NELSON®

2020 Stud, Ferrule & Accessory Catalog

STANLEY®
Engineered Fastening

2020 Nelson® Stud Welding Stud, Ferrule & Accessory Catalog

This catalog is designed to be a user-friendly source of information about the Nelson Stud Welding line of studs, anchors, pins, and the standard accessories used to weld them. Many features have been incorporated into the pages of this digital catalog to enable you, the customer, to find the information you need quickly and easily.

Many studs, pins, anchors, and ferrules are featured to provide the greatest range of possible solutions to your stud welding applications.

- Bookmarks have been added to make navigation through the catalog quick and easy.
- Text explanations have been added to clarify some of the potential uses of each stud.
- Suggestions for similar use studs will assist you in making the correct stud choice for your stud welding application.
- PDF format creates a quicker downloading, more informative catalog that is readable on both IBM and Macintosh platforms. Security features assure that the information you download from our web site is genuine Nelson information.
- Links embedded in each page take you right to the information you need, making the stud information more easily accessible.
- Detailed ferrule and accessory information allows you to identify and specify the exact parts you need to execute the job.
- Clickable table of contents and indexes quickly locates the stud information you need.
- Studs are indexed by welding process and use in industry to make finding the stud you need faster and easier.
- Company contact information is provided on every specification sheet to make communication with Nelson Stud Welding faster than ever before!

Thank you for choosing to download this catalog. We think you will find it the most useful and informative method to explore the Nelson Stud Welding product line.

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Using the 2020 Nelson Stud Welding, Inc. Electronic Catalog

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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

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General Stud Specifications

Material Specifications

Nelson produces weld studs made from a variety of materials to meet global customer requirements. The following common material properties are listed, as specified by the referenced specification sheets and construction codes. The stated physical requirements and chemical properties listed apply regardless of stud size or shape. Certificates of conformance, chemical analysis and physical properties are available upon request. Please consult your Nelson representative for any materials not covered or specific questions regarding material grades.

Weld Processes

Welding processes

- Drawn Arc
- Short Cycle
    - (Gas Arc) – short cycle with gas
- Capacitor Discharge

Shielding types.

- Ferrule
- Gas
- Ferrule with gas

Stud Dimensions

The length dimension, L, shown throughout the specification sheets, is the overall stud length before weld. The after weld, in-place length of the stud will be shorter. Length reduction is dependent on the diameter of the stud, the welding process and weld settings.

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	$^{1}/_{4}$"
1/2" 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 end configuration (chamfer, concentricity, and manufacturer’s identification) of studs and pins will be selected at our option, depending on production requirements.

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General Stud Specifications

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.

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.

Standard thread length is 3" but longer thread lengths may be ordered.

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.

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.

Plating

Plating is available to increase a stud's corrosion resistance properties. Upon request, several types of surface protection are available, consult your Nelson representative for more information.

Unless otherwise specified at the time of order, all Nelson studs will be supplied un-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.

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 appropriate 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.

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General Stud Specifications

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 and aid in determining the proper stud for your application requirements.

Nelson representatives are also available to help to determine the welding parameters, accessories, fixtures or additional tools required to properly weld Nelson studs.

When ordering, specify: Type, Diameter, Before Weld Length, Material, Quantity, and Part Number

***Example*: NBL 3/8 x 1-1/8"; Stainless Steel; 10,000 pieces; #101064458**

Recipe Code for Stud Type

Nelson uses a recipe code to specify and describe standard round stud types. The letters are used according to this recipe code to describe the thread, base, shank, flux, and material of Nelson studs.

Three letters are used to identify standard Drawn Arc weld studs.

Four letters are used to identify Capacitor Discharge studs. CD studs have a "T" added to indicate that the studs have timing tips.

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General Stud Specifications - Shipping Information

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.

Weight Charts for Shipping

- The following weights listed in the tables do not include weight of box.
- All product 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.

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)

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General Stud Specifications - Shipping Information

Threaded Studs

Approximate Weight of Threaded Studs per 1000 (length before welding is used to determine weight) Weights are in pounds.

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

Unthreaded Studs

Approximate Weight of Unthreaded Studs per 1000 (length before welding is used to determine weight) Weights are in pounds.

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

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General Stud Specifications - Shipping Information

Shear Connectors

Approximate Weight of Shear Connector 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 Headed Anchor Stud 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

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General Stud Specifications - Shipping Information

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

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General Material Specifications

Mild Steel

Standard mild steel studs manufactured for the U.S. domestic market 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.

ASTM A29 Grade 1010 - 1020 Chemical Composition

Element	Minimum wt%	Maximum wt%
C	0.08	0.23
Mn	0.3	0.9
P	--	0.04
S	--	0.05

ISO 13918, Groups SD1, SD2 Chemical Composition

Element	Minimum wt%	Maximum wt%
C		0.200
Al	0.020	
CEV *		0.350

$$CEV = \%C + \frac{\%Mn}{6} + \frac{(\%Cu+\%NI)}{15} + \frac{(\%Cr+\%Mo+\%V)}{5}$$

		AWS D1.1			ISO 13918		ASTM A706
		Type A	Type B	Type C	SD1	SD2	Grade 60
Ultimate Tensile	PSI	61,000	65,000	80,000			80,000
Yield (0.2% offset) (min)	PSI	49,000	51,000	-			60,000
Yield (0.2% offset) (max)	PSI	-	-	-			78,000
Yield (0.5% offset)	PSI	-	-	70,000			
% Elongation, in 2" gage length	% min	17%	20%	-			
% Elongation, in 5x diameter	% min	14%	15%	-			
% Elongation, in 8" *	% min	-	-	-			14%
% Area Reduction	% min	50%	50%	-			
Metric (Equivalent)							
Ultimate Tensile, Rm	MPa	420	450	552	450	400 - 550	552
Yield (0.2% offset), Re	MPa	351	337	482	350	235	420
% Elongation, A5	% min	17%	20%	-	15%	20%	-
% Elongation, in 5x diameter	% min	14%	15%	-			
% Elongation, in 8" *	% min	-	-	-			14%
% Area Reduction	% min	50%	50%	-			

* Minimum elongation for bar diameters up to 3/4"

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General Material Specifications

Mild Steel

Standard Arc Welding Studs (AWS D1.1 Type A) —Tensile and Torque Strengths						
Thread Diameter	META[1] (sq. in.)	Yield Load [2] (lbs.)	Ultimate Tensile Load (lbs.)	Yield Torque [2 3] (ft-lbs)	Ultimate Torque (ft-lbs)	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	0.106	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	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	0.334	16,366	20,374	204.6	254.7	15,281
3/4-16 UNF	0.3724	18,248	22,716	228.1	284	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

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

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)		

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General Material Specifications

High Strength Steel [4]

Standard Nelson studs manufactured of high strength steel conform to… limited up to 3/4" diameter.

Comparison of Nelson High Strength Studs to Common Industry Specifications

Property (Minimum Values)	Nelson High Strength Studs	SAE Grade 5 Bolts	ISO 898-1, Class 8.8 Bolts
Tensile Strength	**110,000†**	120,000	116,000
Yield Strength	92,000	92,000	92,000
Hardness (HRC)	22-34	25-34	22-32
Elongation (2")	6.5%	14%	-
Reduction in Area	42%	35%	-

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

High Strength Arc Welding Studs —Tensile and Torque Strengths						
Thread Diameter	**META [1] (sq. in.)**	**Yield Load [2] (lbs.)**	**Ultimate Tensile Load (lbs.)**	**Yield Torque [2 3] (ft-lbs)**	**Ultimate Torque (ft-lbs)**	**Shear Strength (75% of Tensile Strength)**
M10 (0.394" dia.)	0.0899	8271	9,889	54.3		7417
3/8-16 UNC	0.0773	7,112	8,503	44.3		6,377
1/2-13 UNC	0.1417	13,036	15,587	108.6		11,690

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

4 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) (in^2)
	S = Tensile Stress (psi)		Y = Yield Stress (psi)
	L = Tensile Load (lbs)		Z = Yield Load (lbs)
	T = Torque (ft-lbs)		

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General Material Specifications

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.

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	--	--	--	--

		AWS D1.6		ISO 13918
		Type A	Type B	SD3
Ultimate Tensile	PSI	70000	80000	
Yield (0.2% offset) (min)		35000	70000	
Yield (0.2% offset) (max)		-	-	
% Elongation, in 2"	% min	40%	-	
Metric (Equivalent)				
Ultimate Tensile, Rm	MPa	490	550	500 - 780
Yield (0.2% offset), Re		245	490	350
% Elongation, A5	% min		-	25%
% Area Reduction		-	-	

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General Material Specifications

Stainless Steel

Standard Arc Welding Studs (AWS D1.6 Type A) —Tensile and Torque Strengths						
Thread Diameter	META[1] (sq. in.)	Yield Load [2] (lbs.)	Ultimate Tensile Load (lbs.)	Yield Torque [2 3] (ft-lbs)	Ultimate Torque (ft-lbs)	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	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	0.106	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 UNC	0.334	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	706	31,768
1-14 UNF	0.6791	23,769	47,537	396.1	792.3	35,653

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

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)		

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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.

Element	Drawn Arc				Capacitor Discharge Only[1]		Gas Arc, Stored Arc	
	Alloy 5356		Alloy 5086 ASTM B211		Alloy 6061 ASTM B211		Alloy 1100 ASTM B211	
	Minimum wt%	*Maximum wt%*	*Minimum wt%*	*Maximum wt%*	*Minimum wt%*	*Maximum wt%*	*Minimum wt%*	*Maximum wt%*
Al	93.05	95.34	93.15	96.25	96	98.61	99	--
Cr	0.05	0.2	0.05	0.25	0.04	0.35	--	--
Cu	--	0.1	--	0.1	0.15	0.4	0.05	0.2
Mn	0.05	0.2	0.2	0.7	--	0.15	--	0.05
Si	--	0.25	--	0.4	0.4	0.8	N/A	N/A
Fe	--	0.4	--	0.5	--	0.7	N/A	N/A
Si+Fe	N/A	N/A	N/A	N/A	N/A	N/A	--	0.95
Zn	--	0.1	--	0.25	--	0.25	--	0.1
Mg	4.5	5.5	3.5	4.5	0.8	1.2	--	--
Ti	0.06	0.2	--	0.15	--	0.15	--	--

[1]TPA insulation pins are Alloy 1100

		1100 H-16	5356 H-32	5086 H-32	6061- T-6
Ultimate Tensile	**PSI**	21,000	46,000	42,000	45,000
Yield (0.2% offset) (min)		20,000	32,000	30,000	40,000
Yield (0.2% offset) (max)		-	-	-	-
% Elongation, in 2" gage length	**% min**	17	24	12	17
% Area Reduction		N/A	N/A	N/A	N/A
Minimum Values					
Ultimate Tensile, Rm	**MPa**	144	317	289	310
Yield (0.2% offset), Re		137	220	206	275
% Elongation, A5	**% min**	17	24	12	17
% Area Reduction		N/A	N/A	N/A	N/A

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General Material Specifications

Stored Arc

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

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General Material Specifications

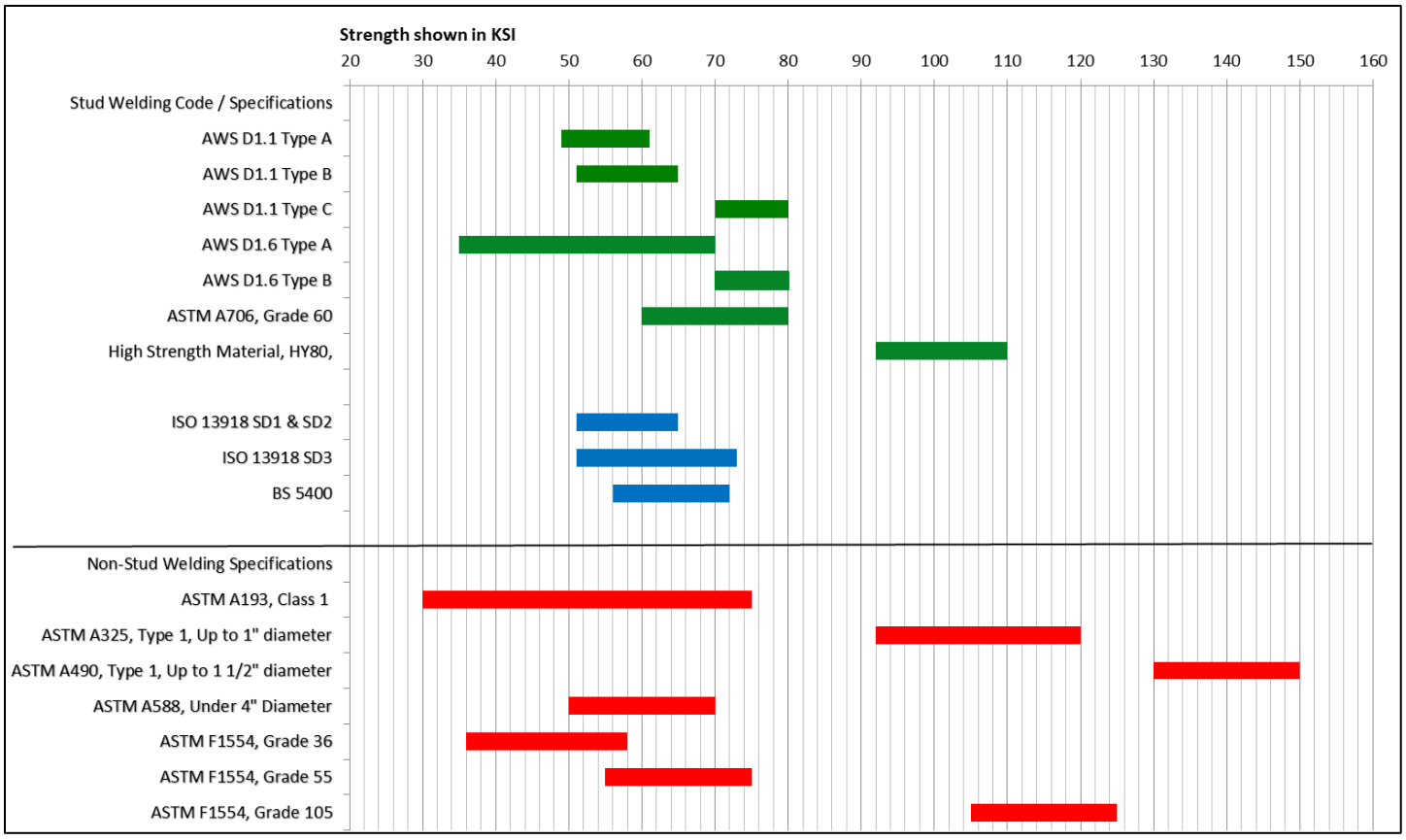
Material Specifications

Nelson produces weld studs made from a variety of materials to meet global customer requirements. The following common material properties are listed, as specified by the referenced specification sheets and construction codes. The stated physical requirements and chemical properties listed apply regardless of stud size or shape. Certificates of conformance, chemical analysis and physical properties are available upon request. Please consult your Nelson representative for any materials not covered or specific questions regarding material grades.

Standard Material Strength Requirement Comparison

The following chart compares the minimum yield to tensile strength range for a number of commonly used Drawn Arc stud welding standards.

This chart also includes standard fastener specifications commonly confused with weld studs.



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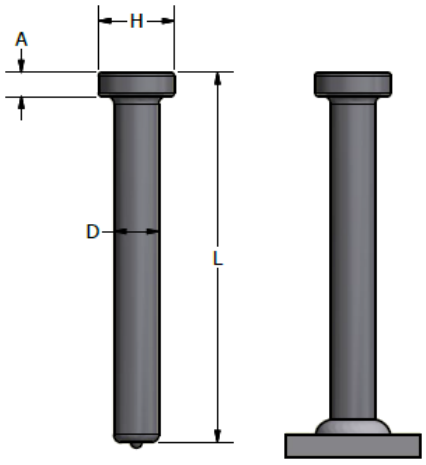
Nelson Stud Specification

Headed Anchors

H4L Headed Concrete Anchors

Nelson headed concrete anchors deliver code specified embedded tension and shear strength values between steel and concrete. These anchors meet requirements of the following codes:

- AWS D1.1 Structural Welding Code – Steel, Type B
- AWS D1.6 Structural Welding Code – Stainless Steel, Type A
- AASHTO/AWS D1.5 Bridge Welding Code
- ISO-13918 Welding – Studs for Arc Stud Welding
- Canadian Standards Association, W59 – Welded Steel Construction, Type B
- International Building Code Section 19



See also: ICC-ES Evaluation Report ESR-2856 Nelson Shear Connectors

Headed anchors are widely used in precast, cast-in-place or composite steel construction for miscellaneous embedded plates, frames, curbing, attachments and connections.

For similar function studs, see Nelson S3L Shear Connectors and D2L Deformed Bar Anchors.

Stud Diameter D	Burn Off	A	H	Required Standard Accessories			
				Chuck	Foot	Grip for Flat	Ferrule for Flat
1/4"	0.125	0.187	0.500	500 001 014	502 002 001	501 003 007	100 101 067
3/8"	0.125	0.281	0.750	500 001 018	502 002 001	501 003 009	100 101 099
1/2"	0.125	0.312	1.000	500 001 085	502 002 002	501 003 010	100 101 114
5/8"	0.187	0.312	1.250	500 001 088	502 002 002	501 003 014	100 101 187
Metric							
6	3.00	0.19	0.50	500 001 014	502 002 001	501 003 007	100 101 067
10	3.00	0.28	0.75	500 001 018	502 002 001	501 003 009	100 101 099
13	3.00	0.31	1.00	500 001 085	502 002 002	501 003 010	100 101 114
16	4.00	0.31	1.25	500 001 088	502 002 002	501 003 014	100 101 187

Feet 502 002 001 and 502 002 002 are used with Nelson's heavy duty gun.
Feet 502 002 045 and 502 002 046 are used with Nelson's standard duty gun.

MATERIALS: Studs are available in Low Carbon Mild Steel and 316L Stainless Steel. For specific grade information and physical and chemical properties, and conforming standards, please see General Material Specifications. Certified Material Test Reports (CMTR) and Certificates of Compliance (COC) are available and must be requested at time of order.

For ferrules and grips used in welding at an angle to plate, welding to angles, and welding to a vertical base plate, see the Special Applications section of the Ferrule Specifications.

FLUX: All Nelson concrete anchors have a solid flux load.

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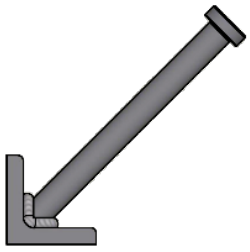
Nelson Stud Specification

Headed Anchors

H4L Headed Concrete Anchors

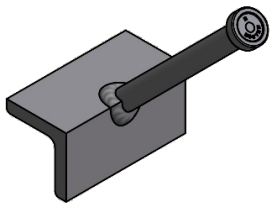
Nelson headed concrete anchors are designed to be welded to a variety of structural steel shapes.

For welding into the fillet or onto the heel of an angle it is important that the studs are long enough to provide adequate anchorage length for concrete



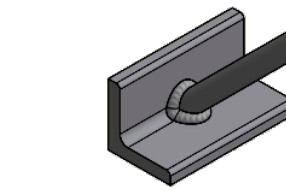
Ferrule and Accessories for welding studs in fillet of angles					
Stud Dia.	**Ferrule**	**Fillet Radius**	**Chuck**	**Grip****	**Foot***
1/4"	100 106 001	0.125	500 001 014	501 004 003	502 002 001
3/8"	100 106 002	0.250	500 001 018	501 004 006	502 002 001
1/2"	100 103 009	0.250	500 001 085	501 004 008	502 002 001
1/2"	100 103 011	0.375	500 001 085	501 004 008	502 002 001
5/8"	100 106 005	0.375	500 001 088	501 004 009	502 002 002
3/4"	100 106 004	0.375	500 001 088	501 004 014	502 002 002
3/4"	100 103 012	0.750	500 001 088	501 004 014	502 002 002

* 502 022 045 or 502 002 046 Split Feet used with Standard Duty Guns
502 002 001 or 502 002 002 Split Feet used with Heavy Duty Guns
**Long length Split Grips are needed to reach into angles



Ferrule and Accessories for welding studs to heel of angles				
Stud Dia.	**Ferrule**	**Chuck**	**Grip**	**Foot***
1/4"	100 102 005	-	-	-
3/8"	100 105 001	500 001 018	501 003 008	502 002 001
1/2"	100 105 002	500 001 085	501 003 010	502 002 002
1/2"	100 105 003	500 001 088	501 004 009	502 002 002
5/8"	100 105 005	500 001 088	501 003 014	502 002 002
3/4"	100 105 006	500 001 091	501 003 015	502 002 003

*502 022 045 or 502 002 046 Split Feet used with Standard Duty Guns
502 002 001 or 502 002 002 Split Feet used with Heavy Duty Guns



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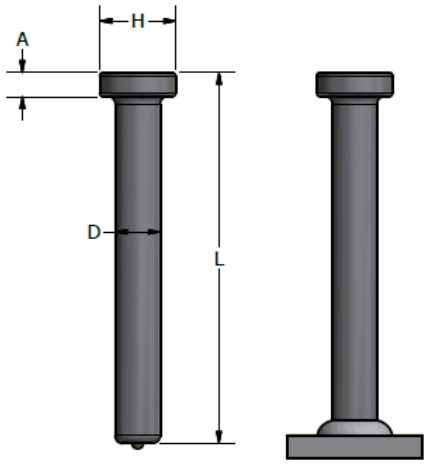
Nelson Stud Specification

Headed Anchors

S3L Shear Connectors

Nelson headed shear connectors deliver code specified shear strength values as used in composite construction, securing concrete to steel structural components. Nelson shear connectors meet requirements of the following codes:

- AWS D1.1 Structural Welding Code – Steel, Type B
- AWS D1.6 Structural Welding Code – Stainless Steel, Type A
- AASHTO/AWS D1.5 Bridge Welding Code, Type B
- AASHTO Standard Specification for Highway Bridges
- ISO-13918 Welding – Studs for Arc Stud Welding
- Canadian Standards Association, W59 – Welded Steel Construction, Type B
- International Building Code Section 19
- AISC Manual of Steel Construction – Allowable Stress Design
- AISC Manual of Steel Construction – Load & Resistance Factor



See also: ICC-ES Evaluation Report ESR-2856 Nelson Shear Connector Studs

Shear connectors are typically used in composite steel construction for holding concrete slabs to steel members to resist shear forces and increase shear loading capacity in steel buildings, bridges, columns caissons, containment liners, etc. They also act as embedment anchors on miscellaneous embedded plates, frames, angles, strip plates, attachments and connections. Options for Welding Through Metal Deck are available for 3/4" diameter and smaller.

For similar function studs, see Nelson H4L Headed Concrete Anchors and D2L Deformed Bar Anchors.

Stud Diameter D	Burn Off*	A	H	Required Standard Accessories			
				Chuck	Foot	Ferrule Holder	Ferrule for Flat
3/4"	0.187	0.375	1.250	500 001 088	502 002 042	501 006 027	100 101 152
7/8"	0.187	0.375	1.375	500 001 091	502 002 042	501 006 028	100 101 140
1"	0.250	0.500	1.625	500 001 424	502 002 042	501 006 046	100 101 045
Metric							
19	2.00	4.70	4.00	500 001 088	502 002 042	501 006 027	100 101 152
22	3.00	6.20	4.50	500 001 091	502 002 042	501 006 028	100 101 140
25	3.00	7.90	5.00	500 001 424	502 002 042	501 006 046	100 101 045

*Burn Off**:** Burn off lengths shown are for welding to bare steel. For burn off values and other details when studs are welded through metal deck to steel see **WELD THROUGH DECK SPECIFICATION SHEET**

MATERIALS: Studs are available in Low Carbon Mild Steel (ASTM A29, ASTM A108, AASHTO M169) and 316L Stainless Steel. For specific grade information and physical and chemical properties, and conforming standards, please see General Material Specifications. Certified Material Test Reports (CMTR) and Certificates of Compliance (COC) are available and must be requested at time of order.

For ferrules and grips used for welding through metal decking at an angle to plate, welding into angles, and welding to a vertical base plate, see the Special Applications section of the Ferrule Specifications.

FLUX: All Nelson concrete anchors have a solid flux load

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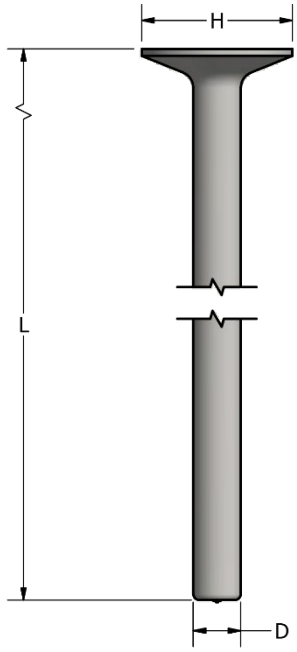
Nelson Stud Specification

Headed Anchors

PSRS Punching Shear Resistor

Nelson punching shear resistor studs (PSRS) are specifically designed to be stud welded to a flat steel rail to provide a strong, ductile reinforcing system to prevent punching shear where columns punch through concrete cast in place, floor, and foundation slabs. Nelson punching shear resistor studs meet requirements of the following codes:

- AWS D1.1 Structural Welding Code – Steel, Type B
- ISO-13918 Welding – Studs for Arc Stud Welding
- Canadian Standards Association, W59 – Welded Steel Construction, Type B
- Canadian Standards Association, CSA A23.3 – Design of Concrete Structures
- ACI 318 – Building Code Requirements for Structural Concrete
- ACI TCR 421.1R99 Shear Reinforcement for Slabs
- ASTM A1044 – Steel Stud Assemblies for Shear Reinforcement of Concrete



Punching shear resistor studs feature a head area 10 times the stud shank area. Due to the size of the head, the use of side grip chucks is recommended to better secure the stud during welding.

For similar function studs, see Nelson H4L Headed Concrete Anchors, S3L Shear Connectors, D2L Deformed Bar Anchors.

