10-32 UNF	0.0199	1,000	1,500	2.8	4.7	1,125
1/4-20 UNC	0.0317	1,590	1,590	5.8	9.9	1,789
1/4-28 UNF	0.0362	1,810	1,810	6.8	11.3	2,036
5/16-18 UNC	0.0522	2,620	3,930	12.1	20.4	2,948
5/16-24 UNF	0.0579	2,895	4,343	13.8	22.6	3,257
3/8-16 INC	0.0773	3,875	5,813	21.6	36.3	4,359
3/8-24 UNF	0.0876	4,380	6,570	25.4	41.1	4,928
7/16- 14 UNC	0.1060	5,315	7,973	34.6	58.1	5,979
7/16-20 UNF	0.1185	5,900	8,850	39.8	64.5	6,638
1/2-13 UNC	0.1416	7,095	10,643	53.2	88.7	7,982
1/2-20 UNF	0.1597	8,000	12,000	62.3	100.0	9,000
5/8-11 UNC	0.2256	11,300	16,950	106.6	176.6	12,713
5/8-18 UNF	0.2555	12,750	19,125	125.1	199.2	14,344
3/4-10 INC	0.3340	16,700	25,050	190.7	313.1	18,788
3/4-16 UNF	0.3724	18,600	27,900	219.9	348.8	20,925
7/8-9 UNC	0.4612	23,100	34,650	309.1	505.3	25,998
7/8-14 UNF	0.5088	25,450	38,175	351.5	556.7	28,631
1-8 UNC	0.6051	30,300	45,450	464.0	757.5	34,088
1-14 UNF	0.6791	33,900	50,850	534.4	847.5	38,138

* 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.

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 50,000 psi	Ultimate Tensile Load (lbs) at 61,000 psi	Yield Torque[2] (ft-lbs) at 50,000 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

General Information for Stud Welding Studs

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 – 1/4"
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 maximum thread length is 3". 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 quality. All standard stud weld Nelson studs 5/16" diameter and greater have a solid flux load. Rectangular studs up to 1/8" x 5/8"are not fluxed.

Plating

Plating is useful to increase a stud's corrosion resistance wear. Unless otherwise specified at the time of order, all Nelson studs will be supplied unplated. 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 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.

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.

General Information for Stud Welding Studs

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

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
3/4	8.3	12.8	18.8	25.5	34.5	--	--	--
1	11.0	17.0	25.0	34.0	46.0	70.0	--	--
1-1/4	13.8	21.3	31.3	42.5	57.5	87.5	133.8	--
1-1/2	16.5	25.5	37.5	51.0	69.0	105.0	160.5	243.8
1-3/4	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
2-1/4	24.8	38.3	56.3	76.5	103.5	157.5	240.8	365.6
2-1/2	27.5	42.5	62.5	85.0	115.0	175.0	267.5	406.3
2-3/4	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
3-1/4	35.8	55.3	81.3	110.5	149.5	227.5	347.8	528.1
3-1/2	38.5	59.5	87.5	119.0	161.0	245.0	374.5	568.8
3-3/4	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
4-1/4	46.8	72.3	106.3	144.5	195.5	297.5	454.8	690.6
4-1/2	49.5	76.5	112.5	153.0	207.0	315.0	481.5	731.3
4-3/4	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 Information for Stud Welding Studs

Approximate Weight of Unthreaded 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	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8
3/4	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	--	--
1-1/4	10.0	17.5	27.3	39.1	53.1	69.5	108.3	156.0	--
1-1/2	12.0	21.0	32.7	47.0	63.8	83.4	129.9	187.2	255.0
1-3/4	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
2-1/4	18.0	31.5	49.1	70.4	95.6	125.1	194.9	280.8	382.5
2-1/2	20.0	35.0	54.5	78.3	106.3	139.0	216.5	312.0	425.0
2-3/4	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
3-1/4	26.0	45.5	70.9	101.7	138.1	180.7	281.5	405.6	552.5
3-1/2	28.0	49.0	76.3	117.4	148.8	194.6	303.1	436.8	595.0
3-3/4	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
4-1/4	34.0	59.5	92.7	133.0	180.6	236.3	368.1	530.4	722.5
4-1/2	36.0	63.0	98.1	140.9	191.3	250.2	389.7	561.6	765.0
4-3/4	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

Approximate Weight of Shear Connectors
(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	1067	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	1153	1,528
7/8 x 7-3/16	52.0	40	1,080	1320	1,426
7/8 x 8-3/16	49.9	35	945	1473	1,391

General Information for Stud Welding Studs

Approximate Weight of Headed Anchors
(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	2937	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	79.	1,070

Above weights do not include weight of box.
Empty shear carton: 1.00 lb. each
Shear cartons: 27 per pallet
Pallet size: 36” x 36”
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 Fasteners - Quantity Per Carton

Insulation Pin Type	Quantity Per Carton
10 ga. P2P less than 2-1/2” long	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” long	500

Insulation Pin Type	Quantity Per Carton
10 ga. and 12 ga. TPC less than 2-1/2” long	5,000
10 ga. and 12 ga. TPC 2-1/2” through 6” long	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.

Packing other than standard and export packaging is subject to extra charge. Quotation will be made on request.

For stud diameters, lengths, and materials other than shown, consult your Nelson Sales Representative.