Stud Diameter D	Burn Off	A	H	Recommended Standard Accessories					
				Side-Grip Chuck[1,2] Assembly	Foot Adaptor Bar[3] †	Leg Bracket[3]	Foot ‡	Ferrule Holder	Ferrule for Flat
3/8”	0.125 / 3mm	0.210	1.190	500 014 280	--	--	503 000 000	501 003 022	100 101 099
1/2”	0.125 / 3mm	0.280	1.580	500 014 281	--	--	503 000 000	501 003 021	100 101 114
5/8”	0.187 / 4mm	0.350	1.980	500 014 282	502 001 330	502 001 329	503 000 000	501 003 019	100 101 187
3/4"	0.187 / 4mm	0.420	2.370	500 014 283	502 001 330	502 001 329	503 000 000	501 003 019	100 101 152

[1] Multiple alternate side grip chuck designs are available. Contact your local Nelson representative for additional information
[2] All chucks need to be mounted on Angle Bracket #500-014-270. One or two chucks can be installed on this angle bracket
[3] To weld 5/8" and 3/4" PSRS, Foot Adaptor Bar and Leg Bracket are needed to prevent the heads from contacting the legs
†For studs over 11" in length, the 512-193-600 3-leg tube extension kit is recommended with the appropriate length tube
‡ Foot 503-000-000 is a large split bipod foot. Foot 502-002-005 is a large split standard foot

MATERIALS: Studs are available in Low Carbon Mild Steel (ASTM A29, ASTM A108, AASHTO M169). For specific grade information and physical and chemical properties, and conforming standards, please see General Material Specifications. Certified Material Test Reports (CMTR) and Certificates of Compliance (COC) are available and must be requested at time of order.

FLUX: All Nelson punching shear resistor studs have a solid flux load

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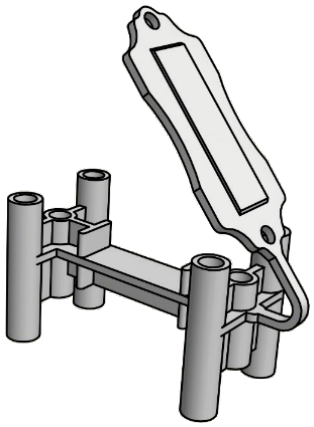
Nelson Stud Specification

Headed Anchors

PSRS Chairs

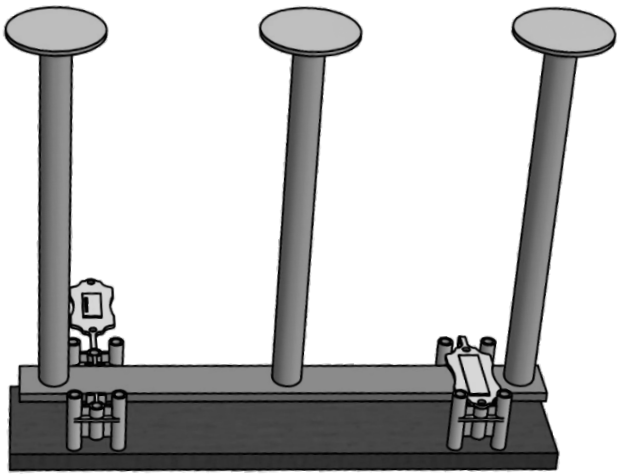
To aid in the installation of Punching Shear Resistor Stud Rails Nelson offers plastic chairs. Chairs are nailed into wooden form work and once installed hold the PSR stud rail at the specified elevation within concrete slabs. Chairs are available to meet the designed clearance and cover shown per construction plans.



PSRS Chairs	
Clear Cover	**Part Number**
3/4" (19mm)	102 309 003
1" (22mm)	102 309 008*

*The 1" Chair can be installed upside down to get 1 1/4" of cover

MATERIALS: Plastic



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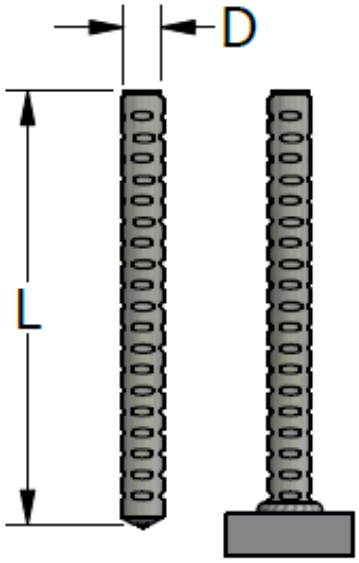
Nelson Stud Specification

Concrete Anchorage



D2L Deformed Bar Anchors

Nelson deformed bar anchors deliver full tension capacity when embedded according to code requirements and provide specified shear strength when embedded at proper edge distances and spacing between bars. Nelson deformed bar anchors are used for deep embedment anchors in such applications as precast columns, tee and beam connections, seismic shear walls and securing steelplates to concrete structures. Nelson deformed bars meet requirements of the followingcodes:

- AWS D1.1 Structural Welding Code - Steel, Type C
- ASTM A1064 (Previously A496) Steel Wire, Deformed, For Concrete Reinforcement
- Precast/Pre-stressed Concrete Institute Design Handbook
- Canadian Standards Association, CWB W59 - Welded Steel Construction, Type C
- International Building Code Section 19 See ICC-ES Evaluation Report ESR-2907

For similar function studs, see Nelson B4L Reinforcing Standoff Support studs, H4L Headed Concrete Anchors, J2L "J" Bolt studs, and S3L Shear Connectors.

Stud Diameter D	Burn Off*	Required Standard Accessories			
		Chuck	Grip	Ferrule	Foot
3/8"	0.125	500 001 011	501 003 009	100 101 099	502 002 001*
1/2"	0.125	500 001 014	501 003 010	100 101 114	502 002 002*
5/8"	0.187	500 001 016	501 003 014	100 101 187	502 002 002*
3/4"	0.187	500 001 018	501 003 019	100 101 152	502 002 009
7/8"					
Metric					
10	3.00	500 001 011	501 003 009	100 101 099	502 002 001*
13	3.00	500 001 014	501 003 010	100 101 114	502 002 002*
16	4.00	500 001 016	501 003 014	100 101 187	502 002 002*
19	4.00	500 001 018	501 003 019	100 101 152	502 002 009
22					

*Feet 502 002 001 and 502 002 002 are used with Nelson's heavy-duty gun. Feet 502 002 045 and 502 002 046 are used with Nelson's standard duty gun.

MATERIALS: Studs are available in Low Carbon Mild Steel. For specific grade information and physical and chemical properties, and conforming standards, please see General Material Specifications. Certified Material Test Reports (CMTR) and Certificates of Compliance (COC) are available and must be requested at time of order.

For special ferrules and grips used in welding at an angle to plate, welding to angles, and welding to a vertical base plate, see the Special Applications section of the Ferrule Specifications.

FLUX: All Nelson deformed bar anchors have a solid flux load.

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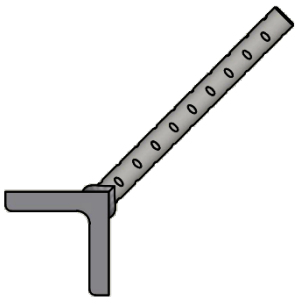
Nelson Stud Specification

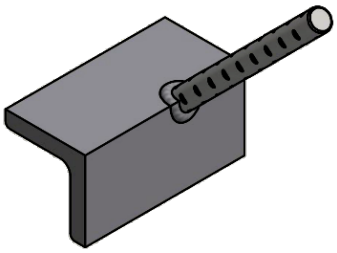
Concrete Anchorage

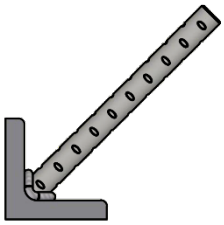
D2L Deformed Bar Anchors

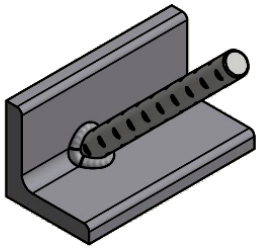
Nelson deformed bar anchors are designed to be welded to a variety of structural steel shapes. D2L studs are commonly used in concrete slab closures, precast concrete manufacturing as anchorage for steel embedments.

For welding into the fillet or onto the heel of an angle it is important that the studs are long enough to provide adequate anchorage length for concrete.









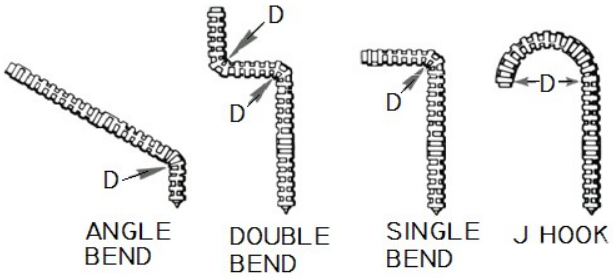
Ferrule and Accessories for welding studs in fillet of angles/structural shapes					
Stud Dia.	**Ferrule**	**Fillet Radius**	**Chuck**	**Grip**	**Foot***
3/8"	100 106 002	0.250	500 001 018	501 004 006	502 002 001
1/2"	100 103 009	0.250	500 001 085	501 004 008	502 002 001
1/2"	100 103 011	0.375		501 004 008	
5/8"	100 106 005	0.375	500 001 088	501 004 009	502 002 002
5/8"				501 008 010	
3/4"	100 106 004	0.375	500 001 088	501 004 014	502 002 002
3/4"	100 103 012	0.750	500 001 088	501 004 014	502 002 002

*502 022 045 or 502 002 046 Split Feet used with Standard Duty Guns

* 502 002 001 or 502 002 002 Split Feet used with Heavy Duty Guns

Ferrule and Accessories for welding studs to heel of angles/structural shapes				
Stud Dia.	**Ferrule**	**Chuck**	**Grip**	**Foot***
3/8"	100 105 001	500 001 011	501 003 008	502 002 001
1/2"	100 105 002	500 001 014	501 003 010	502 002 002
5/8"	100 105 003	500 001 016	501 003 010	502 002 002
3/4"	100 105 005	500 001 018	501 003 014	502 002 002

Nelson deformed bar anchors are also available in a variety of bent configurations manufactured to meet customer specifications. Please inquire with your local Nelson representative about availability. Specify bend radius, type of bend and leg length.



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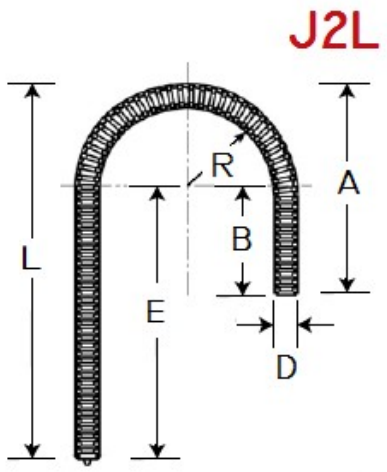
Nelson Stud Specification

Concrete Anchorage

J2L "J" Bolt Studs

Nelson J2L (and J2P, 3/16" diameter) studs are welded to parts, assemblies, and structures to act as an attachment or lifting point. They may be embedded in concrete to provide anchorage or may be used as locators for reinforcing bars in concrete structures.



Special chucks that fit the curve of the "J" are made to weld these studs. The chucks shown are for studs with the minimum radius J bend. If the length, "E", is more than 4", then side-gripping chucks can be used. The weight surface of the J2L deformed bar anchor studs is better gripped by the two ball detents and lever screw of the side gripping chucks which are mounted on angle bracket #528-001-098.

The foot plates or split feet/grip combinations shown can be used to weld J2L studs. Please see the NBL type specification sheet for the weld burn off and weld flash dimensions of Nelson J2L and J2P studs.

Stud types that may perform a similar function to the J2L "J" Bolt studs are Nelson B4L Reinforcing Standoff Support studs, E2L "Eyebolt" studs, R7P Rectangular Stud with Hole, and R9L Rope Hook studs.

Stud Diameter	Min L	Min A	Min B	Min E	Minimum R	Required Standard Accessories		
						Chuck for Min Radius	Ferrule	Plate Foot Assembly
1/4	1.187	1.062	0.500	0.625	0.312	500 012 002	100 101 067	501 006 003
3/8	1.562	1.312	0.500	0.750	0.437	500 012 008	100 101 099	501 006 005
7/6	1.750	1.437	0.500	0.812	0.500	500 012 011	100 101 009	501 006004
1/2	1.937	1.500	0.500	0.937	0.500	500 012 005	100 101 114	501 006 007
5/8	2.437	1.875	0.500	1.062	0.750	500 012 001	100 101 187	501 006 008
3/4	3.250	2.750	1.000	1.000	1.000	See Side Gripping	100 101 152	501 006 008

MATERIALS: Studs are available in Low Carbon Mild Steel (with or without deformations), high strength deformed steel bars meeting ASTM A1064 and 18-8 Stainless Steel. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

FLUX: All standard Nelson J2L "J" Bolt studs have a solid flux load

Stud	Chuck Assembly	Body Only
1/4	500 014 103	500 014 100
3/8	500 014 102	500 014 099
1/2	500 014 095	500 014 092
5/8	500 014 096	500 014 093
3/4	500 014 097	500 014 094

Side Gripping Chucks (for J2L or D2L with large radius)

American Concrete Institute ACI 318 calls for the following minimum radiuses in 180° bent hooks:

Bar Diameter	Hook - 6 x D Radius - Diameter
#3 - 3/8"	1-1/8" - 2-1/2"
#4 - 1/2"	1-1/2" - 3"
#5 - 5/8"	1-7/8" - 3-3/4"
#6 - 3/4"	2-1/4" - 4-1/2"

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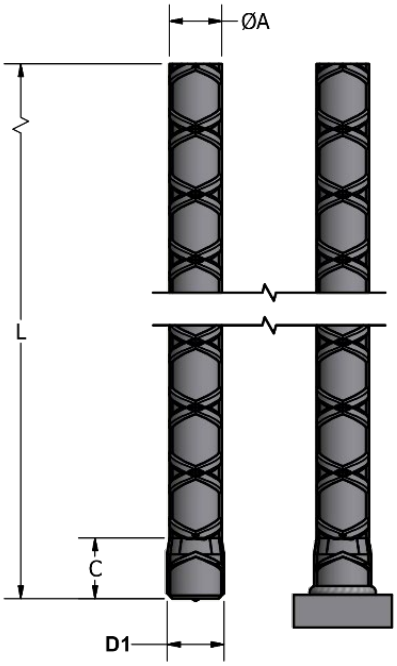
Nelson Stud Specification

Concrete Anchorage

D6L – Rebar Studs

Nelson D6L Rebar Studs are manufactured from ASTM A706 Grade 60 rebar steel and feature a patented weld end geometry. The welded stud is able develop its full strength and elongation properties without employing the preheat typically required when welding rebar steel with the manual arc welding processes featured in AWS D1.4. All Nelson Rebar Studs offered by Nelson are backed by a Manufacturer's Stud Base Qualification as governed by AWS D1.1 for drawn arc stud welding.



Nelson Rebar Stud anchors are used in applications that require ductile connections, such as; earthquake-resistant concrete structures, precast concrete connections, seismic shear walls and securing steel plates to concrete structures.

The Nelson rebar studs meet requirements of the following codes:

- AWS D1.1, Structural Welding Code - Steel
- ASTM A706, Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
- ACI 318, Building Code Requirements for Structural Concrete
- ASTM A970, Headed Steel Bars for Concrete Reinforcement
- PCI Design Handbook, Precast and Pre-stressed Concrete

Nelson rebar studs are also available in a variety of bent configurations manufactured to meet customer specifications. Please inquire with your local Nelson representative about availability. Specify bend radius, type of bend and leg length.

For similar function studs, see Nelson H4L Headed Concrete Anchors, S3L Shear Connectors, D2L Deformed Bar Anchors, J2L J-Bolt Studs.

Nominal Stud Diameter A	Burn Off	D1	C	Required Standard Accessories			
				Chuck	Grip	Ferrule	Foot
3/8" (#3)	0.125	0.431	0.500			100 101 038	
1/2" (#4)	0.187	0.575	0.625	500 001 544	501 006 027	100 101 187	502 002 042
5/8" (#5)	0.187	0.707	0.750	500 001 545	501 006 027	100 101 152	502 002 042
3/4" (#6)	0.187	0.880	0.875	500 001 546	501 006 028	100 101 140	502 002 042

MATERIALS: Studs are available in ASTM A706 Grade 60. Certified Material Test Reports (CMTR) and Certificates of Compliance (COC) are available and must be requested at time of order.

FLUX: All Nelson D6L rebar studs have a solid flux load

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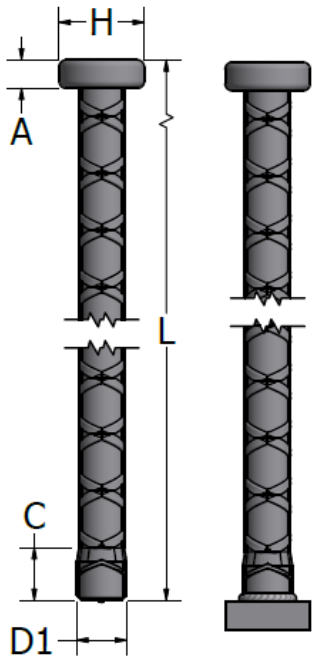
Nelson Stud Specification

Concrete Anchorage



H6L – Headed Rebar Stud

Nelson H6L Headed Rebar Studs are manufactured from ASTM A706 Grade 60 rebar steel and consist of a headed end opposite of the patented weld end geometry present on all Nelson Rebar studs. The H6L Rebar Stud features a head with a net bearing area of a minimum of four times (4x) the nominal cross-sectional area of the bar.

The headed rebar studs are utilized as embedment anchors to develop steel reinforcement bars in tension as an alternative to using standard hooks or development lengths of straight bars. Nelson headed rebar anchors are used in applications such as; precast columns, tee and beam connections, seismic shear walls and securing steel plates to concrete structures.

The Nelson rebar studs meet requirements of the following codes:

- AWS D1.1, Structural Welding Code - Steel
- ASTM A706, Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
- ACI 318, Building Code Requirements for Structural Concrete
- ASTM A970, Headed Steel Bars for Concrete Reinforcement
- PCI Design Handbook, Precast and Pre-stressed Concrete

All Nelson Rebar Studs offered by Nelson are backed by a Manufacturer's Stud Base Qualification as governed by AWS D1.1 for drawn arc stud welding.

For similar function studs, see Nelson D6L Rebar Studs, H4L Headed Concrete Anchors, S3L Shear Connectors, D2L Deformed Bar Anchors.

Nominal Stud Diameter D	Burn Off	D1	C	A	H	Required Standard Accessories			
						Chuck	Grip	Ferrule	Foot
3/8" (#3)	0.125	0.431	0.500	0.296	0.880			100 101 038	
1/2" (#4)	0.187	0.575	0.625	0.296	1.140			100 101 187	502 002 042
5/8" (#5)	0.187	0.707	0.750	0.296	1.420			100 101 152	502 002 042
3/4" (#6)	0.187	0.880	0.875	0.390	1.690			100 101 140	502 002 042

MATERIALS: Studs are available in ASTM A706 Grade 60. Certified Material Test Reports (CMTR) and Certificates of Compliance (COC) are available and must be requested at time of order.

FLUX: All Nelson D6L rebar studs have a solid flux load

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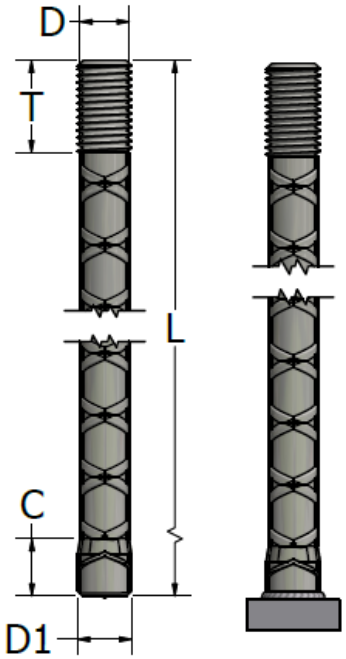
Nelson Stud Specification

Concrete Anchorage



C6L – Threaded Rebar Stud

Nelson C6L Threaded Rebar Studs are manufactured from ASTM A706 Grade 60 rebar steel and feature a threaded end opposite of the patented weld end geometry. Nelson C6L Threaded Studs can be used to eliminate lap splicing in longitudinal reinforcement and provide reinforcement anchorage to structural members.

Nelson C6L Threaded Rebar Stud anchors are used for embedment anchorages requiring mechanical connections such as splices, to reduce rebar congestion by eliminating lap splices, and others that require ductile concrete reinforcement.

The Nelson rebar studs meet requirements of the following codes:

- AWS D1.1, Structural Welding Code - Steel
- ASTM A706, Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
- ACI 318, Building Code Requirements for Structural Concrete
- ASTM A970, Headed Steel Bars for Concrete Reinforcement
- PCI Design Handbook, Precast and Pre-stressed Concrete

All Nelson Rebar Studs offered by Nelson are backed by a Manufacturer's Stud Base Qualification as governed by AWS D1.1 for drawn arc stud welding.

For similar function studs, see Nelson D6L Rebar Studs, CPL Partially Threaded Studs, D2L Deformed Bar Anchors.

Nominal Stud Diameter D	Burn Off	D1	C	T Thread	Thread Length	Required Standard Accessories			
						Chuck	Grip	Ferrule	Foot
3/8" (#3)	0.125	0.431	0.500	1/2-13	2.000			100 101 038	
1/2" (#4)	0.187	0.575	0.625	5/8-11	2.000	500 001 544	501 006 027	100 101 187	502 002 042
5/8" (#5)	0.187	0.707	0.750	3/4-10	2.000	500 001 545	501 006 027	100 101 152	502 002 042
3/4" (#6)	0.187	0.880	0.875	7/8-9	2.000	500 001 546	501 006 028	100 101 140	502 002 042

MATERIALS: Studs are available in ASTM A706 Grade 60. Certified Material Test Reports (CMTR) and Certificates of Compliance (COC) are available and must be requested at time of order.

FLUX: All Nelson D6L rebar studs have a solid flux load

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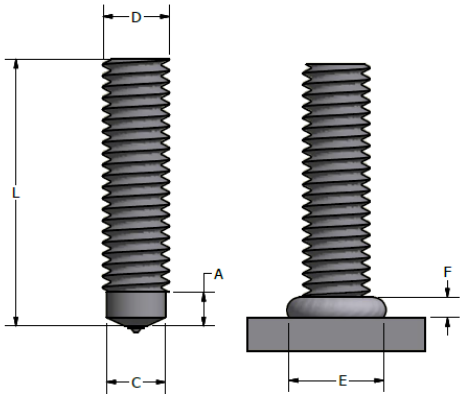
Nelson Stud Specification

Externally Threaded

CFL, MD - Fully Threaded Studs

Nelson CFL studs are recommended for fastening applications where threads are needed for the full fastener length. CFL studs are available in thread diameters of 1/4"-20 through 1”-8 (M6 through M24). Nelson fully threaded studs have a short length of pitch diameter weld base. This length is melted off during the stud welding process so that usable thread extends down to the top of the weld flash on installed studs.



For similar function studs, see CFP Small Diameter Threaded studs, CJL Reduced Base studs, CPL Partially Threaded Studs, HBA Aluminum Full Base Diameter Threaded studs, HBL Full Base Diameter Threaded Studs, Banding Cable Hangers, CrimpLok™ Cable Hangers, and Watertight nuts.

Thread Size	Min. Stud Length	Burn Off	Weld Base Diameter	Weld Base Length	Weld Flash Size		Min. Hole Diameter	Required Standard Accessories			
D	L		C	A	E	F		Ferrule	Grip	Chuck	Foot
1/4-20	0.780	0.125	0.215	0.142	0.359	0.109	0.437	100 101 067	501 001 007	500 001 007	502 001 137
5/16-18	0.780	0.125	0.275	0.142	0.437	0.109	0.500	100 101 024	501 001 006	500 001 009	502 001 137
3/8-16	0.812	0.125	0.330	0.190	0.500	0.125	0.562	100 101 025	501 001 007	500 001 011	502 001 137
7/16-14	0.812	0.125	0.389	0.205	0.562	0.125	0.625	100 101 026	501 001 008	500 001 012	502 001 137
1/2-13	0.875	0.125	0.448	0.221	0.625	0.156	0.680	100 101 027	501 001 009	500 001 014	502 001 137
9/16-12	1.625	0.187	0.503	0.221	0.750	0.156	0.813	100 101 011	501 001 011	500 001 015	502 001 138
5/8-11	1.000	0.187	0.562	0.284	0.781	0.187	0.843	100 101 028	501 001 011	500 001 016	502 001 138
3/4-10	1.250	0.187	0.680	0.346	0.937	0.250	1.031	100 101 029	501 001 014	500 001 018	502 001 002
7/8-9	1.500	0.187	0.798	0.377	1.125	0.312	1.250	100 101 140	501 001 015	500 001 019	502 001 003
1-8	1.500	0.250	0.913	0.500	1.375	0.375	1.437	100 101 045	501 001 016	500 001 085	502 001 003
Metric											
M5 x 0.80	15.00	2.00	4.40	4.00	7.90	2.50	9.50	100 101 034	501 001 005	500 001 427	502 001 137
M6 x 1.00	20.00	2.00	5.30	4.00	9.10	3.00	11.10	100 101 067	501 001 007	500 001 267	502 001 137
M8 x 1.25	20.00	3.00	7.10	4.00	11.00	3.50	12.70	100 101 024	501 001 006	500 001 009	502 001 137
M10 x 1.50	22.00	3.00	8.99	5.00	12.30	4.00	13.90	100 101 240	501 001 008	500 001 269	502 001 137
M12 x 1.75	22.00	3.00	10.80	6.00	16.00	4.50	17.50	100 101 027	501 001 009	500 001 206	502 001 137
M16 x 2.00	27.00	4.00	14.60	6.00	20.50	7.00	22.00	100 101 028	501 001 011	500 001 016	502 001 002
M20 x 2.50	30.00	5.00	18.30	7.00	26.00	9.00	27.50	100 101 238	501 001 014	500 001 272	502 001 002
M24 x 3.00	38.00	6.00	22.00	8.00	35.00	10.00	36.50	100 101 045	501 001 016	500 001 085	502 001 003

MATERIALS: Studs are available in Low Carbon Mild Steel and Stainless Steel. For specific grade information, physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications. Nelson studs conform to AWS D1.1, TS 16949 and ISO 13918. Other alloys can be special ordered.

THREADS: Standard CFL studs are available with up to 3” of thread length in UNC-2A coarse thread. Other thread pitch series, and thread lengths greater than 3” are available as special order. Standard MD studs are available with up to 75mm of thread length in ISO 13918 6g series thread. Other thread pitch series, and thread lengths greater than 75mm are available as special order.

FLUX: All Nelson fully threaded CFL studs have a solid flux load.

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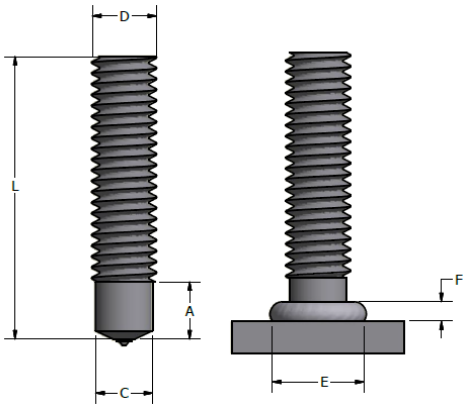
Nelson Stud Specification

Externally Threaded



CPL, MP - Partially Threaded Studs

Nelson partially threaded studs are recommended for fastening applications to heavy gauge base materials where development of the full fastener strength is needed. The unthreaded section minimizes the weld flash diameter and height. It also reduces the possibility of stud hang up in the ferrule cavity if gun parts are slightly misaligned.

Nelson partially threaded studs have a pitch diameter weld base and are available in thread diameters of 1/4-20 through 1-8 (M6 through M24) with unlimited length.

Nelson studs are certified to AWS D1.1, TS16949, and ISO 13918.

For similar function studs, see Nelson CFL Full Threaded studs, CFP Small Diameter Threaded studs, CJL Reduced Base studs, HBL Full Base Diameter Threaded studs, B5L 90° Bent Collar studs, Banding Cable Hangers, CrimpLok™ Cable Hangers, and Watertight nuts.

Thread Size	Min. Stud Length	Burn Off	Weld Base Diameter	Weld Base Length	Weld Flash Size		Min. Hole Diameter	Required Standard Accessories			
D	L		C	A	E	F		Ferrule	Grip	Chuck	Foot
1/4-20	0.562	0.125	0.215	0.375	0.312	0.093	0.375	100 101 034	501 001 005	500 001 007	502 001 137
5/16-18	0.593	0.125	0.275	0.375	0.406	0.109	0.469	100 101 035	501 001 006	500 001 009	502 001 137
3/8-16	0.625	0.125	0.330	0.385	0.468	0.109	0.531	100 101 036	501 001 007	500 001 011	502 001 137
7/16-14	0.718	0.125	0.389	0.438	0.531	0.125	0.594	100 101 037	501 001 008	500 001 012	502 001 137
1/2-13	0.843	0.125	0.448	0.500	0.593	0.156	0.656	100 101 038	501 001 009	500 001 014	502 001 137
9/16-12	0.875	0.187	0.503	0.531	0.671	0.171	0.734	100 101 117	501 001 010	500 001 015	502 001 138
5/8-11	1.000	0.187	0.562	0.625	0.750	0.187	0.812	100 101 039	501 001 011	500 001 016	502 001 138
3/4-10	1.250	0.187	0.680	0.791	0.921	0.250	0.984	100 101 040	501 001 014	500 001 018	502 001 002
7/8-9	1.375	0.187	0.798	0.858	1.046	0.312	1.125	100 101 041	501 001 015	500 001 019	502 001 003
1-8	1.500	0.250	0.913	0.926	1.187	0.375	1.250	100 101 042	501 001 016	500 001 085	502 001 003
Metric											
M6 x 1.00	15.00	2.00	5.30	9.50	9.00	2.80	10.00	100 101 034	501 001 005	500 001 267	502 001 137
M8 x 1.25	16.00	3.00	7.10	11.00	9.90	2.80	10.90	100 101 035	501 001 006	500 001 009	502 001 137
M10 x 1.50	16.00	3.00	8.90	11.50	12.50	3.40	13.70	100 101 156	501 001 008	500 001 269	502 001 137
M12 x 1.75	24.00	3.00	10.70	14.00	14.50	4.50	16.00	100 101 032	501 001 009	500 001 206	502 001 137
M16 x 2.0	29.00	4.00	14.60	16.50	17.80	5.80	20.00	100 101 039	501 001 011	500 001 016	502 001 138
M20 x 2.50	35.00	4.00	18.20	19.00	27.00	6.30	28.60	100 101 133	501 001 015	500 001 272	502 001 003
M24 x 3.00	46.00	5.00	21.90	27.00	28.60	8.00	31.80	100 101 140	501 001 015	500 001 085	502 001 003

MATERIALS: Studs are available in Low Carbon Mild Steel and Stainless Steel. For specific grade information, physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications. Other alloys can be special ordered.

THREADS: Standard CPL studs are available with up to 3” of thread length in UNC-2A coarse thread. Standard MP studs are available with up to 75mm of thread length in ISO 13918 6g series thread. Other thread pitch series, and thread lengths greater than 3” (75mm) are available as special order.

FLUX: All Nelson partially threaded CPL studs have a solid flux load.

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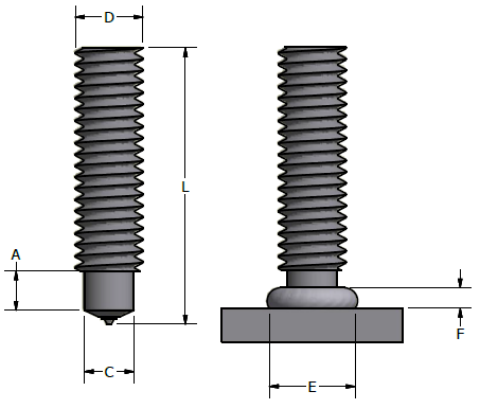
Nelson Stud Specification

Externally Threaded



CJL, MR Reduced Base Studs

Nelson reduced base threaded studs have a smaller weld base diameter than that of Nelson Pitch Diameter MP or CPL studs. When welded these studs produce a smaller weld flash which is compatible with the use of smaller clearance holes. The strength of the assembly is determined by the area of the reduced weld base which is smaller than the thread area.

Nelson Reduced Base Studs conform to AWS D1.1, TS 16949 and ISO 13918.

For similar function studs, see Nelson CFL Fully Threaded studs, CFP Small Diameter Threa HBA Full Base Diameter Aluminum studs, and HBL Full Base Diameter studs.

Thread Size D	Minimum Stud Length L	Burn Off	Weld Base Diameter C	Weld Base Length A	Weld Flash Size		Min. Hole Diameter	Required Standard Accessories			
					E	F		Ferrule	Grip	Chuck	Foot
1/4-20	0.827	0.093	0.187	0.187	0.281	0.093	0.328	100 101 067	501 001 007	500 001 007	502 001 137
5/16-18	0.827	0.093	0.218	0.203	0.343	0.093	0.39	100 101 024	501 001 006	500 001 009	502 001 137
3/8-16	0.827	0.125	0.275	0.218	0.437	0.109	0.469	100 101 025	501 001 007	500 001 011	502 001 137
7/16-14	0.922	0.125	0.343	0.250	0.531	0.125	0.546	100 101 026	501 001 008	500 001 012	502 001 137
1/2-13	0.922	0.125	0.390	0.281	0.548	0.14	0.609	100 101 027	501 001 009	500 001 014	502 001 137
5/8-11	0.968	0.156	0.500	0.312	0.656	0.156	0.718	100 101 028	501 001 011	500 001 016	502 001 138
3/4-10	1.172	0.187	0.625	0.343	0.813	0.187	0.875	100 101 029	501 001 014	500 001 018	502 001 002
7/8-9	1.406	0.187	0.750	0.390	0.937	0.250	1.000	100 101 023	501 001 015	500 001 019	501 001 002
Metric											
M6 x 1.00	17.00	2.00	4.70	4.00	6.70	2.50	8.30	100 101 016	501 001 005	500 001 267	502 001 137
M8 x 1.25	17.00	3.00	6.20	4.50	8.80	2.50	9.90	100 101 017	501 001 006	500 001 009	502 001 137
M10 x 1.50	22.00	3.00	7.90	5.00	11.00	3.00	12.50	100 101 164	501 001 008	500 001 269	502 001 137
M12 x 1.75	25.00	3.00	9.50	6.50	13.00	4.00	14.80	100 101 165	501 001 009	500 001 206	502 001 137
M16 x 2.0	33.00	4.00	13.20	8.00	17.00	5.00	18.20	100 101 021	501 001 011	500 001 016	502 001 002
M20 x 2.50	34.00	5.00	16.50	14.50	21.00	6.00	23.20	100 101 246	501 001 014	500 001 272	502 001 002

MATERIALS: Studs are available in Low Carbon Mild Steel and Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: Standard threads are UNC-2A coarse thread prior to any plating, 3" maximum length. Other threads, and thread lengths greater than 3" are available as special order.

FLUX: All Nelson CJL studs have a solid flux load.

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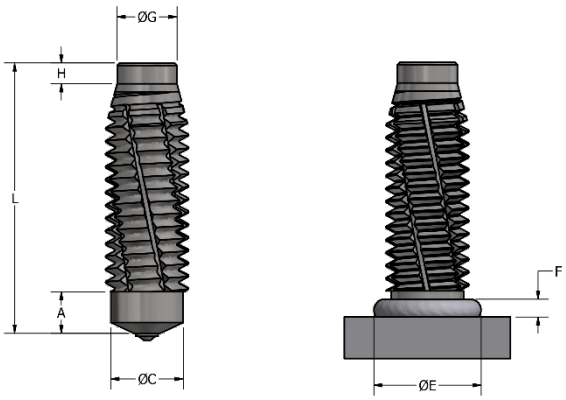
Nelson Stud Specification

Externally Threaded

PFL Paint Groove Studs

PFL paint groove studs feature helical grooves running through the threads axially along the length of the stud. These grooves allow the application of paint without the use of a protective cover, as the bulk of the paint flows down the grooves and does not become trapped in the threads. Subsequent installation of nuts is permitted.

For similar function studs, see Nelson PKL Collared Paint Groove Studs



Thread Size D	Min Length L	Burn Off	C	A	Weld Flash Size		G	H	Flash Clearance	Required Standard Accessories			
					E	F				Ferrule	Grip	Chuck	Foot
1/4-20	0.562	0.125	0.210	0.142	0.359	0.109	0.173	0.125	0.437	100 101 067	501 001 007	500 001 007	502 001 137
5/16-18	0.593	0.125	0.263	0.142	0.437	0.109	0.218	0.125	0.500	100 101 024	501 001 006	500 001 009	502 001 137
3/8-16	0.625	0.125	0.318	0.190	0.500	0.125	0.263	0.125	0.562	100 101 025	501 001 007	500 001 471	502 001 137
1/2-13	0.843	0.125	0.435	0.221	0.625	0.156	0.358	0.125	0.680	100 101 027	501 001 009	500 001 014	502 001 137

M8, M10, and M12 studs are also available

MATERIALS: Studs are available in Low Carbon Mild Steel and Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: Standard threads are UNC-2A coarse thread (WITH GROOVES) prior to any plating.

FLUX: All Nelson PFL studs have a solid flux load.

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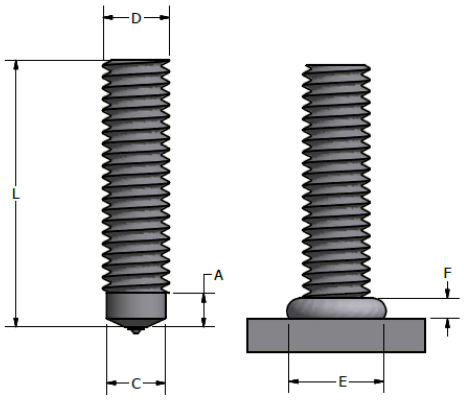
Nelson Stud Specification

Externally Threaded



MPF Threaded Studs

Nelson Metric MPF studs have a short unthreaded weld base such that after welding the usable threads essentially extend down to the weld metal. They are used for fastening applications on heavy gauge base materials where development of the full fastener strength is needed. The short unthreaded section minimizes the weld flash diameter and height. It also reduces the possibility of stud hang up in the ferrule cavity if gun parts are slightly misaligned. Ferrules with a special low profile and large diameter are sued to weld MPF style studs.

Nelson partially threaded studs have a pitch diameter weld base and are available in thread diameters of M6 through M16 with unlimited length.

Nelson MPF studs conform to AWS D1.1, TS16949, and ISO 9000:2000.

For similar function metric studs, see Nelson MD Fully Threaded Metric studs, MP Partially Threaded studs, and MR Reduced Base studs. In the imperial line of Nelson studs, see CFL Full Threaded studs, CFP Small Diameter Threaded studs, CJL Reduced Base studs, HBL Full Base Diameter Threaded studs, B5L 90° Bent Collar studs, Banding Cable Hangers, CrimpLok™ Cable Hangers, and Watertight nuts.

Thread Size D	Min. Stud Length L	Burn Off	Weld Base Diameter C	Weld Base Length A	Weld Flash Size			Required Standard Accessories			
					E	F	Clearance	Ferrule	Grip	Chuck	Foot
M6 x 1.00	17.00	2.00	5.30	3.50	9.00	2.80	10.00	100 101 188	501 001 005	500 001 267	502 001 137
M8 x 1.25	18.00	3.00	7.10	6.90	9.90	2.80	10.90	100 101 209	501 001 008	500 001 009	502 001 137
M10 x 1.50	18.00	3.00	8.90	8.80	12.50	3.40	13.70	100 101 210	501 001 009	500 001 269	502 001 137
M12 x 1.75	23.00	3.00	10.80	9.00	14.50	4.50	16.00	100 101 211	501 001 011	500 001 206	502 001 137
M16 x 2.0	29.00	4.00	14.60	13.50	17.80	5.80	20.00		501 001 014	500 001 016	502 001 138
M20 x 2.50											
M22 x											

MATERIALS: Studs are available in Low Carbon Mild Steel and Stainless Steel. For specific grade information, physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

THREADS: Standard MPF studs are available in lengths up to 50mm. The threads conform to ISO 13918 6g series.

FLUX: All Nelson threaded MPF studs have a solid flux load.

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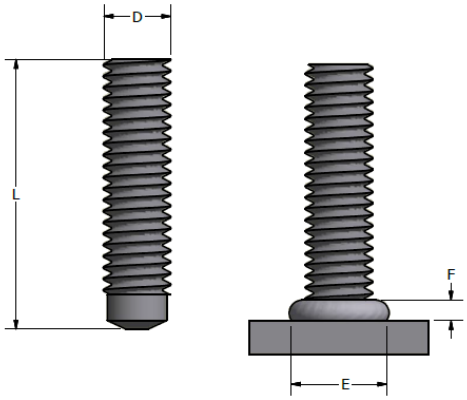
Nelson Stud Specification

Externally Threaded



CFP, CPP, FFP, FPP Small Diameter Threaded Studs

These Nelson threaded stud welding studs, which are less than 1/4" in diameter, are supplied with ceramic ferrules but without the flux loads used in larger diameter studs.

The first letter in the stud type designates the thread series: “C” for coarse threaded studs, “F” for fine threaded studs. The second letter describes the length of the thread or the weld base diameter: “P” for a pitch diameter weld, and “F” for a fully threaded stud. After welding a fully threaded stud, the threads will start at the top of the weld flash. The last letter, “P” indicates that the stud has a pointed weld end as opposed to the flux-loaded weld ends used on larger diameter studs. Flux loaded studs are designated by the letter “L”.

For similar function studs, see Nelson CFL Full Threaded studs, CJL Reduced Base studs, CPL Partially Threaded studs, HBA Aluminum Full Base Threaded Studs, and HBL Full Base Diameter Threaded studs.

Thread Size D	Major Diameter D	Burn Off	Minimum Length	Weld Flash Size		Weld Flash Clearance	Ferrule	Required Standard Accessories		
			L	E	F			Chuck	Ferrule Grip	Foot Assembly
#6-32	0.132	0.062	0.625	0.218	0.093	0.265	100 101 001	500 001 002	501 001 002	502 001 137
#8-32	0.164	0.062	0.625	0.234	0.093	0.281	100 101 002	500 001 006	501 001 003	502 001 137
#10-24	0.187	0.062	0.625	0.281	0.093	0.328	100 101 003	500 001 005	501 001 004	502 001 137
#10-32	0.187	0.062	0.625	0.281	0.093	0.328	100 101 003	500 001 005	501 001 004	502 001 137

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. For specific grade information and physical and chemical properties, and conforming standards, please see General Material Specifications.

THREADS: Standard external threads are UNC-2A, or UNF-2A for #10-32.

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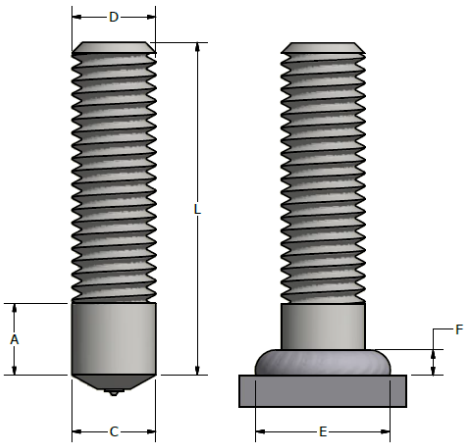
Nelson Stud Specification

Externally Threaded



HBL Full Base Diameter Threaded Studs

Nelson HBL stud are available in thread sizes from #10-24 through 1”-8. The full diameter weld base gives a larger cross-sectional area through the weld zone than on the CPL pitch diameter studs. The increased area is desirable with special stud alloys or when studs are to be welded to specialty base materials.

The HBL studs are more costly than the CPL pitch diameter studs due to the manufacturing steps and material costs involved during manufacturing.

CPL or CFL studs are generally preferred over the HBL studs unless there are technical reasons that specify the need for full base HBL Studs

For similar function studs, see Nelson CFL Fully Threaded studs, CFP Small Diameter Threaded studs, CJL Reduced Base studs, CPL Partially Threaded Studs, CrimpLok™ Cable Hangers, HBA Aluminum Full Base Diameter Threaded studs, and J2L “J” Bolt studs.

Thread Size	Weld Base Diameter	Minimum Unthreaded Length	Minimum Stud Length	Burn Off	Weld Flash Size		Flash Clearance	Required Standard Accessories		
D	C	A	L		E	F		Ferrule	Grip	Chuck
#10-24	0.188	0.187	0.780	0.093	0.281	0.093	0.328	100 101 003	501 001 004	500 001 005
1/4-20	0.250	0.187	0.780	0.125	0.359	0.109	0.437	100 101 067	501 001 007	500 001 007
5/16-18	0.312	0.250	0.780	0.125	0.437	0.109	0.500	100 101 007	501 001 006	500 001 009
3/8-16	0.375	0.265	0.813	0.125	0.500	0.125	0.593	100 101 099	501 001 009	500 001 011
7/16-14	0.438	0.281	0.813	0.125	0.593	0.140	0.656	100 101 009	501 001 008	500 001 012
1/2-13	0.500	0.296	0.968	0.187	0.687	0.156	0.750	100 101 114	501 001 011	500 001 014
5/8-11	0.625	0.359	1.000	0.187	0.875	0.187	0.937	100 101 187	501 001 014	500 001 016
3/4-10	0.750	0.500	1.250	0.187	1.062	0.250	1.125	100 101 152	501 001 014	500 001 018
7/8-9	0.875	0.625	1.500	0.187	1.125	0.312	1.250	100 101 140	501 001 015	500 001 019
1-8	1.000	0.750	1.647	0.250	1.375	0.375	1.437	100 101 045	501 001 016	500 001 085
1 1/8-7	1.125	1.000	2.000	0.250	1.500	0.375	1.625	100 101 143	501 001 017	500 001 113

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: Standard threads are available up to 3” in length with UNC-2A coarse thread pitch.

FLUX: All Nelson full base diameter threaded studs have a solid flux load

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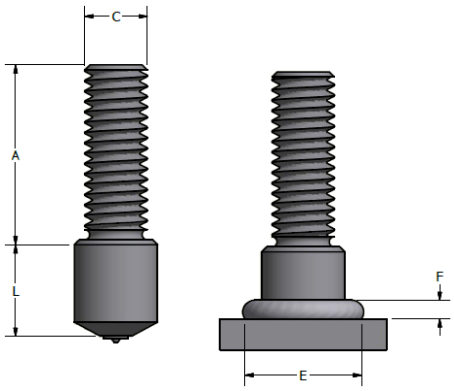
Nelson Stud Specification

Externally Threaded

SBL and VBL Shoulder Studs

Nelson SBL and VBL shoulder studs have weld base diameters that are larger than the diameter of the threaded extensions. They are available with weld base diameters of 1/4” through 1” and threaded extension sizes up to 7/8-9 or 7/8-14.



The Nelson shoulder studs are used as mountings for panels and hardware where a standoff shoulder is needed. SBL studs are similar to CKL collar studs, but the larger weld base provides improved bend resistance.

Both chuck size and part numbers are determined by the thread size, C. Please refer to the Nelson CPL stud specification sheet to find the appropriate chuck for the thread size and part number.

Shoulder studs are also made with fine threads on the extension above the base. Shoulder studs with fine studs are called VBL Shoulder Studs.

Similar function studs are CKL Collar studs and TBL internally tapped studs.

Major Diameter D	Maximum Thread Diameter C	Minimum Length A	Min Length Un-Plated L	Min Length Zinc Plated L	Weld Flash		Required Standard Accessories		
					E	F	Ferrule	Grip	Foot
0.250	#8-32	0.187	0.312	0.500	0.359	0.109	100 101 067	501 001 007	500 001 007
0.312	#10-24	0.250	0.312	0.500	0.437	0.109	100 101 007	501 001 006	500 001 009
0.375	1/4-20	0.250	0.312	0.500	0.500	0.125	100 101 099	501 001 009	500 001 011
0.437	5/16-18	0.312	0.343	0.562	0.593	0.140	100 101 009	501 001 008	500 001 012
0.500	3/8-16	0.375	0.375	0.562	0.687	0.156	100 101 114	501 001 011	500 001 014
0.625	1/2-13	0.500	0.500	0.625	0.875	0.187	100 101 187	501 001 014	500 001 102
0.750	5/8-11	0.562	0.625	0.750	1.062	0.250	100 101 125	501 001 014	500 001 018
0.875	3/4-10	0.625	0.625	0.750	1.125	0.312	100 101 140	501 001 015	500 001 019
1.000	7/8-9	0.750	0.687	0.750	1.375	0.375	100 101 045	501 001 016	500 001 085

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Material selection is dependent on anticipated service temperature range. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: The external threads on SBL studs are UNC-2A. The external threads on VBL studs are UNF-2A.

FLUX: All Nelson SBL and VBL studs have a solid flux load.

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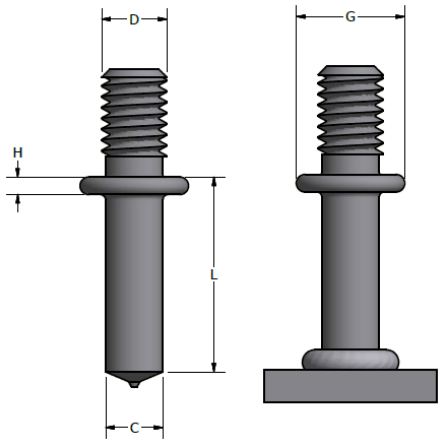
Nelson Stud Specification

Externally Threaded



CKL Collar Studs

CKL collar studs are used for mountings where a stand-off is desired, circuit boards, panels, etc. They are used to retain cables or hoses using a clip. The thread extension speeds assembly over installing a bolt into an internal threaded boss or tapped stud.

The ferrules supplied with CKL studs have gripping neck diameters larger than the collar diameter, G. This allows the gun to strip straight off the welded studs.

For similar function, see Nelson B5L 90° Bent Collar Studs, Banding Cable Hangers, CKA Aluminum Collar studs, CrimpLok™ Cable Hangers, Grounding studs, SBA Aluminum Shoulder Stud, and SBL Shoulder Studs.

Thread Size	Weld Base Diameter	Collar		Min. Base Length	Required Standard Accessories			
D	C	G	H	L	Ferrule	Grip	Chuck	Foot[1]
1/4-20	0.215	0.500	0.093	0.500	100 101 066	501 001 011	500 001 007	502 001 138
5/16-18	0.275	0.562	0.093	0.500	100 101 073	501 001 011	500 001 009	502 001 138
3/8-16	0.330	0.625	0.093	0.500	100 101 083	501 001 011	500 001 011	502 001 138
1/2-13	0.448	0.750	0.093	0.500	100 101 118	501 001 012	500 001 014	502 001 138
Metric								
M6 x 1.00	5.30	13.00	2.50	13.00	100 101 066	501 001 011	500 001 267	502 001 138
M8 x 1.25	7.10	14.00	2.50	13.00	100 101 209	501 001 008	500 001 009	502 001 137
M10 x 1.50	8.90	16.00	2.50	13.00	100 101 210	501 001 009	500 001 269	502 001 137
M12 x 1.75	10.80	19.00	2.50	13.00	100 101 211	501 001 011	500 001 206	502 001 138

[1] Ferrule footplates can be used in place of ferrule grips and feet when welding CKL studs.

Thread Size	Ferrule	Neck Diameter	Foot[1]
1/4-20	100 101 066	0.785	501 006 007
5/16-18	100 101 073	0.785	501 006 007
3/8-16	100 101 083	0.785	501 006 007
1/2-13	100 101 118	0.921	501 006 011
Metric			
M6 x 1.00	100 101 066	0.785	501 006 007
M8 x 1.25	100 101 209	0.585	501 006 004
M10 x 1.50	100 101 210	0.650	501 006 005
M12 x 1.75	100 101 211	0.785	501 006 007

[1] Ferrule footplates can be used in place of ferrule grips and feet when welding CKL studs.

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, and conforming standards, please see General Material Specifications.

THREADS: Standard threads are UNC-2A coarse thread prior to any plating, 3" length. Standard metric studs are available with standard thread length of 10, 12, 16, 20, 25, 30 and 35 mm. in ISO 13918 6g series thread.

FLUX: All Nelson CKL studs have a solid flux load.

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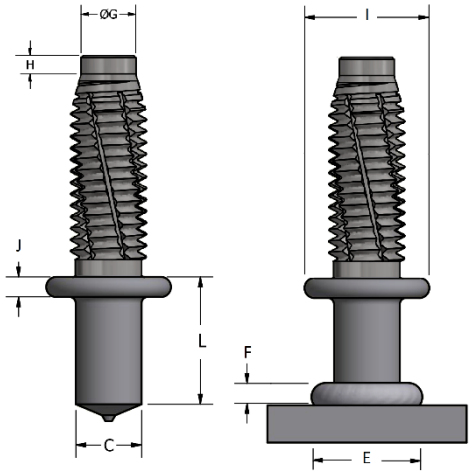
Nelson Stud Specification

Externally Threaded

PKL Collared Paint Groove Studs

PKL collared paint groove studs feature helical grooves running through the threads axially along the length of the stud. These grooves allow the application of paint without the use of a protective cover, as the bulk of the paint flows down the grooves and does not become trapped in the threads. Subsequent installation of nuts is permitted where a stand-off is required.

For similar function studs, see Nelson PFL Paint Groove Studs



Thread Size D	Min Base L	C	Weld Flash Size		G	H	I	J	Required Standard Accessories			
			E	F					Ferrule	Grip	Chuck	Foot
5/16-	0.593	0.263	0.437	0.109	0.218	0.125	0.562	0.093	100 101 073	501 001 011	500 001 009	502 001 138
3/8-16	0.625	0.318	0.500	0.125	0.263	0.125	0.625	0.093	100 101 083	501 001 011	500 001 471	502 001 138

MATERIALS: Studs are available in Low Carbon Mild Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: Standard threads are UNC-2A coarse thread (WITH GROOVES) prior to any plating.

FLUX: All Nelson PKL studs have a solid flux load.

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Nelson Stud Specification

Externally Threaded

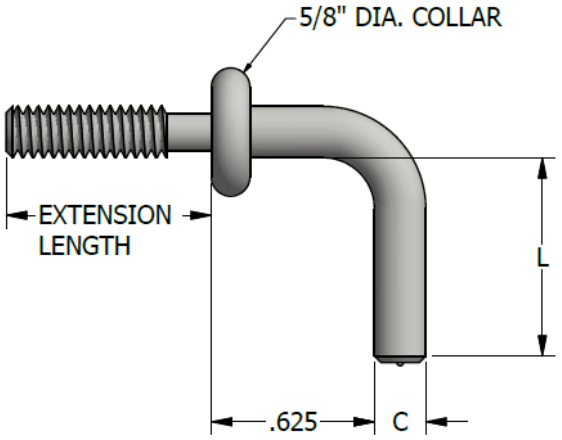
B5L 90° Bent Collar Studs

B5L bent collar studs are used in shipbuilding to mount electrical cable supports to angle or bar downcomers from the ceiling or overhead of ships. They are normally used to attach a cross bar between a pair of downcomers.

Nelson bent collar studs are used in industrial applications to retain cables or hoses using clips. The thread extension speeds assembly over installing a bolt into an internal threaded boss or tapped stud.

A special chuck and foot plate are needed to hold the bent stud and ferrule during the stud welding process.

For similar function studs, see Nelson CKL Collar studs and CPL Partially Threaded studs.



Base[1] C	Minimum Base Length L	Thread Size	Thread Length	Minimum Extension Length	Required Standard Accessories		
					Ferrule	Ferrule Foot Plate	Chuck
0.330	0.625	3/8-16	9/16 – 5/8	0.750	100 101 083	501 006 007	500 009 010

[1] Special bent collar studs are available with full 0.375" diameter weld bases.

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. For specific grade information, physical and chemical properties, and conforming standards, please see General Material Specifications.

THREADS: Standard external threads are UNC-2A.

FLUX: All Nelson B5L studs have a solid flux load.

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Nelson Stud Specification

High Strength

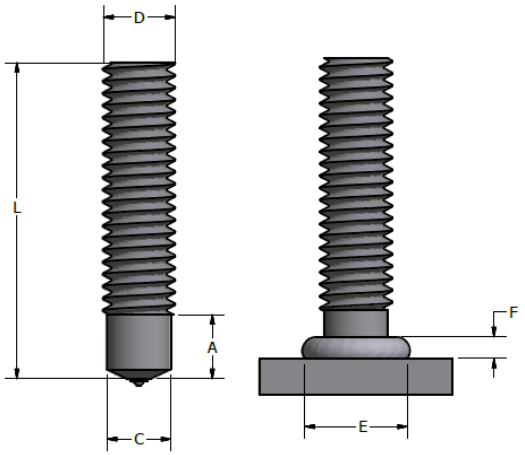
High Strength Pitch Base Studs

Nelson makes stud weldable, high strength studs that do not require heat treating. Consult chart, below, for a comparison of Nelson High Strength studs to SAE Grade 5 and ISO Class 8.8 bolts.

Nelson High Strength studs are available in 3/8-16 and 1/2-13 thread sizes in the CPL/CFL weld base style, and M10 metric MP/MPF weld base style.

The base material to which Nelson High Strength studs are welded must be at least 50,000 psi yield strength in order to develop the full strength of these studs.

Caution: If the High Strength studs are welded to A36 (36,000 psi) structural steel, failure may occur in the base plate at less than full stud strength.



Thread Size D	Minimum Stud Length L	Burn Off	Weld Base Diameter C	Weld Base Length A	Weld Flash Size			Required Standard Accessories			
					E	F	Clearance	Ferrule	Grip	Chuck	Foot
3/8-16	0.625	0.125	0.330	0.385	0.468	0.109	0.531	100 101 036	500 001 011	501 001 007	502 001 137
1/2-13	0.843	0.125	0.448	0.500	0.593	0.156	0.656	100 101 038	500 001 014	501 001 009	502 001 137
M10	16.00	3.00	8.95	11.50	12.50	3.40	14.00	100 101 156	500 001 269	501 001 008	502 001 137

MATERIALS: The physical properties of Nelson High Strength studs are shown below. For specific grade information and physical and chemical properties of other studs, as well as plating options available on these studs, please see General Stud Specifications.

THREADS: Standard threads are available with up to 3” of thread length in UNC-2A coarse thread pitch and ISO R261 6g. Thread lengths greater than 3” are available as special order.

FLUX: All Nelson high strength imperial threaded and metric threaded studs have a solid flux load.

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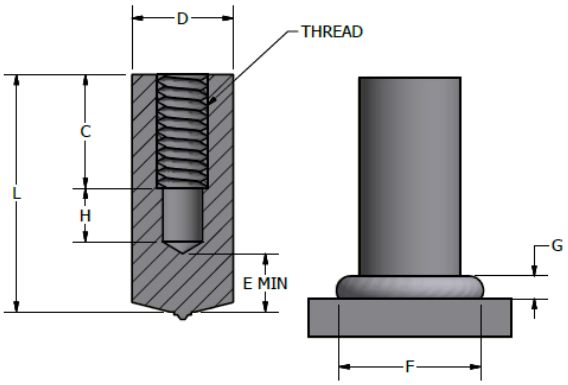
Nelson Stud Specification

Internally Threaded

TBL and PBL Internally Threaded Studs

Nelson's internally threaded TBL and PBL studs are intended to be used on heavy base materials and serve as a means of attaching or anchoring components to a structure. When maximizing the stud diameter to tap ratio, the stud can also serve as a standoff post. Standard TBL studs have internal UNC-2B coarse series threads. Internally tapped studs can also be supplied with UNF-2B fine threads. Studs with fine threads are called PBL studs, rather than TBL studs. The "S" dimension is predicated on stud diameter, not tap size. Secondary bottom tapping or flat bottom drilling is available as a special order with significant price additions. Reduced base studs are available but depth of tap drill point should not pass below shoulder of reduced diameter shoulder so that stud strength is not compromised.



For similar function studs, see Nelson CKL Collar studs, NBL Unthreaded studs, S6L Sprinkler studs, SBL Shoulder studs, and Metric TBL Internally Threaded Studs.

Stud Diameter	Maximum Tap Size	Dimension (Minimums)				Weld Flash Size			Required Standard Accessories			
	T	D	C	H	E	F	G	Clearance	Ferrule	Grip	Chuck	Foot
1/4	#8-32	0.250	0.250	0.125	0.125	0.359	0.109	0.437	100 101 067	501 001 007	500 001 007	502 001 137
5/16	#10-24	0.312	0.281	0.156	0.140	0.437	0.109	0.500	100 101 007	501 001 006	500 001009	502 001 137
3/8	1/4-20	0.375	0.375	0.203	0.140	0.500	0.125	0.593	100 101 099	501 001 009	500 001011	502 001 137
7/16	5/16-18	0.437	0.468	0.234	0.156	0.596	0.140	0.656	100 101 009	501 001 008	500 001012	502 001 137
1/2	3/8-16	0.500	0.562	0.265	0.156	0.687	0.156	0.750	100 101 114	501 001 011	500 001014	502 001 138
9/16	7/16-14	0.562	0.656	0.296	0.187	0.750	0.187	0.812	100 101 039	501 001 011	500 001015	502 001 138
5/8	1/2-13	0.625	0.750	0.319	0.218	0.921	0.187	0.937	100 101 187	501 001 014	500 001016	502 001 138
11/16	9/16-12	0.687	0.843	0.358	0.250	1.062	0.250	0.984	100 101 040	501 001 014	500 001098	502 001 138
3/4	5/8-11	0.750	0.937	0.406	0.250	1.062	0.250	1.125	100 101 152	501 001 014	500 001018	502 001 002
7/8	3/4-10	0.875	1.125	0.453	0.281	1.125	0.312	1.250	100 101 140	501 001 015	500 001019	502 001 002
1	7/8-9	1.000	1.312	0.531	0.312	1.375	0.375	1.437	100 101 045	501 001 016	500 001085	502 001 003
Metric												
6	M4 x 0.70	6	6	3.25	4	9.1	3	11.1	100 101 067	501 001 007	500 001 267	502 001 137
8	M5 x 0.80	8	8	3.75	4	11	4	12.5	100 101 007	501 001 006	500 001 009	502 001 137
10	M6 x 1.00	10	9	4.5	4	13	4	14.5	100 101 037	501 001 008	500 001 269	502 001 137
12	M8 x 1.25	12	12	6	5	16	4.5	17.5	100 101 027	501 001 009	500 001 206	502 001 137
16	M10 x 1.50	16	15	7.75	6	21	6	22.5	100 101 187	501 001 014	500 001 016	502 001 138
19	M12 x 1.75	19	18	9.25	6	7	7	28.5	100 101 152	501 001 014	500 001 018	502 001 002
22	M16 x 2.00	22	24	11.5	7	28	9	30.5	100 101 140	501 001 015	500 001 019	502 001 002

In the table above, **F** represents the height of the weld flash; **I**, the imperfect thread depth; and **S**, the depth of the solid weld base.

MATERIALS: TBL and PBL studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

THREADS: TBL studs have internal UNC-2B coarse threads. PBL studs have internal UNF-2B fine threads.

FLUX: All standard Nelson internally threaded studs have a solid flux load.

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Nelson Stud Specification

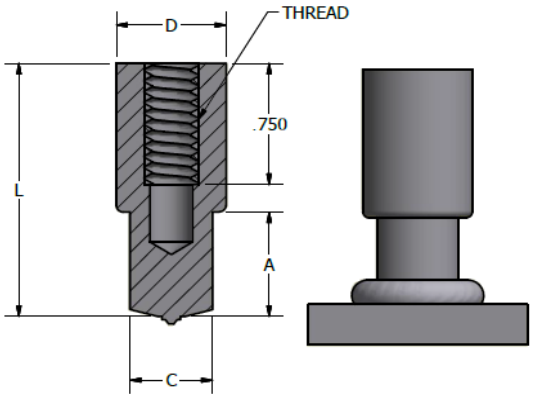
Internally Threaded

S6L Sprinkler Studs

S6L Studs are internally threaded studs with a reduced weld base. They are named for their primary application, which is the attachment of hangers to hold piping for overhead sprinkler systems.

Nelson S6L studs are not solely used for sprinkler systems, and are applicable to many other mounting applications.

For a similar function stud, see Nelson TBL Internally Threaded studs, SBA Aluminum Shoulder studs, and SBL Shoulder studs.



Major Diameter	Weld Base Length	Tap Diameter	Weld Base Diameter	Length	Ferrule	Required Standard Accessories		
D	A	B	C	L		Ferrule Grip	Chuck	Foot
1/2	0.437	3/8-16	0.375	2.000	100 101 031	501 001 008	500 001 014	502 001 137
5/8	0.500	1/2-13	0.437	2.000	100 101 032	501 001 009	500 001 016	502 001 138
3/4	0.687	5/8-11	0.500	2.000	100 101 033	501 001 011	500 001 018	502 001 138
7/8	0.687	3/4-10	0.500	2.000	100 101 119	501 001 012	500 001 019	502 001 138

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: These threads can be internally tapped. Standard internal threads are typically UNC-2B.

FLUX: All Nelson S6L studs have a solid flux load.

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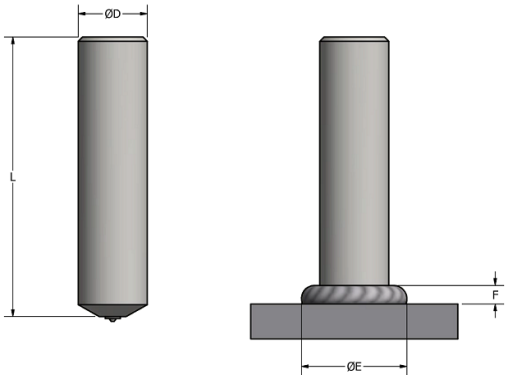
Nelson Stud Specification

Unthreaded

NBL Unthreaded Studs

Nelson NBL studs are designed to be welded to heavy base materials and are used for a variety of applications. They are commonly used as locator pins, axles, pivot points, spacers, and stops. In the power generation market, they are used to anchor refractory to water walls and to facilitate heat transfer in coal burning furnaces. In forging applications, NBL studs are used as the tong hold on the ends of billets. For similar function studs, see Nelson NBA Aluminum Unthreaded studs and NJL Reduced Base Unthreaded studs.



Studs with diameters up to 1/2" (13mm), and lengths up to 1 1/2" (40mm) can be specially designed for use in automatic fed stud welding equipment.

Special secondary operations, such as cross-drilling, grooving, heat treating, and pointing, can expand the application possibilities of Nelson NBL studs

Stud Diameter D	Min. Stud Length L	Burn Off	Weld Flash Size		Min. Hole Diameter	Required Standard Accessories			
			E	F		Ferrule	Grip	Chuck	Foot
1/4	0.780	0.125	0.359	0.109	0.437	100 101 067	501 001 007	500 001 007	502 001 137
5/16	0.780	0.125	0.437	0.109	0.500	100 101 007	501 001 006	500001 009	502 001 137
3/8	0.780	0.125	0.500	0.125	0.593	100 101 099	501 001 009	500 001 011	502 001 137
7/16	0.813	0.125	0.593	0.140	0.656	100 101 009	501 001 008	500 001 012	502 001 137
1/2	0.813	0.125	0.687	0.156	0.750	100 101 114	501 001 011	500 001 014	502 001 138
5/8	0.968	0.187	0.875	0.187	0.937	100 101 187	501 001 014	500 001 016	502 001 002
0.680	1.000	0.187	0.921	0.250	1.125	100 101 040	501 001 014	500 001 245	502 001 002
3/4	1.250	0.187	1.063	0.250	1.125	100 101 152	501 001 014	500 001 018	502 001 002
7/8	1.500	0.187	1.125	0.312	1.250	100 101 140	501 001 015	500 001 019	502 001 003
1	1.647	0.250	1.375	0.375	1.437	100 101 045	501 001 016	500 001 085	502 001 003
Metric									
6	18.00	2.00	9.10	3.00	11.10	100 101 067	501 001 007	500 001 267	502 001 137
8	23.00	3.00	11.00	4.00	12.50	100 101 007	501 001 006	500 001 009	502 001 137
10	23.00	3.00	13.00	4.00	14.50	100 101 037	501 001 008	500 001 269	502 001 137
12	24.00	3.00	16.00	4.50	17.50	100 101 027	501 001 009	500 001 206	502 001 137
16	29.00	4.00	21.00	6.00	22.50	100 101 187	501 001 014	500 001 016	501 001 138
19	30.00	5.00	27.00	7.00	28.50	100 101 152	501 001 014	500 001 018	502 001 002
20	30.00	5.00	26.00	8.00	27.50	100 101 195	501 001 014	500 001 272	502 001 002
22	35.00	6.00	28.00	9.00	30.50	100 101 140	501 001 015	500 001 019	502 001 003
24	36.00	6.00	35.00	10.00	36.50	100 101 197	501 001 016	500 001 274	502 001 003

MATERIALS: Studs are available in Low Carbon Mild Steel and 430 and 300 Series Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

FLUX: All Nelson no thread studs have a solid flux load.

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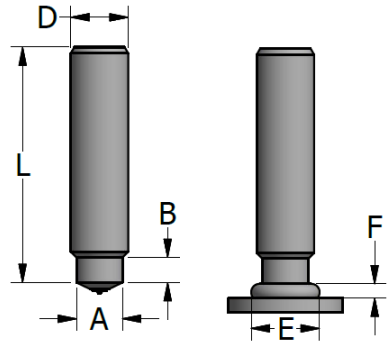
Nelson Stud Specification

Unthreaded



NJL Reduced Base Unthreaded Studs

NJL unthreaded studs have a reduced weld base diameter, A, to produce a smaller weld flash diameter than when the full base Nelson NBL no thread studs are used. The smaller weld flash allows the use of smaller clearance holes. The strength of the assembly is determined by the area of the reduced weld base rather than the thread area.

For similar function studs, see Nelson NBA Unthreaded Aluminum studs and NBL Unthreaded studs.

Stud Diameter	Min. Stud Length	Burn Off	Weld Base		Weld Flash Size		Min. Hole Diameter	Required Standard Accessories			
D	L		A	B	E	F		Ferrule	Grip	Chuck	Foot
1/4	0.827	0.093	0.187	0.187	0.281	0.093	0.437	100 101 016	501 001 005	500 001 007	502 001 137
5/16	0.827	0.093	0.218	0.203	0.343	0.093	0.500	100 101 017	501 001 006	500 001 009	502 001 137
3/8	0.827	0.125	0.275	0.218	0.437	0.109	0.593	100 101 018	501 001 007	500 001 011	502 001 137
7/16	0.922	0.125	0.343	0.250	0.531	0.125	0.656	100 101 019	501 001 008	500 001 016	502 001 137
1/2	0.922	0.125	0.390	0.281	0.548	0.140	0.750	100 101 020	501 001 009	500 001 014	502 001 137
5/8	0.968	0.156	0.500	0.312	0.656	0.156	0.937	100 101 021	501 001 011	500 001 016	502 001 002
3/4	1.172	0.187	0.625	0.343	0.813	0.187	1.125	100 101 022	501 001 012	500 001 018	502 001 002
7/8	1.406	0.187	0.750	0.390	0.937	0.250	1.250		501 001 014	500 001 019	502 001 002

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

FLUX: All Nelson NJL studs have a solid flux load.

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Nelson Stud Specification

Unthreaded

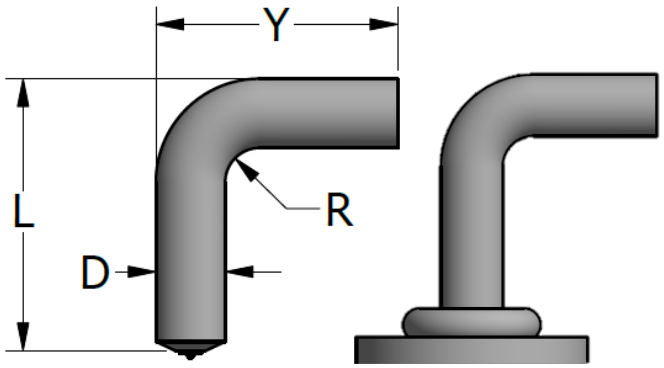
B4L and B4P Reinforcing Standoff Support Studs

Nelson's B4L and B4P studs have a 90° bend and are used for exposed hangars and steps. They are also embedded as anchors or supports for positioning reinforcing bars. The basic stud may be an unthreaded NBL or a deformed bar anchor, D2L.

The stud burn off and weld flash information for these studs is the same diameter as NBL no thread type studs.

These Studs are usually welded using a ferrule footplate or split feet. Grips may be used if the weld leg length, "L", is long enough.

Special chucks are required to hold these studs into the stud welding gun.



Similar studs are the Nelson E2L "Eyebolt" studs, D2L Deformed Bar Anchors, H4L Headed Concrete Anchors, J2L "J" Bolt studs, R6P Rectangular Slotted studs, R9L Rope Hook studs, S3L Shear Connectors, S4X "Y" Anchor studs, and S7X Steerhorn Anchors.

Stud Diameter D	Minimum Length L	Minimum Y	R	Required Standard Accessories		
				Chuck	Ferrule	Foot Plate
1/8	1.000	1.125	0.063	500 008 001	100 101 001	501 006 026
3/16	1.125	1.250	0.125	500 008 004	100 101 003	501 006 010
1/4	1.125	1.312	0.125	500 008 005	100 101 067	501 006 003
5/16	1.250	1.500	0.218	500 008 006	100 101 007	501 006 002
3/8	1.500	1.530	0.218	500 008 007	100 101 099	501 006 005
7/16	1.625	1.625	0.250	500 008 009	100 101 009	501 006 004
1/2	1.750	1.687	0.250	500 008 010	100 101 114	501 006 007
5/8	1.875	2.000	0.312	500 008 012	100 101 187	501 006 008
3/4	2.750	2.812	0.500	500 008 013	100 101 152	501 006 008
7/8	3.375	3.375	0.500	500 008 014	100 101 140	501 006 009

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

FLUX: All Nelson B4L and B4P studs have a solid flux load.

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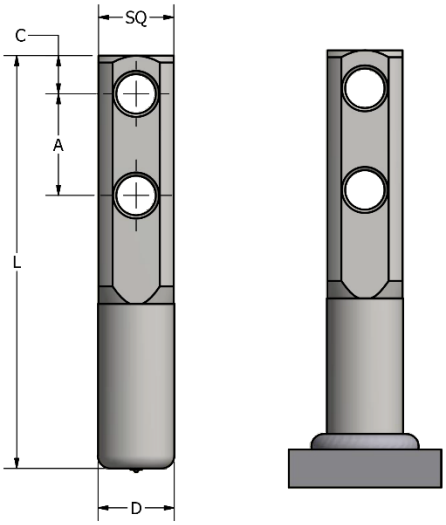
Nelson Stud Specification

Unthreaded

XBL and XXL Round Corner Square Studs

Nelson XBL and XXL Round Corner Square studs are a patented product developed for the installation of hanging overhead wire ways in ships. The round weld base facilitates welding in all positions, while the 3/4” round corner square upper section of the stud and cross-drilled holes provide an attachment point for a variety of mounting hardware. Such hardware may be used to attach cable trays, light fixtures, ducts, and pipes.



The cross bolt holes in Nelson XBL and XXL studs are accessible after 1 or 2 inches of insulation has been installed. This design permits flexibility in construction and repair scheduling, which is not possible when brackets are welded directly to the ship’s structure. The standard holes accommodate 3/8-16 bolts and are spaced 1” apart.

The XBL series of studs have full diameter weld bases, while the XXL studs have reduced weld bases. The smaller XXL 1/2” diameter weld base is used for individual light fixtures and permit welding with smaller power sources.

Longer round corner square studs and different hole diameters and spacing can be applied. Nelson Round Corner Square studs have been shock and vibration tested and are Navy approved.

Type	Base Diameter D	Base Length A	Holes	CFLLength L	Hole to End C	Required Standard Accessories		
						Ferrule	Ferrule Grip	Chuck
XXL	**1/2"**	1.625	1	3.562	0.437	100 101 259	501 001 014	500 007 035
XXL	**1/2"**	2	2	4.062	0.375	100 101 119	501 001 011	500 007 035
XBL	**3/4"**	1.125	2	3.062	0.375	100 101 152	501 001 014	500 007 035

* Ferrule listed…

MATERIALS: Studs are available in Low Carbon Mild Steel. The option for electro-zinc plating coating is available. For specific grade information, physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

FLUX: All Nelson XXL and XBL studs have a solid flux load.

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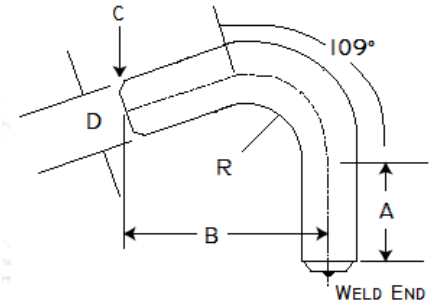
Nelson Stud Specification

Unthreaded

R9L

R9L Rope Hook Studs

Nelson R9L rope hook studs are welded to trucks, trailers, and other vehicles to provide a means of securing tarpaulins with ropes. Because the studs can be rapidly applied, compared to manual welding of J-bent rods, the R9L studs are ideal in situations where large quantities of studs must be applied.



Additionally, Nelson R9L studs can be welded to the perimeter of multistory buildings to facilitate the securing of ropes during building construction. R9L studs meet OSHA regulations for such applications.

Stud types that may perform a similar function to the Nelson R9L studs are Nelson B4L Reinforcing Standoff Support studs, E2L "Eyebolt" studs, J2L "J" Bolt studs, and R7P Rectangular Stud with Hole.

Stud Description	A	B	C	Stud Diameter D	R	Required Standard Accessories		
						Ferrule	Chuck Assembly	Foot Plate
.448 x 3	0.687	1.875	45° x 0.031	0.448	0.500	100 101 118	500 015 111	501 006 011

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

FLUX: All Nelson R9L studs have a solid flux load.

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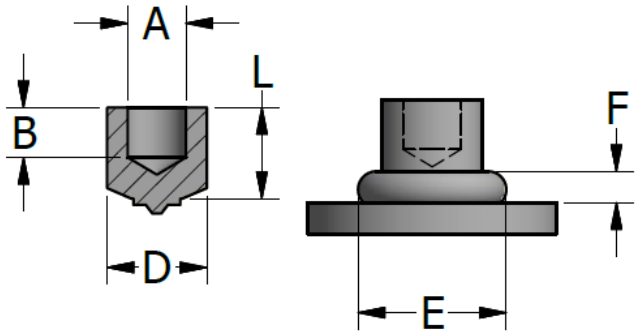
Nelson Stud Specification

Unthreaded

NBL Abrasion Resistant Studs

Nelson NBL AR studs are hollow in the center and manufactured from hardenable alloy steel. They offer superior impact and abrasion resistance when welded in patterns for tunneling, boring, drilling, mining, and crushing equipment. The hollow center and area between the studs become filled with grit that reduces exposure and wear of the underlying base material.

A standard ceramic ferrule is used to weld the NBL AR studs along with a male chuck to fit the hole.



Stud Diameter D	Stud Length L	Burn Off	Hole Diameter A	Hole Depth B	Weld Flash Size		Min. Clearance	Required Standard Accessories			
					E	F		Ferrule	Grip	Chuck	Foot
5/8	0.688	0.187	0.312	0.375	0.875	0.187		100 101 187	501 001 014	500 003 014	502 001 002
3/4	0.750	0.218	0.437	0.375	1.063	0.250	1.125	100 101 152	501 001 014	500 003 036	502 001 002
7/8	0.750	0.250	0.625	0.375	1.125	0.312		100 101 140	501 001 015	500 001 014	502 001 003

MATERIALS: Studs are made from hardenable alloy steel

FLUX: All Nelson no thread studs have a solid flux load.

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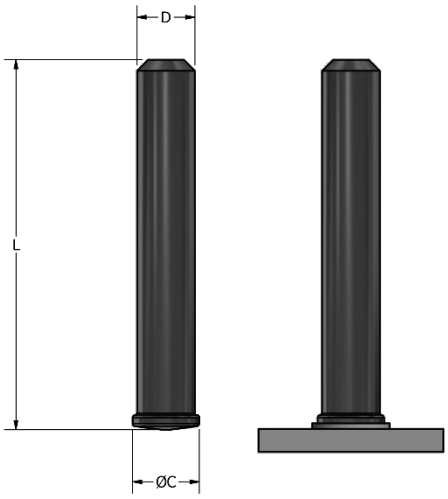
Nelson Stud Specification

Short Cycle / Stored Arc

ANC, ANS, and ANA Unthreaded Stored Arc Studs

Nelson ANC, ANS and ANA unthreaded studs are designed to be welded to thin gauge sheet metal using the Stored Arc method of stud welding, or a transformer/rectifier power-control source in the short-cycle mode. These applications generally provide a weld bond that is greater than the strength of the sheet to which they are welded.



Nelson Stored Arc studs have a flanged weld base that is about 1/32", or 1mm, greater than the nominal stud diameter. The "A" flange allows automatic stud feeding for increased production speeds. The flange also increases the stress area on the sheet. Standard studs come in lengths up to 1.25", 30mm.

Unthreaded Stored Arc studs are commonly used as locator or stop points. They may also be tapped with internal threads, or have smaller diameter externally threaded extensions. They also may have Speed Clips or self-threading nuts installed on them, and can be made with special chamfers to aid in the installation of such clips or nuts.

For similar function, see Nelson ATC Threaded Stored Arc™ studs, AXC "Fir Tree" studs, Grounding studs, H8X "T" studs, and "W" Top Wide Flange studs. In the imperial line of Nelson studs, see TATC Auto-Feed Capacitor Discharge studs, TFNC Flanged Capacitor Discharge studs, TFTC Flanged Capacitor Discharge studs, and TUTC Unflanged Capacitor Discharge Studs.

Stud Diameter	Flange Thickness A		Flange Diameter	Minimum Length	Required Standard Accessories		
D	Steel	Aluminum	C	L*	Chuck	Foot	Spark Shield
3/16	0.045	0.06	0.22	0.25	500 001 005	502 001 137	511 001 108
0.215	0.045	0.06	0.22	0.25	500 001 004	502 001 137	511 001 108
1/4	0.045	0.06	0.28	0.25	500 001 007	502 001 137	511 001 108
5/16	0.045	0.06	0.343	0.375	500 001 009	502 001 137	511 001 108
Metric							
3	0.75		4	8	500 001 135	502 001 137	511 001 108
4	0.9		5	8	500 001 003	501 001 137	511 001 108
5	1.1		6	8	500 001 427	502 001 137	511 001 108
6	1.3		7	10	500 001 267	502 001 137	511 001 108
8	1.65		9	12	500 001 009	502 001 137	511 001 108

MATERIALS: Studs are available in Low Carbon Mild Steel with copper flash plate (ANC), 18-8 Stainless Steel (ANS), and 1100 Aluminum (ANA). Some materials may be available by special order. Mild steel studs are copper flash plated, stainless studs are passivated, and aluminum studs are acid etched for superior weld results. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

***AUTO FEED:** For automatic feed applications, stud length must be a minimum of 1-1/2 times the flange diameter. Studs to be used in automatic feed systems must be 100% sorted (Auto Feed quality). Therefore, "Auto Feed (AF) Quality" must be requested and specified at time of quotation and order entry.

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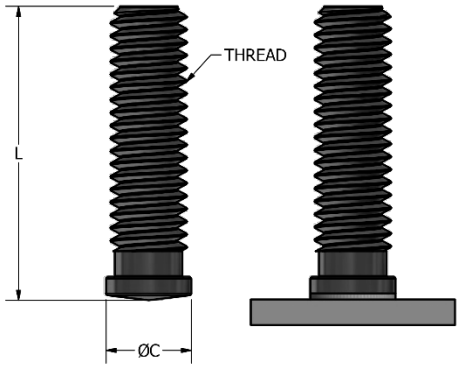
Nelson Stud Specification

Short Cycle / Stored Arc

ATC, ATS, and ATA Threaded Studs

Nelson metric Stored Arc ATC, ATS, and ATA studs are designed to be welded to thin gauge sheet metal using either the Stored-Arc method of stud welding, or a transformer/ rectifier power-control source in the short-cycle mode. These applications generally provide a weld bond that is greater than the strength of the sheet to which they are welded.



Nelson Stored Arc studs have a flanged weld base that is about 1/32" (1mm), greater than the nominal stud diameter. The "C" flange allows automatic stud feeding for increased production speeds. The flange also increases the stress area on the sheet. Standard studs are fully threaded in lengths up to 1.25" (32mm).

For similar function studs, see Nelson ANC Unthreaded Stored Arc™ studs, AXC "Fir Tree" studs, Grounding studs, H8X "T" studs, TATC Auto-Feed Capacitor Discharge studs, and "W" Top Wide Flangestuds.

Thread Size	Stud Diameter D	Flange Diameter C	Minimum Length L*	Required Standard Accessories		
				Chuck	Foot	Spark Shield
#6-32	0.138	0.168	0.25	500 001 002	502 001 137	511 001 108
#8-32	0.164	0.194	0.25	500 001 006	502 001 137	511 001 108
#10-24	0.187	0.22	0.25	500 001 005	502 001 137	511 001 108
#10-32	0.187	0.22	0.25	500 001 005	502 001 137	511 001 108
1/4-20	0.25	0.28	0.25	500 001 007	502 001 137	511 001 108
5/16-18	0.312	0.343	0.375	500 001 009	502 001 137	511 001 108
Metric						
M3 x 0.50	3.0	4.0	8.0	500 001 135	502 001 137	511 001 108
M4 x 0.70	4.0	5.0	8.0	500 001 003	501 001 137	511 001 108
M5 x 0.80	5.0	6.0	8.0	500 001 427	502 001 137	511 001 108
M6 x 1.00	6.0	7.0	10.0	500 001 267	502 001 137	511 001 108
M8 x 1.25	8.0	9.0	12.0	500 001 009	502 001 137	511 001 108

MATERIALS: Studs are available in Low Carbon Mild Steel (ATC), Stainless Steel (ATS), and 1100 Aluminum (ATA). Some materials may be available by special order. Mild steel studs are copper flash plated, stainless studs are passivated, and aluminum studs are acid etched for superior weld results. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: Standard external threads meet; UNC-2A, UNF-2A for #10-32, ISO 6g, as specified.

***AUTO FEED:** For automatic feed applications, stud length must be a minimum of 1-1/2 times the flange diameter. Studs to be used in automatic feed systems must be 100% sorted (Auto Feed quality). Therefore, "Auto Feed (AF) Quality" must be requested and specified at time of quotation and order entry.

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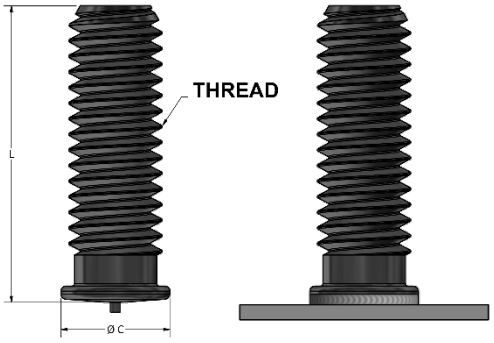
Nelson Stud Specification

Capacitor Discharge

TATC, TATS, TATA Auto-Feed Threaded Capacitor Discharge Studs



These studs are designed to be welded to thin gauge sheet material by the initial "gap" or "contact" method of stud welding using tip ignition according to the capacitor discharge (CD) process. These applications generally provide a weld bond whose strength is greater than that of the base material to which they are welded.

These studs have a special flanged weld base that is about 1/32", or 1mm, greater than the nominal stud diameter. The mini flange diameter "C" allows automatic stud feeding for increased production speeds. The flange also increases the stress area welded to the base material. These Nelson studs are fully threaded in lengths up to 1.25" (50mm).

Whereas these studs are designated as auto-feed studs, they are manual feed capable. Shown below is the equipment required for manual loading of TATC, TATS, and TATA studs.

For similar function studs, see Nelson ANC Unthreaded Stored Arc™ studs, ATC Threaded Stored Arc™ studs, and AXC "Fir Tree" studs.

Thread Size	Stud Diameter D	Flange Diameter C	Minimum Length L	Required Standard Accessories	
				Chuck* Series 650 Style Gun	Chuck Assembly CD-Lite Gun
#4-40	0.112	0.142	0.250	500 001 355	521322
#6-32	0.138	0.168	0.250	500 001 356	521323
#8-32	0.164	0.194	0.250	500 001 357	215502
#10-24	0.187	0.220	0.250	500 001 358	215503
#10-32	0.187	0.220	0.250	500 001 358	215503
1/4-20	0.250	0.280	0.250	500 001 359	215504
5/16-18	0.312	0.355	0.375	500 001 360	520327
3/8-16	0.375	0.418	0.375	500 001 369	N/A

* A backup pin or stud stop is required for use with these chucks. The list below shows part numbers and corresponding stud lengths for each pin length.

Back-up Pin Part Number	For Stud Lengths (inches)
500 017 017	1/4 to 5/8
500 017 018	3/4 to 1-1/8
500 017 019	1-1/4 to 1-5/8
500 017 020	1-3/4 to 2-1/8

MATERIALS: Studs are available in Low Carbon Mild Steel (TFTC), 18-8 Stainless Steel (TFTS), and 6061 Aluminum (TFTA). Some materials may be available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: Standard external threads are typically UNC-2A, or UNF-2A for #10-32.

THREADS: Standard external threads meet; UNC-2A, UNF-2A for #10-32, ISO 6g, as specified.

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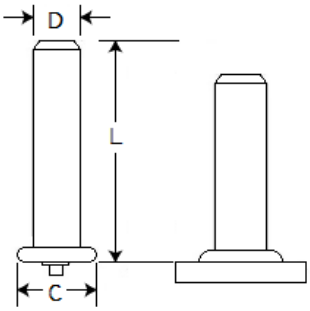
Nelson Stud Specification

Capacitor Discharge

TFNC, TFNS, and TFNA Flanged Unthreaded Capacitor Discharge Studs

TFNC, TFNS, TFNA



These unthreaded studs are designed to be welded to thin sheet material by the initial "gap" or "contact" method of stud welding using tip ignition according to the capacitor discharge (CD) weld process. These applications generally provide a weld bond strength that is greater than the strength of the thin base material to which they are welded.

Flanged unthreaded capacitor discharge studs are commonly used as locator or stop points. They may also be tapped with internal threads, or have smaller diameter externally threaded extensions

These studs have a flanged weld base that is about 1/16" (2mm) greater than the nominal stud diameter. The flange increases the weld bond area for greater reliability.

For similar function studs, see Nelson ANC Unthreaded Stored Arc™ studs and TPC Tipped Insulation pins.

Stud Diameter D	Flange Diameter C	Flange Thickness	Minimum Length L*	Required Standard Accessories	
				Chuck* Series 650 Style Gun	Chuck Assembly CD-Lite Gun
3/16	0.25		0.25	500 001 358	215503
1/4	0.312		0.25	500 001 359	215504
5/16	0.437		0.375	500 001 360	520327
Metric					
3	5	0.90	6	500 001 355	215500
4	6	0.90	6	500 001 361	215501
5	7	1.00	6	500 001 358	215502
6	8	1.20	8	500 001 362	215503
8	10.5	1.30	10	500 001 360	250104

* A backup pin or stud stop is required for use with these chucks. The list below shows part numbers and corresponding stud lengths for each pin length.

Back-up Pin Part Number	For Stud Lengths
500 017 017	1/4 to 5/8"
500 017 018	3/4 to 1-1/8"
500 017 019	1-1/4 to 1-5/8"
500 017 020	1-3/4 to 2-1/8"
500 017 017	6 – 16mm
500 017 018	20 – 30mm
500 017 019	32 – 40mm
500 017 020	45 – 55mm

MATERIALS: Studs are available in Low Carbon Mild Steel (TFTC), 18-8 Stainless Steel (TFTS), and 6061 Aluminum (TFTA). Some materials may be available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: Standard external threads meet; UNC-2A, UNF-2A for #10-32, ISO 6g, as specified.

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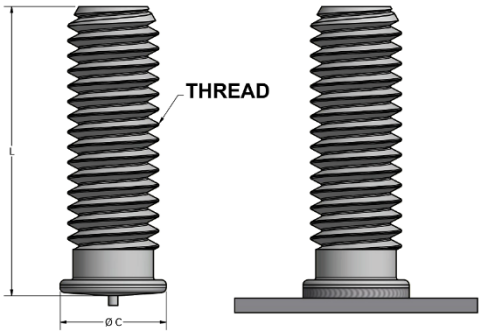
Nelson Stud Specification

Capacitor Discharge



TFTC, TFTS, and TFTA Flanged Threaded Capacitor Discharge Stud

These studs are designed to be welded to thin sheet material by the initial "gap" or "contact" method of stud welding using tip ignition according to the capacitor weld discharge process. These applications generally provide a weld bond strength that is greater than the strength of the thin base material to which they are welded.

These studs have a flanged weld base that is about 1/16" greater than the nominal stud diameter. The studs are fully threaded and come in lengths up to two inches.

For similar function studs, see Nelson ANC Unthreaded Stored Arc™ studs and AXC "Fir Tree" studs

Thread Size	Stud Diameter D	Flange Diameter C	Flange Thickness	Minimum Length L*	Required Standard Accessories	
					Chuck* Series 650 Style Gun	Chuck Assembly CD-Lite Gun
#4-40	**0.112**	0.187		0.250	500 001 355	521322
#6-32	**0.138**	0.218		0.250	500 001 356	521323
#8-32	**0.164**	0.250		0.250	500 001 357	215502
#10-24	**0.187**	0.250		0.250	500 001 366	215503
#10-32	**0.187**	0.250		0.250	500 001 366	215503
1/4-20	**0.25**	0.312		0.250	500 001 359	215504
5/16-18	**0.312**	0.375		0.375	500 001 360	520327
3/8-16	**0.375**	0.437		0.375	500 001 369	N/A
Metric						
M3 x 0.50	**3.00**	5.00	0.90	6.00	500 001 355	215500
M4 x 0.70	**4.00**	6.00	0.90	6.00	500 001 361	215501
M5 x 0.80	**5.00**	7.00	1.00	6.00	500 001 358	215502
M6 x 1.00	**6.00**	8.00	1.20	8.00	500 001 362	215503
M8 x 1.25	**8.00**	10.50	1.30	10.00	500 001 360	250104

* A backup pin or stud stop is required for use with these chucks. The list below shows part numbers and corresponding stud lengths for each pin length.

Back-up Pin Part Number	For Stud Lengths
500 017 017	1/4 to 5/8"
500 017 018	3/4 to 1-1/8"
500 017 019	1-1/4 to 1-5/8"
500 017 020	1-3/4 to 2-1/8"
500 017 017	6 – 16mm
500 017 018	20 – 30mm
500 017 019	32 – 40mm
500 017 020	45 – 55mm

MATERIALS: Studs are available in Low Carbon Mild Steel (TFTC), 18-8 Stainless Steel (TFTS), and 6061 Aluminum (TFTA). Some materials may be available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: Standard external threads are typically UNC-2A, or UNF-2A for #10-32.

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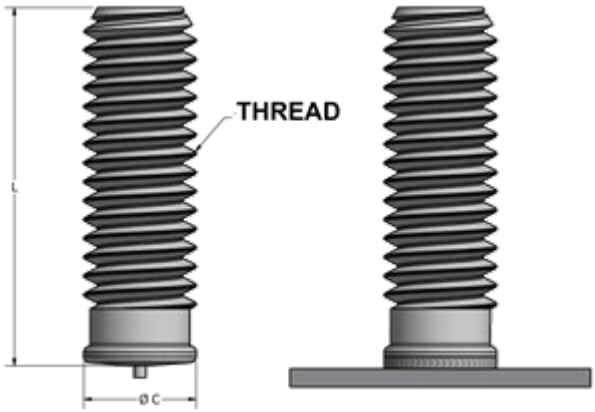
Nelson Stud Specification

Capacitor Discharge

TUTC, TUTS, and TUTA Unflanged Threaded Capacitor Discharge Studs



These unflanged studs are designed to be welded to thin sheet material by the initial “gap” or “contact” method of stud welding using tip ignition according to the capacitor discharge process. These applications generally provide a weld bond whose strength is sufficient for the application when considering the strength of the sheet to which they are welded.

These studs have a flanged weld base which is about the same as the stud diameter. The unflanged studs are used where weld fillet control is more important than weld strength and reliability. The studs are fully threaded, and come in lengths up to 2”.

For similar function, see Nelson ANC Unthreaded Stored Arc studs and AXC “Fir Tree” studs

Thread Size	Stud Diameter D	Flange Diameter C	Minimum Length L	Required Standard Accessories	
				Chuck* Series 650 Style Gun	Chuck Assembly CD-Lite Gun
#4-40	0.112	0.111	0.250	500 001 355	521322
#6-32	0.138	0.137	0.250	500 001 356	521323
#8-32	0.164	0.163	0.250	500 001 357	215502
#10-24	0.187	0.189	0.250	500 001 366	215503
#10-32	0.187	0.189	0.250	500 001 366	215503
1/4-20	0.250	0.250	0.250	500 001 359	215504
5/16-18	0.312	0.312	0.375	500 001 360	520327
3/8-16	0.375	0.375	0.375	500 001 369	N/A

* A backup pin or stud stop is required for use with these chucks. The list below shows part numbers and corresponding stud lengths for each pin length.

Back-up Pin Part Number	For Stud Lengths (inches)
500 017 017	1/4 to 5/8
500 017 018	3/4 to 1-1/8
500 017 019	1-1/4 to 1-5/8
500 017 020	1-3/4 to 2-1/8

MATERIALS: Studs are available in Low Carbon Mild Steel (TFTC), 18-8 Stainless Steel (TFTS), and 6061 Aluminum (TFTA). Some materials may be available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: Standard external threads are typically UNC-2A, or UNF-2A for #10-32.

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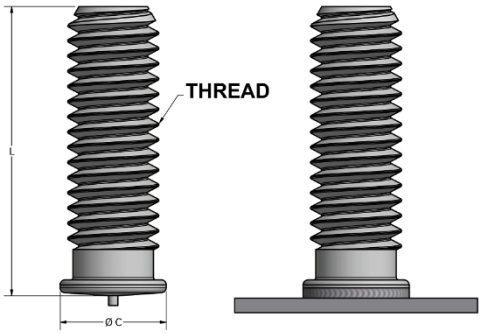
Nelson Stud Specification

Capacitor Discharge

TFTC, TFTS, TFTA Flanged Threaded CD Studs

These threaded metric studs are designed to be welded to thin sheet material by the initial “gap” or “contact” method of stud welding using tip ignition capacitor weld discharge process. These applications generally provide a weld bond strength that is greater than the strength of the thin base material to which they are welded.



These studs have a flanged weld base that is about 2mm greater than the nominal stud diameter. The studs are fully threaded, and come in lengths up to 50mm.

For similar function studs, see Nelson ANC Unthreaded Stored Arc studs and TPC Tipped Insulation pins. In the imperial line of Nelson Studs, see TATC Auto-Feed Capacitor Discharge studs and TFNC Flanged Unthreaded Capacitor Discharge studs.

* A backup pin or stud stop is required for use with these chucks. The list below shows part numbers and corresponding stud lengths for each pin length.

Back-up Pin Part Number	For Stud Lengths (millimeters)
500 017 017	6 – 16
500 017 018	20 – 30
500 017 019	32 – 40
500 017 020	45 – 55

MATERIALS: Studs are available in Low Carbon Mild Steel (TFTC), 18-8 Stainless Steel (TFTS), and 6061 Aluminum (TFTA). Some materials may be available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

THREADS: Standard external metric threads meet ISO 6g.

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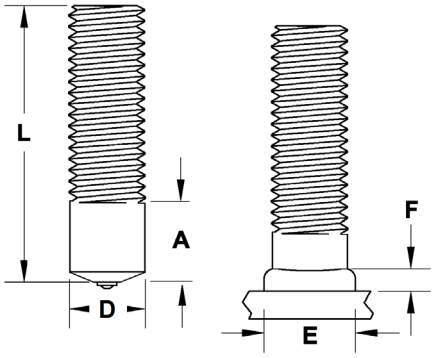
Nelson Stud Specification

Aluminum Drawn Arc

HBA Full Base Threaded Aluminum Studs

HBA



Nelson HBA threaded aluminum studs are available in thread sizes of #10-24 through 1/2-13. They are used for attaching parts to aluminum structures. They are welded using ceramic ferrules in conjunction with argon as a shielding gas. The full nominal weld base for the HBA studs gives greater weld reliability and strength than could be achieved using a pitch diameter weld base.

The shielding gas is introduced to the weld area through a gas foot assembly, #751020000, which is used for all diameters of HBA studs. Gas hose #515001001 and gas regulator #514001001 are needed to deliver and control the gas flow from a pressurized cylinder.

An aluminum Tranquil-Arc™ plunge dampener kit is also needed as an accessory on the gun to control the rate of the stud's return in to the molten weld metal at the end of the weld cycle.

For similar function, please refer to Nelson NBA Unthreaded Aluminum studs and TBA Internally Threaded Aluminum studs.

Thread Size	Stud Diameter	Minimum Unthreaded	Minimum Stud Length	Weld Flash Size		Burn Off	Flash Clearance	Required Standard Accessories	
	D	A	L	E	F			Ferrule	Chuck
#10-24	3/16	0.312	0.812	0.330	0.125	0.093	0.390	100 101 046	500 001 005
1/4-20	1/4	0.312	0.937	0.406	0.125	0.093	0.469	100 101 047	500 001 007
5/16-18	5/16	0.343	0.937	0.468	0.156	0.093	0.531	100 101 048	500 001 009
3/8-16	3/8	0.390	0.937	0.603	0.187	0.093	0.656	100 101 049	500 001 011
7/16-14	7/16	0.468	0.937	0.656	0.218	0.093	0.750	100 101 050	500 001 012
1/2-13	1/2	0.515	0.937	0.750	0.250	0.125	0.843	100 101 051	500 001 014

MATERIALS: HBA Studs are only available in 5356 Aluminum. The maximum length of useable thread on all HBA aluminum studs is 1- 1/4". For specific grade information and physical and chemical properties, conforming standards, and information on heat treating, please see General Material Specifications.

THREADS: Standard external threads are UNC-2A.

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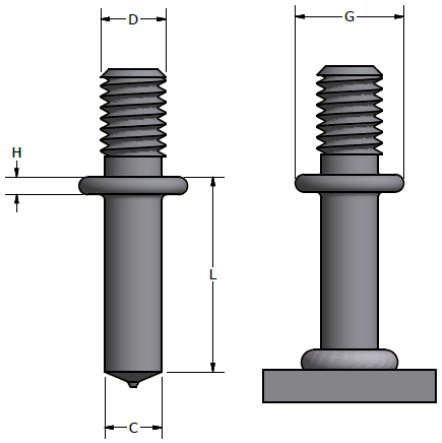
Nelson Stud Specification

Aluminum Drawn Arc

CKA Aluminum Collar Studs

Nelson CKA aluminum collar studs are available in thread sizes of 1/4-20 through 1/2-13. They are used for attaching parts to aluminum structures. They are welded using ceramic ferrules in conjunction with argon as a shielding gas. The collar on CKL studs is useful in mounting applications where a standoff is needed.



The shielding gas is introduced to the weld area through a gas foot assembly, #751020000, which is used for all diameters of CKA studs. Gas hose #515001001 and gas regulator #514001001 are needed to deliver and control the gas flow from a pressurized cylinder.

An aluminum Tranquil-Arc™ plunge dampener kit is also needed as an accessory on the
gun to control the rate of the stud's return in to the molten weld metal at the end of the weld cycle.

Studs are available in before weld lengths greater than the specified minimum length to a maximum of 4-1/8".

For similar function studs, please refer to Nelson HBA Threaded Full Base studs and TBA Internally Threaded studs.

Thread Size	Stud Diameter D	Weld Base C	Minimum Stud Length L	G	H	Burn Off	Flash Clearance	Required Standard Accessories	
								Ferrule	Chuck
1/4-20	**1/4**	0.215	0.500	0.500	0.093	0.125	0.469	100 101 047	500 001 007
5/16-18	**5/16**	0.275	0.500	0.562	0.093	0.156	0.531	100 101 048	500 001 009
3/8-16	**3/8**	0.330	0.625	0.625	0.093	0.187	0.656	100 101 049	500 001 011
7/16-14	**7/16**	0.387	0.625	0.750	0.093	0.218	0.750	100 101 050	500 001 012
1/2-13	**1/2**	0.448	0.625	0.750	0.093	0.250	0.843	100 101 051	500 001 014

MATERIALS: CKA Studs are available in 5356-H32 Aluminum. For specific grade information and physical and chemical properties, as well as information on heat treating, please see General Material Specifications.

THREADS: Standard external threads are UNC-2A.

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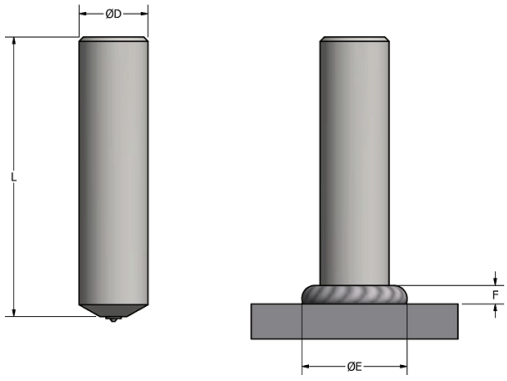
Nelson Stud Specification

Aluminum Drawn Arc

NBA Unthreaded Aluminum Studs

Nelson NBA unthreaded aluminum studs are available in diameters of 3/16” through 1/2". They are used as mounting, pivot, and stop pins on aluminum structures.
They are welded using ceramic ferrules in conjunction with argon as a shielding gas.



The shielding gas is introduced to the weld area through a gas foot assembly, #751020000, which is used for all diameters of NBA studs. Gas hose #515001001 and gas regulator #514001001 are needed to deliver and control the gas flow from a pressurized cylinder.

An aluminum Tranquil-Arc™ plunge dampener kit is also needed as an accessory on the gun to control the rate of the stud’s return in to the molten weld metal at the end of the weld cycle.

For similar function, please refer to Nelson HBA Threaded Aluminum studs and TBA Internally Threaded studs.

Stud	Minimum Stud	Burn Off	Weld Flash Size		Flash Clearance	Required Standard Accessories	
D	L		E	F		Ferrule	Chuck
3/16	0.812	0.093	0.330	0.125	0.390	100 101 046	500 001 005
1/4	0.937	0.093	0.406	0.125	0.469	100 101 047	500 001 007
5/16	0.937	0.093	0.468	0.156	0.531	100 101 048	500 001 009
3/8	0.937	0.093	0.603	0.187	0.656	100 101 049	500 001 011
7/16	0.937	0.093	0.656	0.218	0.750	100 101 050	500 001 012
1/2	0.937	0.125	0.750	0.250	0.843	100 101 051	500 001 014

MATERIALS: NBA Studs are only available in Aluminum. For specific grade information and physical and chemical properties, as well as information on heat treating, please see General Material Specifications.

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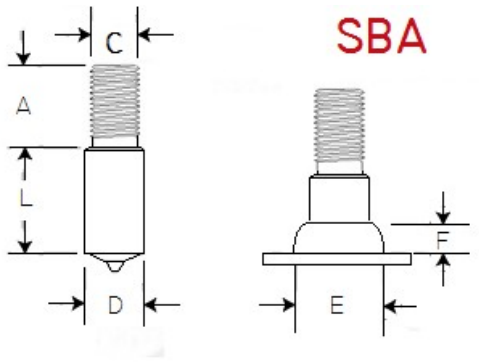
Nelson Stud Specification

Aluminum Drawn Arc

SBA Threaded Aluminum Shoulder Studs



Nelson SBA shoulder studs have a weld base diameter larger than the threaded extension diameter. They are available in weld base diameters 1/4" through 1/2", with threaded extension sizes up to 7/16-14.

The Nelson SBA studs are used as mountings for panels and hardware where a standoff shoulder is needed. SBA studs are similar to CKA aluminum collar studs, but the larger weld base provides improved bend resistance.

Both chuck size and part numbers are determined by the thread size, C. Please refer to the Nelson HBA stud specification sheet to find the appropriate chuck size and number.

Nelson SBA studs are welded using ceramic ferrules in conjunction with argon as a shielding gas. The shielding gas is introduced through a gas foot assembly, #751020000, which is used for all diameters of SBA studs. Gas hose #515001001 and a gas regulator #514001001 are needed to deliver and control the gas flow from a pressurized cylinder.

An aluminum Tranquil-Arc plunge dampener kit is also needed as an accessory on the gun to control the rate of the stud's return to the molten weld metal at the end of the weld cycle.

For similar function aluminum studs, please refer to Nelson CKA Threaded Aluminum Collar studs, HBA Threaded Full Base studs, and TBL Internally Threaded studs.

Major Diameter D	Maximum Thread Diameter C	Standard Maximum Length A	Minimum Length L	Weld Flash Dimensions		Required Standard Accessories		
				E	F	Ferrule	Grip	Foot
1/4	#10-24	0.468	0.312	0.406	0.125	100 101 047	501 001 007	500 001 007
5/16	1/4-20	0.635	0.343	0.468	0.156	100 101 048	501 001 006	500 001 009
3/8	5/16-18	0.781	0.390	0.603	0.187	100 101 049	501 001 009	500 001 011
7/16	3/8-16	0.937	0.468	0.656	0.218	100 101 050	501 001 008	500 001 012
1/2	7/16-14	0.937	0.500	0.750	0.250	100 101 151	501 001 011	500 001 014

MATERIALS: Studs are available in 5356 Aluminum. Material selection is dependent on anticipated service temperature range. For specific grade information and physical and chemical properties, conforming standards, and information on heat treating, please see General Material Specifications.

THREADS: Standard external threads are UNC-2A.

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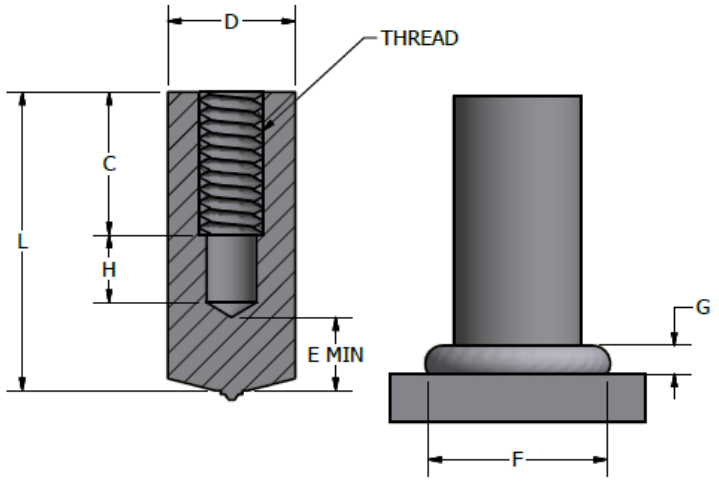
Nelson Stud Specification

Aluminum Drawn Arc

TBA Internally Threaded Aluminum Studs

Nelson TBA internally threaded aluminum studs are available with weld base diameters of 1/4” through 1/2", with thread sizes of #10-24 through 1/2-13. They are used as mounting points on aluminum structures. They are welded using ceramic ferrules in conjunction with argon as a shielding gas.



The shielding gas is introduced to the weld area through a gas foot assembly, #751020000, which is used for all diameters of TBA studs. Gas hose #515001001 and gas regulator #514001001 are needed to deliver and control the gas flow from a pressurized cylinder.

An aluminum Tranquil-Arc™ plunge dampener kit is also needed as an accessory on the gun to control the rate of the stud’s return in to the molten weld metal at the end of the weld cycle.

The minimum length of Nelson TBA studs, shown below, is the before weld length of the stud, and is dependent on the thread depth.

For similar function aluminum studs, please refer to Nelson HBA Externally Threaded Aluminum studs, SBA Aluminum Shoulder studs, and CKA Aluminum Collar studs.

Stud Diameter D	Maximum Tap Diameter C	Minimum Stud Length, L		Weld Base Diameter B	Burn Off	Weld Flash Size		Flash Clearance	Required Standard Accessories	
		D = 1/2 max	D = 5/8 & 3/4			E	F		Ferrule	Chuck
1/4	10-24	0.937	N/A	1/4	0.093	0.406	0.125	0.469	100 101 047	500 001 007
5/16	1/4-20	1.062	1.500	5/16	0.093	0.468	0.156	0.531	100 101 048	500 001 009
3/8	5/16-	1.187	1.593	3/18	0.093	0.603	0.187	0.656	100 101 049	500 001 011
7/16	3/8-16	1.312	1.718	7/16	0.093	0.656	0.218	0.750	100 101 050	500 001 012
1/2	7/16-	N/A	1.906	1/2	0.125	0.750	0.250	0.843	100 101 051	500 001 014
5/8	1/2-13	N/A	2.000	1/2	0.125	0.750	0.250	0.843	100 101 051	500 001 016
3/4	1/2-13	N/A	2.000	1/2	0.125	0.750	0.250	0.843	100 101 051	500 001 018

MATERIALS: TBA Studs are only available in Aluminum. For specific grade information and physical and chemical properties, as well as information on heat treating, please see General Material Specifications.

THREADS: Standard depth of useable threads, **A**, is 1-1/2 times the tap diameter. All internal threads are UNC-2B.

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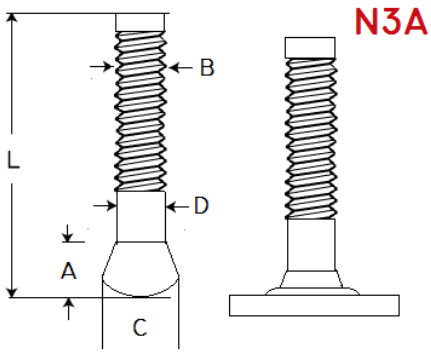
Nelson Stud Specification

Aluminum Drawn Arc

N3A Aluminum Navy Type Annular Pins

N3A Navy pins are welded for the attachment of insulation. The insulation is impaled over the welded studs and retained with caps that are driven onto the studs, and lock onto the annular rings. The 5/16" diameter welded end on Nelson N3A pins permits welding without the use of inert gas shielding, which is normally required when welding aluminum studs.



The flat top caps for use with N3A studs are usually supplied in aluminum. They can also be supplied in plated mild steel or stainless steel, per the N3P Annular Ring stud. The standard N3A cap is shown below and is supplied in aluminum.

For similar function studs, see Nelson N3P Annular Ring Navy Pin, P2P Double Pointed Insulation Pins, TPC Single Pointed Insulation Pins, and CHP Cupped Headed Insulation Pins.

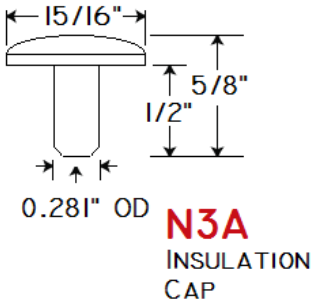
Stud Description	Minimum Length L	D	A	B	C	Required Standard Accessories			
						Ferrule	Chuck	Grip	Foot
3/16 x L	1.000	0.178	0.250	0.176	0.312	100 101 007	500 001 005	501 001 006	502 001 137

MATERIALS: Studs are available in Aluminum. For specific grade information and physical and chemical properties, and conforming standards, please see General Material Specifications.

RECOMMENDED ACCESSORIES SPECIFICATION

Cap for N3A and N3P Pins

Caps are used in conjunction with Nelson N3A and N3P pins to secure many types of insulation to steel plate.



Description	Part Number
Insulation Cap	101 304 002

Materials: The Navy pin cap is supplied in Aluminum. For specific grade information and physical and chemical properties, and conforming standards, please see General Material Specifications.

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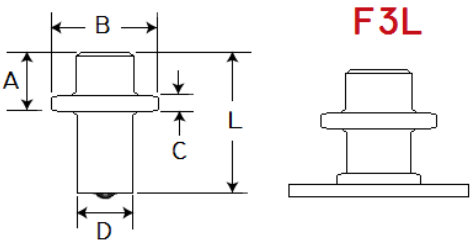
Nelson Stud Specification

Refractory Anchors for Stud Welding

F3L Flanged Collar Studs

F3L studs are used as anchors to secure various refractory materials. Their most common use is for attachment of curved refractory blocks to steel skid tubes in steel mills. Wires are wrapped under the collars and around the blocks.

Cast, troweled, or gunned refractory is also applied over Nelson F3L studs. Various lengths of F3L studs are produced to accommodate different thickness of block or applied refractory.



For similar function studs, see Nelson CKL Collar Studs.

Stud Description	Stud Diameter D	A	B	C	Ferrule*	Required Standard Accessories		
						Grip	Chuck Assembly	Foot**
1/2 x L	0.500	0.500	0.875	0.125	100 101 119	501 001 012	500 001 014	502 001 138

* Ferrule used to weld 3” diameter pipe 100102026.

** 502 001 138 foot is used with standard duty guns. 502001002 foot is used with heavy duty guns.

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

FLUX: All Nelson F3L studs have a solid flux load.

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Nelson Stud Specification

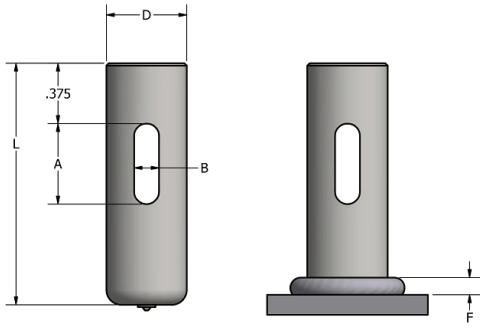
Refractory Anchors for Stud Welding

L2L Lagging Studs with Hole

L2L studs are welded to hot work, such as furnaces, kilns, ducts, or tanks. They are intended for the attachment of insulation blankets using wires or “gull wing” wire skewers.

Nelson L2L studs are also welded around openings in plates for retention of cover plates with wedge pins inserted through the slots.

For similar function studs, see Nelson R6P Rectangular Slotted studs, E2L “Eyebolt” studs, and R7P Rectangular Studs with Hole.



Stud Description	Stud Diameter D	A	B	Weld Flash		Required Standard Accessories			
				Diameter E	Height F	Ferrule	Chuck Assembly	Foot*	Grip
3/8 x L	0.375	0.500	0.156	0.500	0.125	100 101 099	500 001 011	502 001 137	501 001 009

* 502 001 137 foot is used with standard duty guns. 502 001 001 foot is used with heavy duty guns.

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

FLUX: All Nelson L2L studs have a solid flux load.

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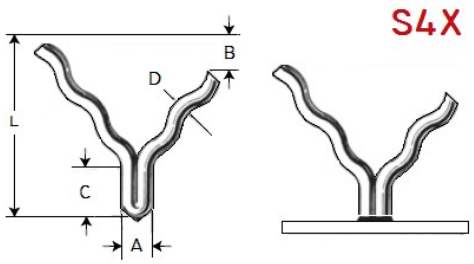
Nelson Stud Specification

Refractory Anchors for Stud Welding

S4X "Y" Refractory Anchor Studs



Nelson S4X refractory studs are used to secure single component castable or gunite linings of medium to heavy density material (up to 170 lb. per cubic foot). S4X studs are used on the lining of petroleum and petrochemical towers, boilers, precipitators, heaters, stacks, and breechings, and in other situations where extreme temperature is not encountered. The use of S4X studs with one-shot linings is well established.

One leg of the S4X stud is shorter than the other to eliminate any shear plane failure tendencies common to higher density materials at elevated temperatures.

Nelson S4X studs are available in lengths up to 8" before weld length. After weld length is approximately 1/8" less than the before weld length.

For similar function Nelson studs, please see R2P Rectangular Notched studs, R6P Rectangular Slotted studs, S7X "Steerhorn" Anchors, RWP Wiggley Rectangular Two Tine studs, and B4L Reinforcing Standoff Support studs.

D	Minimum L	A	B	C	Required Standard Accessories		
					Ferrule	Chuck	Grip/Foot
0.250	2.000	0.562	0.500	0.750	100 101 127	500 015 073	501 006 018

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Material selection is dependent on anticipated service temperature range. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

FLUX: All Nelson S4X studs have a solid flux load.

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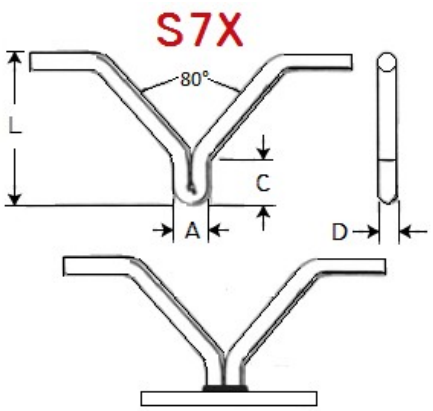
Nelson Stud Specification

Refractory Anchors for Stud Welding



S7X Steerhorn Refractory Anchor Studs

Nelson S7X refractory studs are used to secure castable or gunite linings of light to medium density material (up to 90 lb. per cubic foot). It is used on the lining of petroleum and petrochemical process industry furnaces, heaters, stacks, breechings, and in other situations where extreme temperature is not encountered. Its use with one-shot linings is well established.

The measurement from tine to tine across the top of the S7X stud is designed to be approximately twice the overall height of the anchor. The after weld length of S7X studs will be approximately 1/8" less than the before weld length.

For similar function Nelson studs, please see R2P Rectangular Notched studs, R6P Rectangular Slotted studs, S4X "Y" Anchors, RWP Wiggley Rectangular Two Tine studs, and B4L Reinforcing Standoff Support studs.

D	Minimum L	A	C	Required Standard Accessories		
				Ferrule	Chuck	Grip/Foot
3/16	1.125	0.515	0.625	100 101 170	500 015 073	501 006 018

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Material selection is dependent on anticipated service temperature range. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

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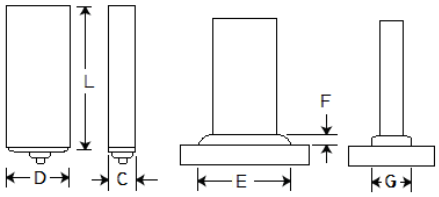
Nelson Stud Specification

Rectangular Studs

RIL

R1P and R1L Rectangular Stud without Hole



Nelson R1P and R1L studs are used for a variety of purposes. Frequently, they are used as stops, standoffs, or tabs for locating or positioning parts in assemblies. They are also used as refractory anchors to increase the surface area of furnaces or molds, where they act as cooling fins.

The smaller, 1/8 x 1/4", 1/8 x 3/8”, and 1/8 x 5/8” weld base rectangular studs have a sufficiently small weld base so as to not require a flux load in the weld end of the stud. For this reason, these are called R1P studs.

The 3/16” and thicker rectangular weld base studs are flux loaded due to the increased volume of steel melted during the weld process. These studs are called R1L studs.

Rectangular studs capable of performing similar duties include R2P Rectangular Notched studs, R5P Strand Support studs, R6P Rectangular Slotted studs, R7P rectangular Stud with Hole, and RWP Wiggley Two Tine Refractory Anchors.

Stud Description	Minimum Length	Stud Dimensions		Weld Flash Size			Required Standard Accessories			
	L	C	D	E	F	G	Ferrule	Chuck	Grip	Foot
1/8 x 1/4	1.00	0.125	0.250	0.312	0.093	0.022	100 301 014	500 005 118	501 001 006	502 001 137
1/8 x 3/8	1.00	0.125	0.375	0.437	0.093	0.022	100 301 002	500 005 003	501 001 007	502 001 137
1/8 x 5/8	1.00	0.125	0.375	0.687	0.093	0.218	100 301 003	500 005 014	501 001 012	502 001 138
3/16 x 5/8	1.00	0.187	0.625	0.750	0.125	0.312	100 301 007	*	N/A[1]	503 003 000
3/16 x 3/4	1.00	0.187	0.750	0.875	0.125	0.312	100 301 006	500 005 007	501 001 012	502 001 138
1/4 x 1	1.00	0.250	1.000	1.125	0.187	0.406	100 301 010	500 005 012	501 001 015	502 001 003
1/4 x 1 1/4	1.25	0.250	1.250	1.468	0.187	0.468	100 301 012	500 005 019	N/A[1]	503 001 000
3/8 x 1	1.00	0.375	1.000	1.156	0.218	0.515	101 301 023	500 005 101	N/A[1]	503 022 000
1/2 x 1 1/2	2.00	0.500	1.500	1.750	0.281	0.813	101 301 035	500 005 121	N/A[1]	501 006 056
5/8 x 1 1/2	2.50	0.625	1.500	1.750	0.312	1.000	101 301 032	500 005 122	N/A[1]	501 006 056

* No chuck is shown for 3/16 x 5/8 rectangular studs due to the fact that the 3/16 x 5/8” ferrule and weld base is used on studs that have a wider upper section. Chucks are available for 3/16 x 3/4, 7/8, 1, or even 1-1/2” wide studs. The upper portion of the stud determines the chuck that is needed to hold the studs during the stud welding process.

[1] The foot assembly functions as the ferrule grip. No grip is needed.

MATERIALS: R1P and R1L studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

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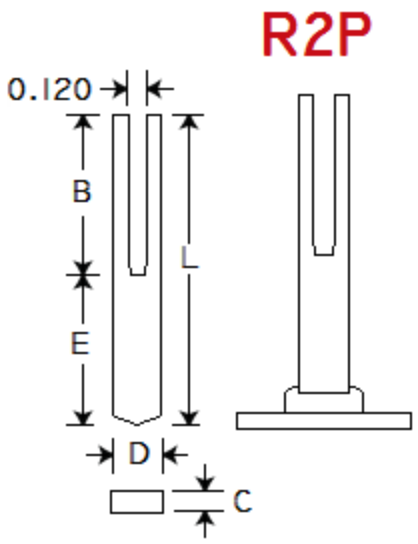
Nelson Stud Specification

Rectangular Studs

R2P Rectangular Notched Stud



Nelson R2P studs are used in a variety of ways to secure one and two component refractory linings. The refractory may be low density blanket or block, or medium to high density cast, gunned, or troweled insulation.

When used with a single component cast, gunned, or troweled lining, the R2P is welded, the tines spread, and the refractory placed.

With two component linings, the R2P is welded, the back-up layer placed, the tines bent, and the working lining placed over the bent tines. We suggest that the tines be spread to a maximum central angle of 70°. Spreading the tines may be easily done with a piece of small diameter pipe or a set of pliers.

The Nelson R2P is also used to secure block insulation alone. In this case, the stud is welded in place, the insulation impaled over the stud, and the tines bent flush with the insulation. The 1/8 x 3/8 R2P is most frequently used for this service, with the length chosen so that the tines protrude at least 1-1/2” beyond the impaled insulation before bending.

For similar function studs, see Nelson CKL Collar studs, R5P Strand Support studs, R6P Rectangular Slotted studs, R7P Rectangular Stud with Hole, RWP Wiggley Two Tine studs, RXX Fiberlok studs, S4X “Y” Anchors, and S7X Steerhorn Anchors.

Stud Description	Thickness C	Stud Dimensions					Required Standard Accessories			
		Width D	B	E	Minimum Length	Maximum Length	Ferrule	Chuck	Grip	Foot
1/8 x 3/8	0.125	0.375	1.250	0.250	1.500	6.125	100 301 002	500 005 003	501 001 007	502 001 137
1/8 x 5/8	0.125	0.625	2.000	0.312	2.312	6.125	100 301 003	500 005 014	501 001 012	502 001 138
1/8 x 5/8	0.125	0.625	0.75 - 4.00	0.312	1.625	4.875	100 301 003	500 005 014	501 001 012	502 001 138
1/8 x 5/8	0.125	0.625	0.75 - 4.00	0.625	1.625	4.875	100 301 003	500 005 014	501 001 012	502 001 138
1/8 x 5/8	0.125	0.625	0.75 - 4.00	0.875	1.625	4.875	100 301 003	500 005 014	501 001 012	502 001 138

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

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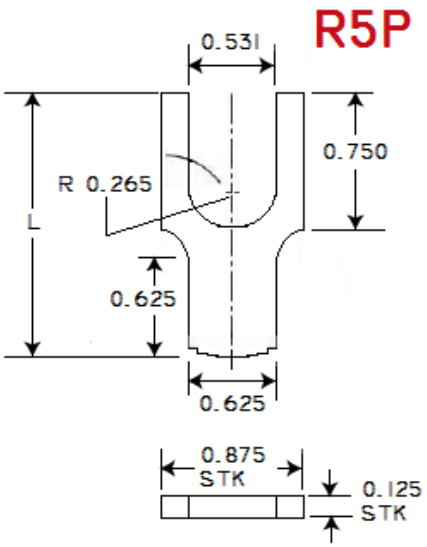
Nelson Stud Specification

Rectangular Studs

R5P Strand Support Stud

Nelson R5P studs are welded to plates that are cast into pre-stressed concrete beams and structural members for building construction. The studs are positioned so that a pre-stressed cable strand bears on the notch in the end of the stud. The strand pressure applied to the stud and plate assembly keeps the plate securely in place against the form while the concrete is poured and has cured.



The bottom of the notch, which determines the height of the strand, can be calculated by subtracting the 3/4" notch depth and the 1/8" weld burn-off, from the overall length of the R5P stud.

Older R8P style strand supports had only a shallow "V" notch in the top of the stud. The notch was not reliable for keeping the cable strand in place. The R5P studs have a crimp-able deep notch with ears that can be crimped over the cables. D2L and H4L studs are often welded to the same plates as the R5P studs.

Rectangular studs capable of performing similar duties include R2P Rectangular Notched studs, R6P Rectangular Slotted studs, R7P Rectangular Stud with Hole, and RWP Wiggley Two Tine Refractory Anchors.

Thickness	Width	Minimum Length	Required Standard Accessories		
			Ferrule	Chuck	Ferrule Foot Plate
1/8	0.875	1.500	100 301 003	500 005 005	501 006 011

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

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Nelson Stud Specification

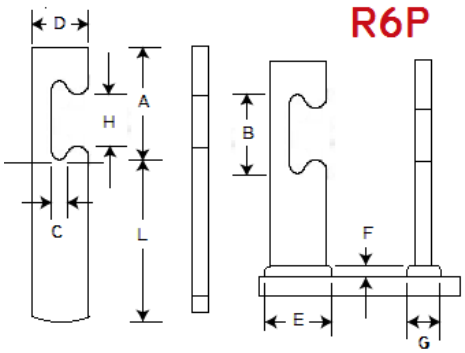
Rectangular Studs

R6P Rectangular Slotted Stud

R6P rectangular notched studs are used to attach wire reinforcing mesh to steel furnace and chimney liners. The mesh is used to anchor sprayed, gunned, or troweled refractory. R6P studs are also used to position wire mesh in poured concrete assemblies, such as enforcing lined concrete piping. The stud length to the notch determines the height of the reinforcing wire.

Additional security and stability may be gained by bending over the top portion of the stud to lock the wire in place and prevent slippage

For similar function studs, see Nelson R2P Rectangular Notched studs, R7P Rectangular Studs with Hole, RWP Wiggley Rectangular Two Tine studs, and B4L Reinforcing Standoff Support studs.



Stud Description	Minimum Length*	Stud Dimensions					Weld Flash Dimensions			Required Standard Accessories			
		D	A	B	C	H	E	F	G	Ferrule	Chuck	Grip	Foot
1/8 x 3/8	1/2	0.375	0.749	0.531	0.130	0.343	0.437	0.093	0.218	100 301 002	500 005 003	501 001 007	502 001 137
1/8 x 5/8	7/8	0.625	1.250	1.000	0.255	0.562	0.687	0.093	0.218	100 301 003	500 005 014	501 001 012	502 001 138
1/8 x 7/8	7/8	0.875	1.250	1.000	0.500	0.500	0.687	0.093	0.218	100 301 003	500 005 005	501 006 011	

***Length does not include the A dimension which is bent over the wire mesh.**

MATERIALS: Studs are available in Low Carbon Mild Steel and Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

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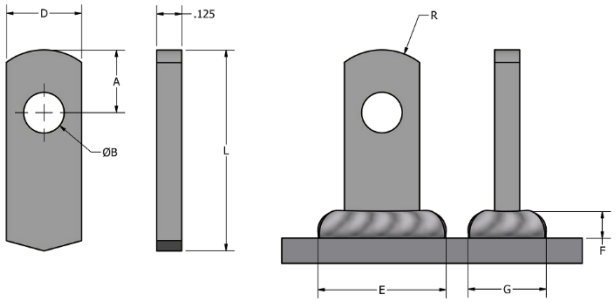
Nelson Stud Specification

Rectangular Studs

R7P Rectangular Slotted Stud

R7P rectangular studs with holes are used for a variety of fastening purposes. Wires or bolts may pass through the holes for suspending ceilings. Nelson studs can also be used to suspend assemblies on conveyor lines during painting and baking operations.

For similar function studs, see Nelson R2P Notched Rectangular stud, R5P Strand Support stud, R6P Slotted Rectangular stud, R9L Rope Hook studs, E2L "Eyebolt" studs, J2L "J" Bolt studs, and L2L Lagged stud with Hole.



Stud Description	Minimum Length L	Stud Dimensions			Weld Flash Size			Required Standard Accessories			
		D	A	B	E	F	G	Ferrule	Chuck	Grip	Foot
1/4 x 1 1/4	1.250										
1/8 x 3/8	1.000	0.375	0.312	0.203	0.437	0.093	0.218	100 301 002	500 005 003	501 001 007	502 001 137
1/8 x 5/8	1.500	0.625	0.312	0.312	0.687	0.093	0.218	100 301 003	500 005 014	501 001 012	502 001 138
1/8 x 7/8	1.203	0.875	0.468	0.500	0.687	0.093	0.500	100 301 015	500 005 005	501 006 011	

MATERIALS: Studs are available in Low Carbon Mild Steel and Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

Nelson Stud Specification

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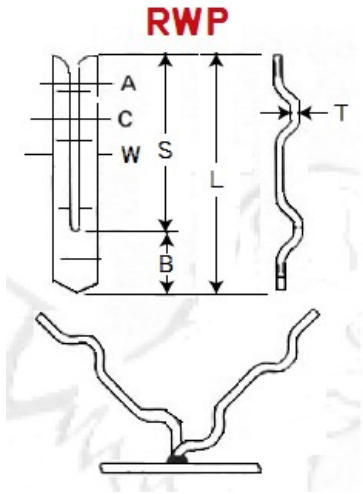
Rectangular Studs

RWP Wiggley Strand Support Stud



Nelson RWP rectangular two tine studs are designed for securing both one and two component medium and high density refractory linings. The deformed tines prevent the anchor from “backingout” of the lining while in service.

RWP studs are supplied with tines parallel to each other. The studs are welded in this configuration, and in this position blanket insulation may be impaled. The tines may then be spread, and cast or gunned insulation may be further applied to the wiggled “Y” anchor that protrudes.

Nelson RWP studs are available in lengths up to 13”. The studs up to 2-1/8” to 3” long have a 1-1/2” tine length and a single deformation. Studs 3-1/8” to 4” long have tine lengths of 2-1/2” with two deformations. Studs over 4-1/8” in length have 3-1/2” tine lengths with three deformations.

For similar function studs, see Nelson R2P Rectangular Notched studs, R6P Rectangular Slotted studs, S4X “Y” Anchor studs, S7X Steerhorn Anchors, and B4L Reinforcing Standoff Support studs.

Standard Tine Length S	Minimum Base Length B	Minimum Length L	T	W	A	C	Required Standard Accessories			
							Ferrule	Chuck	Foot	Grip
1.500	0.500	2.125	0.125	0.625	0.250	0.125	100 301 003	500 005 014	502 001 002	501 001 012
2.500	0.500	3.125	0.125	0.625	0.250	0.125	100 301 003	500 005 014	502 001 002	501 001 012
3.500	0.500	4.125	0.125	0.625	0.250	0.125	100 301 003	500 005 014	502 001 002	501 001 012

MATERIALS: Studs are available in Low Carbon Mild Steel and Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

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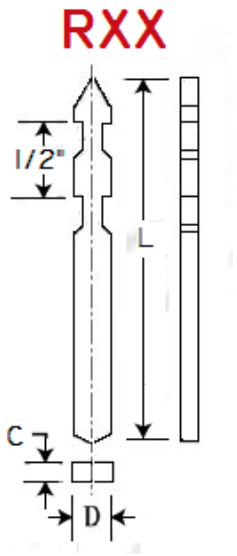
Nelson Stud Specification

Rectangular Studs



RXX FiberLok™ Stud

Nelson RXX Fiberlok™ studs and washers are a designed system to retain high temperature ceramic fiber blanket insulation to furnaces. Because of the high temperature requirements of this application, these studs and clips are not available in mild steel. The standard studs have five notches, each of which has a pitch of 1/2" (two notches per inch). Studs smaller than 3-1/2" feature only two notches. Studs can be supplied in lengths over 12" if needed.

RECOMMENDED ACCESSORIES

Installation of the retaining clips or washers is accomplished by compressing the blanket and turning the clip 90° at the bottom of a tapered notch. The resilience of the blanket pushes the clip up to the wider top portion of the notch, locking it in place.

For similar function studs, see Nelson R2P Rectangular Notched studs.

Stud Description	Minimum Length	Stud Dimensions		Required Standard Accessories			
		D	C	Ferrule	Chuck	Grip	Foot
1/8 x 1/4	3.500	0.250	0.125	100 301 014	500 005 118	501 001 006	502 001 137

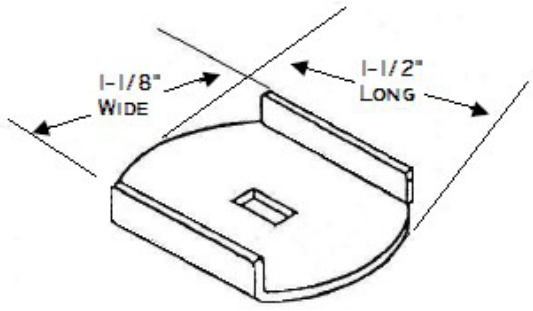
With longer RXX studs, split foot #502002045 and split grip #501003006 may be used in place of the closed grip and foot, shown below, for faster stud loading.

MATERIALS: Studs are available in Inconel 601 and 18-8 Stainless Steel. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

Fiberlok™ Washer

Fiberlok™ washers are available in high temperature alloys, and are engineered for use with RXX Fiberlok™ studs.

Alloy	Part Number	Max
304 Stainless	101 300 144	1500 °F
310 Stainless	101 300 145	2050 °F
Inconel 601	101 300 143	2300 °F
330 Stainless	101 300 148	2200 °F



1/16" thick

MATERIALS: The Fiberlok™ washer is available in the aforementioned materials. For specific grade information and physical and chemical properties, conforming standards, and information on washer plating and heat treating, please see General Material Specifi

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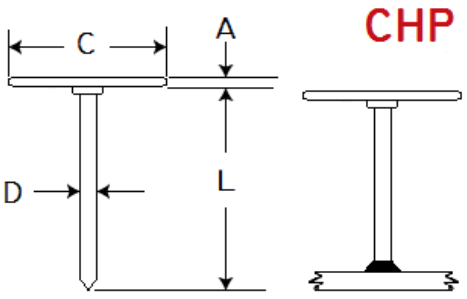
Nelson Stud Specification

Insulation Pins

CHP Cupped Head Insulation Pins



CHP studs are designed to weld through and secure blanket insulation to metal heating and air-conditioning ducts, ovens, tanks, boilers, and other hot or cold equipment. The studs are welded through the insulation for a one-step attachment. The insulation blanket may be fiberglass, rock wool, or other low-density insulation.

Cupped Head Pins may also be used to anchor sprayed or gunned-on fireproofing to structural steel members in buildings to protect them from heat in the event of a fire. This protection slows the loss of structural strength to increase the time available for evacuation, and reduces the likelihood that beams will buckle or collapse.

The pins may also be welded to cellular sheet metal deck to guarantee permanent anchorage of the sprayed fireproofing which protects electrical wires running through the cells, and provides added fire resistance per UL 263 and ASTM E119 standards, Fire Tests of Building Construction and Materials. In addition to securing the fireproofing, the pins also act as a reference gauge for the thickness of fireproofing to be applied.

For similar function studs, see Nelson TPC Single Pointed Insulation Pins, P2P Double Pointed Insulation Pins, and N3P Navy Type Annular Ring studs.

Stud Description	Pin Diameter D	Minimum Length L	Head Diameter C	A	Required Standard Accessories	
					Chuck Assembly*	Foot Assembly
12 ga.	0.105	0.500	1.187	0.021	500 015 094	503 011 050
10 ga.	0.134	1.375	1.500	0.021	500 015 095	503 011 050

* The above chucks have a 3/8" diameter shank and need to be used with chuck adapter #3521001023 to mount them on stud welding guns with female #2 Morse taper chuck adapters.

MATERIALS: CHP studs are available with Low Carbon Mild Steel shanks and galvanized sheet metal heads. For specific grade information and physical and chemical properties, please see General Material Specifications.

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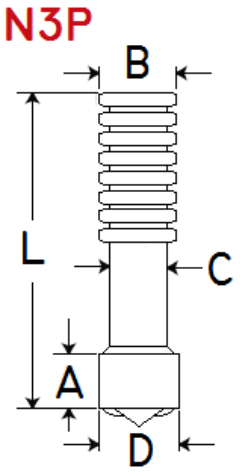
Nelson Stud Specification

Insulation Pins

N3P Navy Type Annular Ring Studs

N3P Navy pins are welded to steel for attachment of insulation. The insulation is impaled over the welded studs and retained with caps that are driven onto the studs, and lock onto the annular rings.



RECOMMENDED ACESSORIES

The flat top caps for use with N3P pins are usually supplied in aluminum. Caps can be supplied in plated mild steel or stainless steel, if needed. The standard N3P cap is shown below.

For similar function studs, see Nelson P2P Double pointed Insulation Pins, TPC Single Pointed Insulation Pins, and CHP Cupped Head Insulation Pins.

Stud Description	Minimum Length L	D	A	B	C	Required Standard Accessories			
						Ferrule	Chuck	Grip	Foot
3/16 x L	1.000	0.188	0.250	0.176	0.172	100 101 003	500 001 005	501 001 004	502 001 137*

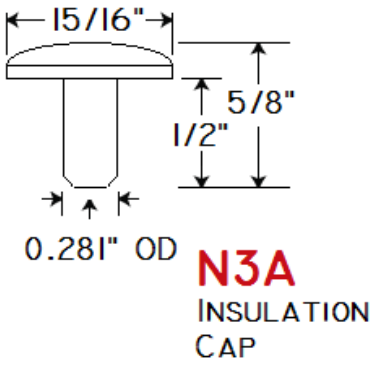
*502001137 feet used with standard duty guns. 502001001 feet used with heavy duty guns.

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

Cap for N3A and N3P Pins

Caps are used in conjunction with Nelson N3A and N3P pins to secure many types of insulation to steel plate.

Description	Part Number
Insulation Cap	101 304 021



Materials: The Navy pin cap is supplied in Anodized Aluminum. For specific grade information and physical and chemical properties, and conforming standards, please see General Material Specifications.

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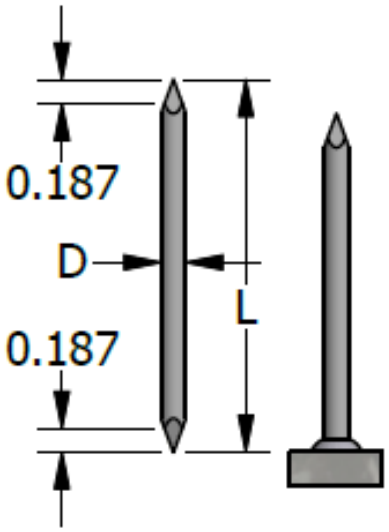
Nelson Stud Specification

Insulation Pins



P2P Double Pointed Insulation Pin

P2P studs are stud welded to structural steel to secure blanket and board insulation to ovens, tanks, boilers, and other hot or cold equipment. The insulation may be fiberglass, rock wool, or other insulation.

RECOMMENDED ACESSORIES

When used in combination with Speed Clips, the resultant system is a simple, inexpensive, and efficient method of securing insulation to metal backings. Stud length should be longer than the insulation thickness to aid in securing Speed Clips.

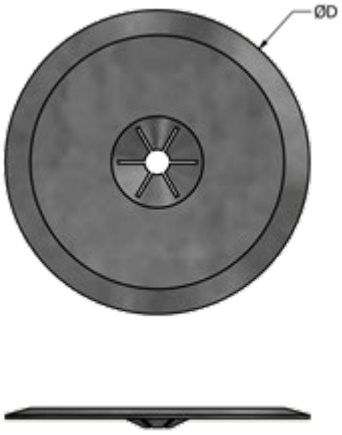
For similar function studs, see Nelson TPC Single Pointed Insulation Pins, N3P navy Type Annular Ring studs, and CHP Cupped Head Insulation pins.

Stud Description	Pin Diameter D	Minimum Length L	Required Standard Accessories			
			Ferrule	Grip	Chuck	Foot*
10 ga.	0.134	1.000	100 101 002	501 001 003	500 001 002	502 001 137

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

Speed Clips

Speed clips, when used in combination with P2P studs, secure all types of material that can be readily impaled: fiberglass, foam, felts, and corks, as well as refractory linings and light-density insulation board.



Clip Type	Clip Diameter	Steel, Plated 10 Ga.	Steel, Plated 12 Ga.	Stainless Steel, 10 Ga.
Round	1 1/2	101 301 104	101 301 102	101 301 091
Round	2	101 301 100	101 301 098	101 301 149
Square	1 1/2	101 301 112	101 301 110	101 301 070
Square	2 1/2	101 301 108	101 301 106	101 301 074
Rectangular	1 x 1 1/4	101 301 116	101 301 114	101 301 073

Speed clips have a thickness of approximate 0.021".

MATERIALS: Speed Clips are available in zinc plated Low Carbon Mild Steel and 18-8 Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

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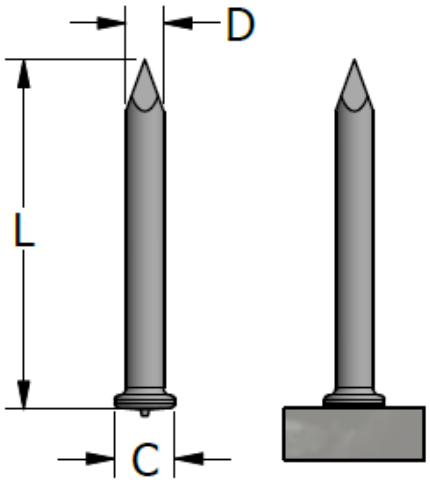
Nelson Stud Specification

Insulation Pins



TPC Single Pointed Insulation Pin

These studs are primarily designed as welded fasteners to secure blanket and board insulation to metal heating and air-conditioning duct, ovens, tanks, boilers, and other hot or cold equipment. The insulation may be fiberglass, rock wool, or other insulation. The "TP" series of insulation pins have a weld tip designed for the Capacitor Discharge welding process, but they may also be welded with the Short Cycle Drawn Arc weld process.

RECOMMENDED ACESSORIES

When used in combination with the Speed Clips, shown below, the resultant system is a simple, inexpensive, and efficient method of securing insulation to a metal backing.

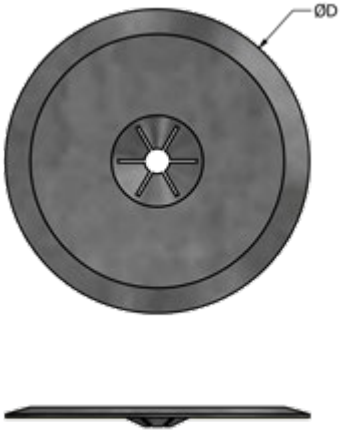
For similar function studs, see Nelson P2P Double Pointed Insulation Pins, N3P Navy Type Annular Ring studs, and CHP Cupped Head Insulation pins.

Stud Description	Pin Diameter D	Minimum Length L	C	A	Required Standard Accessories			
					Spark Shield	Chuck	Adapter	Foot
12 ga.	0.105	0.750	0.175	0.035	511 001 002	500 001 169	521 001 014	502 001 138
10 ga.	0.134	0.750	0.215	0.050	511 001 002	500 001 149	521 001 014	502 001 138

MATERIALS: Studs are available in Low Carbon Mild Steel (TPC), 18-8 Stainless Steel (TPS), and 1100 Aluminum (TPA). Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

Speed Clips

Speed clips, when used in combination with TPC studs, secure all types of material that can be readily impaled: fiberglass, foam, felts, and corks, as well as refractory linings and light-density insulation board.



Clip Type	Clip Diameter	Steel, Plated 10 Ga.	Steel, Plated 12 Ga.	Stainless Steel, 10 Ga.
Round	1 1/2	101 301 104	101 301 102	101 301 091
Round	2	101 301 100	101 301 098	101 301 149
Square	1 1/2	101 301 112	101 301 110	101 301 070
Square	2 1/2	101 301 108	101 301 106	101 301 074
Rectangular	1 x 1 1/4	101 301 116	101 301 114	101 301 073

Speed clips have a thickness of approximate 0.021".

MATERIALS: Speed Clips are available in zinc plated Low Carbon Mild Steel and 18-8 Stainless Steel. Other materials are available by special order. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

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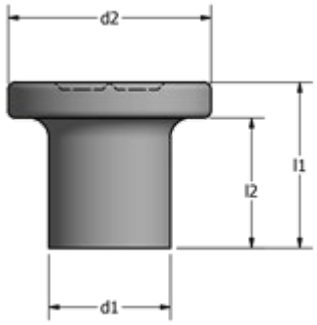
Nelson Stud Specification

Miscellaneous

T-Stud

Nelson “T” trim studs are welded to either bare or corrosion protection treated steel sheet metal for automotive applications. An extensive series of plastic and metal clips is available for use in conjunction with the “T” stud. The clips are retained by the head of the stud to perform a variety of functions, like retaining wires, tubes, hoses, trim strips, and even windows.



They are also used in the appliance and other sheet metal industries for similar applications. Due to the small size of these studs, Nelson “T” studs are normally welded using Nelson automatic feed stud welding systems.

New “T” stud sizes and shapes can be produced for specific requirements. Please see Nelson’s Cold Heading Compatibility Specifications for additional information on cold-headed parts.

For similar function studs, see Nelson ANC Unthreaded Stored Arc™ studs, ATC Threaded Stored™ Arc studs, AXC Fir Tree studs, “W” Top Wide Flange studs, and Grounding studs.

Stud Diameter	Overall Length	Head Diameter	Shank Length	Required Standard Accessories	
D1	L1	D2	L2	Chuck	Foot
0.197	0.393	0.354	0.323	500 001 269	
Metric					
3	4.00	5.05	3.00	500 001 132	
3	4.15	5.05	3.00	500 001 132	
3	5.40	5.05	4.35	500 001 132	
5	10.00	9.00	8.20	200 001 269	

MATERIALS: Studs are available in Low Carbon Mild Steel and 18-8 Stainless Steel. Copper plating is an available option for this stud. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating and heat treating, please see General Material Specifications.

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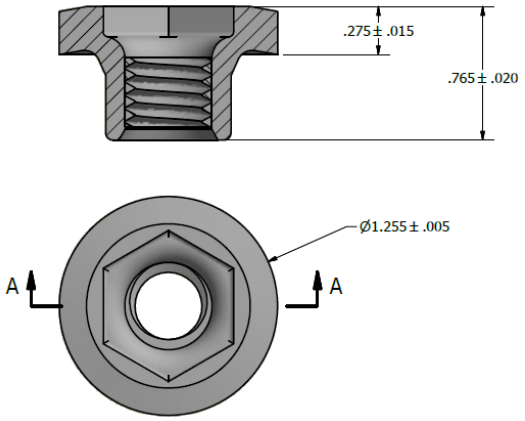
Nelson Stud Specification

Miscellaneous

Watertight Nuts

Nelson 1/2-13 watertight nuts are used to attach wood decking to the railroad car floors or aircraft carrier decks. They are installed on standard Nelson CPL threaded studs. The CPL studs can be welded through pre-drilled holes in the wood by using ferrule tubing and long style chucks.



It is this application that prompted Ted Nelson to develop the stud welding process in 1939. His solution of stud welding through holes in wood, plastic, or other materials to steel base plate is still the quickest and most effective method of fabricating a variety of assemblies.

Nelson Watertight nuts are available with or without or zinc plated steel. They can be supplied with normal or locking threads. This self-locking feature is desirable on wood, which may expand and contract with changes in temperature or exposure to moisture. Railroad cars are also subject to severe vibration, which may loosen nuts, thus making the locking threads capability desirable in this application

These nuts can also be used to install thick UHMW plastic sheets.

In addition to Nelson watertight nuts, specialty nuts can also be supplied for use on 1/4-20, 3/8-16, and 1/2-13 threaded studs. Drive tool #518015000 is necessary for the installation of Watertight Nuts

For similar function studs, see Nelson CPL Partially Threaded studs and CFL Fully Threaded studs.

Part Description	Plating	Part Number
1/2-13 Watertight nut with self-locking	Yes	101 302 274
1/2-13 Watertight nut with self-locking	No	101 302 244
1/2-13 Watertight nut with non-locking	Yes	101 302 256
1/2-13 Watertight nut with non-locking	No	101 302 243

MATERIALS: Watertight Nuts are available only in Mild Steel. For specific grade information and physical and chemical properties, conforming standards, and information on plating and heat treating, please see General Material Specifications.

PLATING: Watertight Nuts can be electrozinc plated to ASTM B633, Fe/Zn 8.

THREADS: Standard internal threads are UNC-2B.

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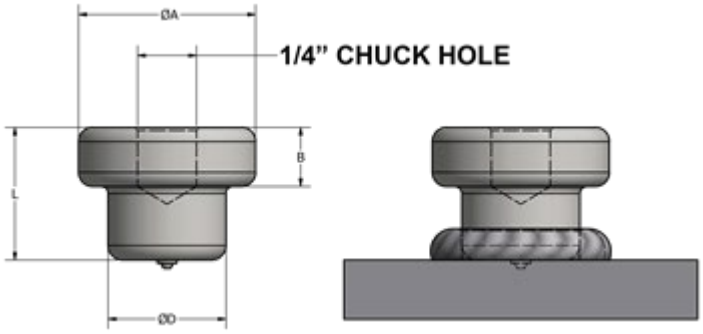
Nelson Stud Specification

Miscellaneous

H8L, H8X Dowel Pin Stud

The Nelson H8L studs are welded to automobile and truck axle housing. These short studs fit into holes on the spring or spring suspension systems. The H8L studs have a reduced weld base diameter and are welded using ceramic ferrules.

The ferrules used with H8L studs feature an inverted internal cavity. This restricts the weld flash and should insure that the welded stud will fit properly into the spring housing hole. Globally axle housing producers have standardized these hole sizes.



For similar function studs, see Nelson NBL studs.

Stud Diameter D	Burn Off	L	B	D	Required Standard Accessories			
					Chuck	Foot *	Grip	Ferrule
5/8	0.125	0.469	0.188	0.438	500 003 012	502 002 002	501 010 117	100 108 008
3/4	0.125	0.523	0.188	0.438	500 003 012	502 002 002	501 010 117	100 107 002
3/4	0.125	0.563	0.250	0.500	500 003 012	502 002 002	501 010 118	100 108 019

* Foot 502 002 002 is used with Nelson's heavy duty gun.

MATERIALS: Dowel Pin Studs are available only in Mild Steel. For specific grade information and physical and chemical properties, conforming standards, and information on plating and heat treating, please see General Material Specifications.

PLATING: Dowel Pin Studs can be electrozinc plated to ASTM B633, Fe/Zn 8.

THREADS: Standard internal threads are UNC-2B.

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Nelson Stud Specification

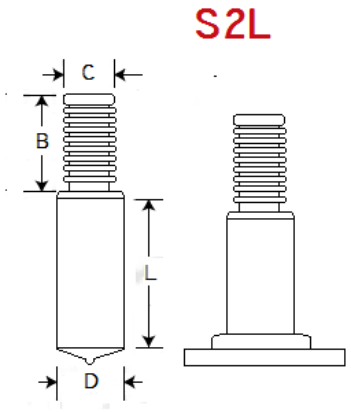
Miscellaneous

S2L Setlok Studs

Nelson S2L studs are welded to the structural steel on spacing that matches the pitch of the corrugated sheet metal. The Nelson S2L and Setlok cap system provides a quick, reliable and weatherproof roof or wall construction system. These studs and caps are also used to cover and insulate oil storage tanks.

5/16” impression speed clips, #301001008, are used to retain the insulation until the flat or corrugated covering sheet is applied.

For similar function studs, see Nelson N3P Navy Type Annular Ring Insulation Pins.



Stud Diameter D	C	B*	Length L	Required Standard Accessories			
				Ferrule	Ferrule Grip	Chuck	Foot
5/16	0.187	0.375	0.687	501 101 007	501 001 001	500 001 006	502 001 137
5/16	0.187	0.375	0.968	501 101 007	501 001 001	500 001 006	502 001 137

*B length for 4 laps of 18-gauge material is 0.437”

Length described above is before weld length. The 0.687” length is for all 2-2/3” pitch corrugated steel studs. The 0.968” length is for all 0.032”, 2-2/3” pitch corrugated aluminum studs.

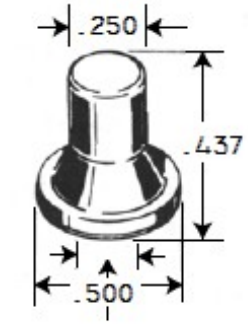
MATERIALS: Studs are available in Low Carbon Mild Steel and Stainless Steel. For specific grade information, physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

RECOMMENDED ACESSORIES SPECIFICATION

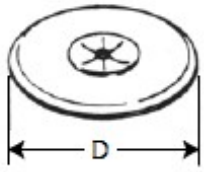
Setlok Caps and Speed Clips

Nelson Setlok Caps are engineered for use in conjunction with Nelson S2L Setlok studs to provide a weatherproof securing option. A rubber-faced hammer is used to impale the sheet metal over the ends of the studs. After the annular rings are exposed, a setting tool and hammer are used to lock the caps onto the studs.

Speed clips can be used in combination with S2L studs to temporarily retain all types of material that can be readily impaled (fiberglass, foam, felts, and corks, as well as refractory linings and light-density insulation board) until the sheet metal and caps are installed.



ROUND IMPRESSION



Accessory Description	Pin size C	Clip Diameter D	Clip Thickness	Part Number
Setlok Cap	3/16	1/2	0.437	101 304 001
Setlok Speed	5/16	1-3/8	0.021	101 301 008
Setlok Setting Tool	--	--	--	505 001 012

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Nelson Stud Specification

Miscellaneous

CrimpLok™ Cable Hangers

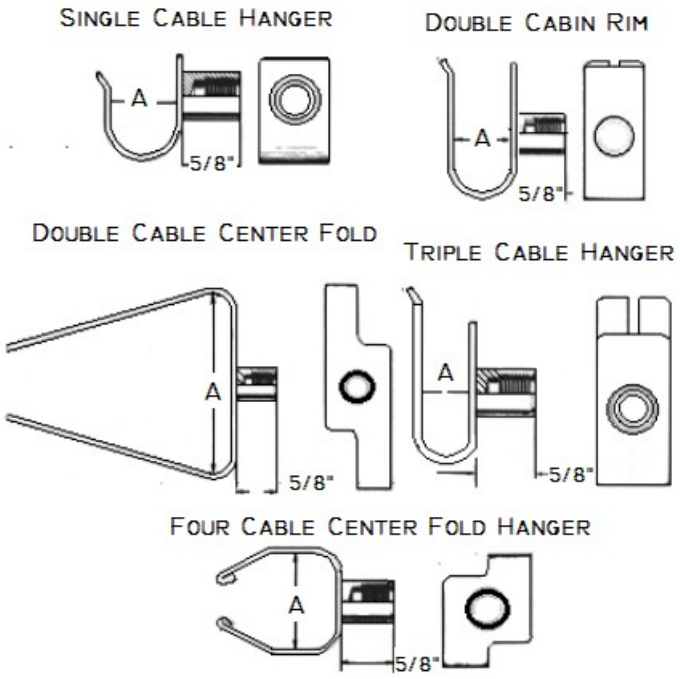
Nelson marine hangers are generally used in the shipbuilding industry to support and retain electrical cables. They are mounted on CPL studs that have been welded to the ship's structure. The hangers have been vibration tested, and are United States Navy approved.

CrimpLok™ style hangers are crimped directly onto the cables to retain them, and are made from stainless steel or mild steel with an electrozinc or neoprene coating option.

Nelson's CrimpLok™ marine cable hangers combine the split-second fastening capabilities of stud welding with a proven method of cable attachment. The hanger has enough design flexibility to handle different diameters and quantities of cables, yet has very desirable mounting simplicity and speed.

The use of Nelson's studs and marine cable hangers allows painting and insulation to be installed prior to permanent cable installation, thus reducing time spent on overall component installation.

All studs cable hangers, seen above, are tapped 3/8"-16.



For similar function studs, see Nelson Banding style cable hangers.

Part Description	A	Cable Diameter	
		Minimum	Maximum
Single Cable Hanger			
SL0103-TXL	0.531	0.375	0.531
SL0105-TXL	0.680	0.531	0.680
SL0106-TXL	0.900	0.680	0.900
SL0107-TXL	1.224	0.900	1.224
SL0114-TXL	0.750	0.437	0.750
SL0131-TXL	0.371	0.305	0.371
Double Rim Fold Hanger			
SL0109-TXL	0.531	0.375	0.531
SL0110-TXL	0.680	0.531	0.680
SL0111-TXL	0.900	0.680	0.900
SL0115-TXL	0.750	0.437	0.750
SL0117-TXL	1.000	0.750	1.000
SL0132-TXL	0.371	0.305	0.371

Part Description	A	Maximum Cable Diameter
Double Center Fold Cable Hanger		
SL0104-TXL	3.000	0.500
SL0122-TXL	3.000	0.750
SL0123-TXL	2.000	1.000
SL0121-TXL	2.448	1.224
Triple Cable Rim Fold Hanger		
SL0124-TXL	0.531	0.531
Four Cable Center Fold Hanger		
SL0102-TXL	1.000	0.531

MATERIALS: Nelson cable hangers are available in Low Carbon Mild Steel and Stainless Steel. Options for electro-zinc plating and Neoprene coating are available. For specific grade information and physical and chemical properties, conforming standards, and information on stud plating, please see General Material Specifications.

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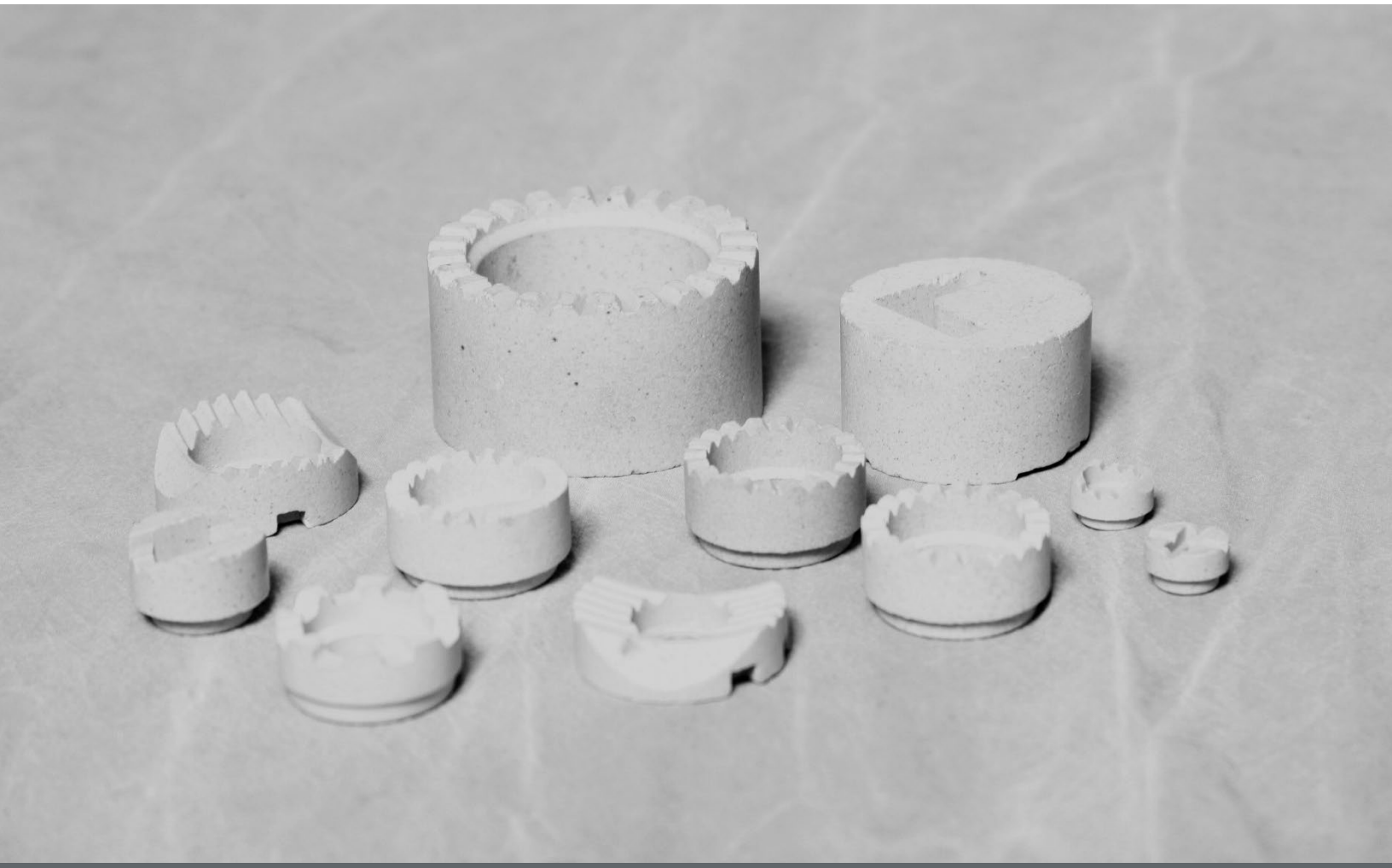
NELSON®

2020 Ceramic Ferrules



Using the 2020 Nelson Stud Welding, Inc. Electronic Catalog

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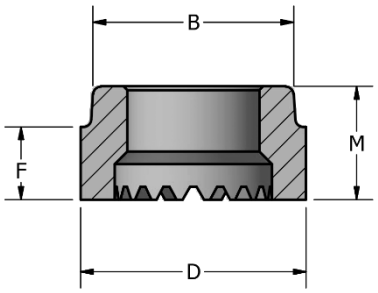
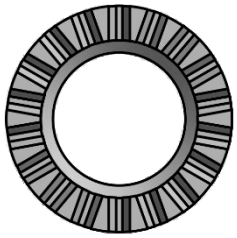
Nelson Ferrule Specification

Standard Ferrules

Ceramic ferrules are an essential part of the standard drawn arc stud welding process. They are designed to encircle the weld stud to protect the weld arc and limit it to a specific area of the base material. They also contain the molten weld metal and act as a mold to give a uniform shape to this metal, also called the weld flash. The term, weld flash, is used to distinguish the weld metal at the base of a stud from the weld by other arc welding processes, which is called weld fillet.

These ferrules are intended for welding round studs perpendicular to flat surfaces.





Full Base

These are standard ferrules supplied with the full weld base NBL, TBL, H4L, S3L, and D2L studs

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
#6	0.138	0.281	0.375	0.234	0.390	100 101 001
#8	0.164	0.291	0.375	0.234	0.390	100 101 002
#10	0.187	0.305	0.390	0.234	0.390	100 101 003
1/4	0.250	0.505	0.640	0.286	0.437	100 101 067
5/16	0.312	0.445	0.578	0.234	0.390	100 101 007
3/8	0.375	0.650	0.795	0.228	0.390	100 101 099
7/16	0.437	0.585	0.703	0.234	0.422	100 101 009
1/2	0.500	0.785	0.875	0.228	0.438	100 101 114
9/16	0.562	0.785	1.030	0.328	0.515	100 101 039
5/8	0.625	1.030	1.150	0.339	0.526	100 101 187
3/4	0.750	1.030	1.215	0.469	0.656	100 101 152
13/16	0.813	1.210	1.735	0.260	0.464	100 101 178
7/8	0.875	1.210	1.413	0.545	0.732	100 101 140
1	1.000	1.406	1.610	0.633	0.820	100 101 045
1-1/8	1.125	1.541	1.765	0.503	0.815	100 101 143
1-1/4	1.250	2.015	2.015	1.030	1.030	100 101 146

Full Base – Thin Wall

These special order ferrules are available for full base studs to accommodate special situations or fixturing.

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
1/4	0.250	0.380	0.455	0.265	0.390	100 101 006
3/8	0.375	0.505	0.640	0.234	0.390	100 101 008
1/2	0.500	0.650	0.795	0.250	0.438	100 101 010
5/8	0.625	0.785	1.030	0.328	0.515	100 101 012

To determine the ferrule grips, ferrule holders, or ferrule tubes that can be used with specific ferrule types, look at the neck diameter (inside diameter) of the ferrule, then look in the accessories catalog for ferrule grips, holders, or tubes to match that inside diameter.

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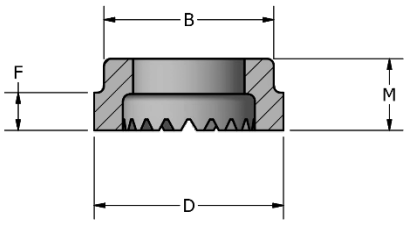
Nelson Ferrule Specification

Standard Ferrules

Full Base – Low Profile, F-139

Stud lengths shorter than those shown above can be supplied in sizes 1/4"-20 through 1/2"-13 by using special low profile ceramic ferrules. All low profile ferrules, except the 1/4”-20 ferrule, were designed for use with full diameter weld base studs. For this reason, the weld flash size and flash clearance are increased. The minimum length, recommended weld flash clearance, ferrules, and ferrule grip numbers are shown below.



Thread Size	Minimum Stud Length	Weld Flash Size		Flash Clearance	Required Accessories For Short Studs			
		E	F		Ferrule	Grip	Chuck	Foot
1/4-20	0.640	0.359	0.109	0.437	100 101 077	501 001 005	500 001 007	502 001 137
5/16-18	0.640	0.437	0.109	0.500	100 101 030	501 001 007	500 001 009	502 001 137
3/8-16	0.687	0.500	0.125	0.593	100 101 031	501 001 008	500 001 011	502 001 137
7/16-14	0.687	0.593	0.140	0.656	100 101 032	501 001 009	500 001 012	502 001 137
1/2-13	0.750	0.687	0.156	0.750	100 101 033	501 001 001	500 001 014	502 001 138

Full base – Low Profile, F-139 - These ferrules are available for short studs

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number	Minimum Stud Length
#10	0.187	0.305	0.390	0.125	0.250	100 101 063	0.625
1/4	0.250	0.370	0.455	0.125	0.250	100 101 077	0.640
5/16	0.312	0.505	0.596	0.125	0.250	100 101 030	0.640
3/8	0.375	0.585	0.675	0.125	0.250	100 101 031	0.687
3/8	0.375	0.785	0.875	0.160	0.285	100 101 101	0.718
7/16	0.437	0.650	0.740	0.125	0.281	100 101 032	0.687
1/2	0.500	0.785	0.875	0.174	0.330	100 101 033	0.750
1/2	0.500	0.921	1.030	0.125	0.312	100 101 119	0.718
5/8	0.625	0.921	1.030	0.187	0.375	100 101 126	0.813
3/4	0.750	1.210	1.413	0.203	0.390	100 101 133	0.875

To determine the ferrule grips, ferrule holders, or ferrule tubes that can be used with specific ferrule types, look at the neck diameter (inside diameter) of the ferrule, then look in the accessories catalog for ferrule grips, holders, or tubes to match that inside diameter.

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Nelson Ferrule Specification

Standard Ferrules

Threaded Pitch Diameter, F-239

These ferrules are used with CPL type studs

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
1/4-20	0.215	0.380	0.455	0.125	0.250	100 101 034
5/16-18	0.275	0.445	0.535	0.125	0.250	100 101 035
3/8-16	0.330	0.505	0.595	0.139	0.264	100 101 036
7/16-14	0.388	0.585	0.675	0.173	0.329	100 101 037
1/2-13	0.448	0.650	0.740	0.206	0.362	100 101 038
5/8-11	0.562	0.785	0.905	0.277	0.433	100 101 039
3/4-10	0.680	1.030	1.150	0.339	0.526	100 101 040
7/8-9	0.797	1.210	1.330	0.406	0.593	100 101 041
1-8	0.915	1.406	1.526	1.474	0.661	100 101 042

Full Threaded, F-107

These ferrules are used with CFL studs. For short studs, see low profile options in CFL catalog sheet.

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
5/16-18	0.312	0.445	0.578	0.281	0.437	100 101 024
3/8-16	0.375	0.505	0.640	0.281	0.437	100 101 025
7/16-14	0.437	0.585	0.703	0.281	0.469	100 101 026
1/2-13	0.500	0.650	0.795	0.281	0.469	100 101 027
5/8-11	0.625	0.785	1.030	0.390	0.579	100 101 028
3/4-10	0.750	1.030	1.180	0.390	0.595	100 101 029

To determine the ferrule grips, ferrule holders, or ferrule tubes that can be used with specific ferrule types, look at the neck diameter (inside diameter) of the ferrule, then look in the accessories catalog for ferrule grips, holders, or tubes to match that inside diameter.

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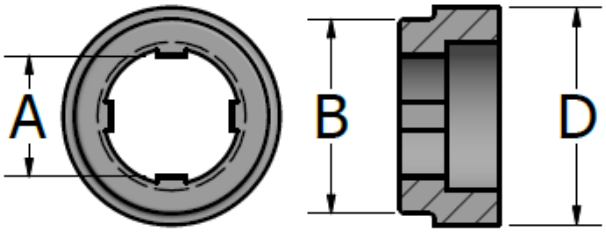
Nelson Ferrule Specification

Flash Form Ferrules®

For certain applications, tolerances on flash around the base of the welded stud may be critical in joining components. *Flash Form Ferrules®* produce a uniform 360° flash that not only eliminates variation in flash but also "weld berries" and "spider legs" that occur when molten metal escapes through the vents of standard ferrules.



Having a more uniform flash ring around the stud base also provides the added benefit of easing the visual inspection code requirement.

Full Base						
Nominal Stud Size	**Inside Diameter A**	**Grip Neck Diameter B**	**Major Diameter D**	**Effective Height F**	**Ferrule Part Number**	**Replaces Standard Ferrule**
1/4	0.250					100 101 067
5/16	0.312					100 101 007
3/8	0.375	0.785	0.875	0.405	100 109 032	100 101 099
1/2	0.500	0.785	0.875	0.356	100 109 033	100 101 114
5/8	0.625	1.030	1.165	0.541	100 109 034	100 101 187
3/4	0.750	1.210	1.428	0.699	100 109 024	100 101 152
7/8	0.875	1.406	1.625	0.747	100 109 031	100 101 140
1	1.000	1.406	1.625	0.835	100 109 030	100 101 045

Pitch Base						
Nominal Stud Size	**Inside Diameter A**	**Grip Neck Diameter B**	**Major Diameter D**	**Effective Height F**	**Ferrule Part Number**	**Replaces Standard Ferrule**
5/16	0.275	0.785				100 101 035
3/8	0.330	0.785	0.875	0.250	100 109 025	100 101 036
1/2	0.448	0.785	0.920	0.397	100 109 039	100 101 038
5/8	0.562	1.030	1.165	0.448	100 109 040	100 101 039
3/4	0.680	1.030	1.165	0.541	100 109 038	100 101 040
7/8	0.798					100 101 041
1	0.914					100 101 042

Welding to Vertical Surfaces						
Nominal Stud Size	**Inside Diameter A**	**Grip Neck Diameter B**	**Major Diameter D**	**Effective Height F**	**Ferrule Part Number**	**Replaces Standard Ferrule**
3/4	0.750	1.030	1.210	0.676	100 109 026	100 101 226
7/8	0.875	1.210	1.428	0.747	100 109 035	100 101 235
1	1.000	1.406	1.625	0.835	100 109 036	NA

To determine the ferrule grips, ferrule holders, or ferrule tubes that can be used with specific ferrule types, look at the neck diameter (inside diameter) of the ferrule, then look in the accessories catalog for ferrule grips, holders, or tubes to match that inside diameter.

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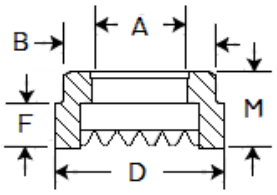
Nelson Ferrule Specification

Non-Standard Ferrules

These ferrules are intended for welding round studs to flat surfaces in special applications.



Collar Studs, F-172

These ferrules are used with CKL type studs

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
#10-24, 32	0.187	0.650	0.740	0.090	0.195	100 101 060
1/4-20	0.215	0.785	0.875	0.095	0.235	100 101 066
5/16-18	0.275	0.785	0.875	0.095	0.235	100 101 073
3/8-16	0.330	0.785	0.875	0.095	0.250	100 101 083
1/2-13	0.448	0.921	1.030	0.125	0.250	100 101 118

Reduced Base, F-106

These ferrules are used with CJL and NJL type studs

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
#10	0.187	0.305	0.305	0.234	0.390	100 101 015
1/4	0.250	0.380	0.455	0.175	0.390	100 101 016
5/16	0.312	0.445	0.578	0.281	0.437	100 101 017
3/8	0.375	0.505	0.640	0.281	0.437	100 101 018
1/2	0.500	0.650	0.795	0.327	0.515	100 101 020
5/8	0.625	0.785	1.030	0.391	0.579	100 101 021
3/4	0.750	0.921	1.100	0.391	0.595	100 101 022

Aluminum Ferrules, F-250

These aluminum ferrules are intended for welding round studs perpendicular to flat surfaces

These ferrules are used with HBA, CKA, TBA, and NBA type studs

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height Overall M	Ferrule Part Number
3/16	0.187	0.750	0.750	0.250	100 101 046
1/4	0.250	0.750	0.750	0.250	100 101 047
5/16	0.312	0.750	0.750	0.250	100 101 048
3/8	0.375	1.000	1.000	0.385	100 101 049
7/16	0.437	1.000	1.000	0.385	100 101 050
1/2	0.500	1.000	1.000	0.385	100 101 051

NOTE: As there is no F dimension within the chart, disregard it within the drawing.

To determine the ferrule grips, ferrule holders, or ferrule tubes that can be used with specific ferrule types, look at the neck diameter (inside diameter) of the ferrule, then look in the accessories catalog for ferrule grips, holders, or tubes to match that inside diameter.

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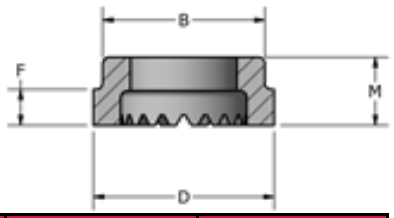
Nelson Ferrule Specification

Non-Standard Ferrules

These ferrules are intended for welding round studs to flat surfaces in special applications.



Low Profile

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
1/2	0.500	0.785	0.875	0.125	0.281	100 101 115

Special Collar

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
1/2-13	0.448	1.062	1.187	0.125	0.281	100 101 122
1/2-13	0.448	1.030	1.187	0.125	0.281	100 101 239
3/4-10	0.680	1.030	1.150	0.296	0.483	100 101 135

Special Short CFL, Full Threaded

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
3/8-16	0.375	0.505	0.615	0.132	0.250	100 101 083

Non-Skid, Heavy Duty

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
5/16	0.312	0.650	0.795	0.228	0.390	-
1/2-13	0.448	0.785	0.905	0.114	0.362	100 101 202

Short, Heavy Duty

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
3/8	0.375	0.650	0.795	0.125	0.250	100 101 225

3/4 Special, Small Vent

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
3/4	0.750	1.030	1.215	0.469	0.656	100 101 232

Special

Nominal Stud Size	Inside Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
10 ga.	0.134	0.260	0.260	0.385	0.385	100 101 233

To determine the ferrule grips, ferrule holders, or ferrule tubes that can be used with specific ferrule types, look at the neck diameter (inside diameter) of the ferrule, then look in the accessories catalog for ferrule grips, holders, or tubes to match that inside diameter.

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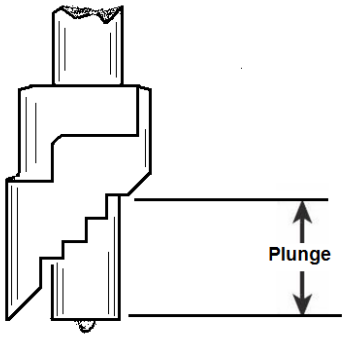
Nelson Ferrule Specification

Special Applications

Angled Ferrules Welding at an Angle to a Base Plate



Studs need to be welded at an angle on embedment plates. Special ferrules are used to prevent binding in the neck of the ferrule, and to achieve consistent results.

45° welding requires the use of a fixture or stop to prevent the ferrules from moving during the weld cycle. Heavy-duty guns need to be used to get sufficient gun travel. When the plunge is being taken up, the gun must be manually retracted to prevent binding and breaking of ferrules.

The ferrule grip listed below for the 3/8” studs at 23° angles is not a split grip. The ferrule grips for 3/8” and 1/2" studs at 45° angles are special split grips. Split ferrule grips are essential when welding headed studs and they simplify loading of long D2L studs. The ferrule outside diameters listed below should be used when the fixtures or stops to prevent sliding are fabricated.

Stud Diameter A	Angle Degree	Ferrule Neck Diameter	Grip	Ferrule Part Number	Ferrule OD[1]
3/8	23	0.50	501 001 007*	100 104 010	0.656
3/8	45	0.65	501 009 006	100 104 007	0.813
1/2	45	0.78	501 009 008	100 104 008	1.045

*Standard 3/8” grip #501-001-007 with ear bent out can also be used

[1] Ferrule OD clearance for stop or fixture.

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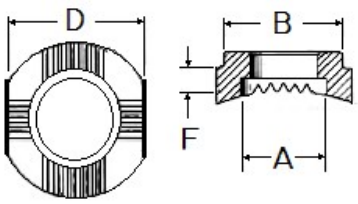
Nelson Ferrule Specification

Special Applications



Concave Ferrules for Welding to Curved Surfaces

For many applications, studs must be welded to the outside of curved surfaces of cylinders, tubes, pipes, or formed metal parts. In order to achieve good weld results when stud welding to a convex surface, the ferrule must fit both the stud diameter and the curve of the base material.

Standard Concave Ferrules						
Nominal Stud Size	Inside Diameter A	Weld Surface Curve Diameter	Effective Height F	Grip Neck Diameter B	Major Diameter D	Ferrule Part Number
1/4	0.250	3/8	0.380	0.380	0.555	100 102 005
5/16	0.312	3/8	0.250	0.505	0.595	100 102 054
0.330	0.330	1/2	0.303	0.585	0.703	100 102 051
3/8	0.375	3/4	0.235	0.785	0.875	100 102 093
3/8	0.375	7/8	0.312	0.505	0.585	100 102 012
3/8	0.375	7/8	0.437	0.505	0.640	100 102 046
3/8	0.375	1 3/4	0.343	0.505	0.640	100 102 091
3/8	0.375	3	0.343	0.505	0.640	100 102 092
1/2	0.500	1 1/4	0.312	0.785	0.875	100 102 025
1/2	0.500	1 5/8	0.437	0.650	0.806	100 102 023
1/2	0.500	3	0.437	0.650	0.806	100 102 019
1/2	0.500	3	0.437	0.785	0.875	100 102 021
1/2	0.500	3	0.680	0.650	0.796	100 102 081
1/2	0.500	3 1/2	0.250	1.615	1.615	100 102 090
1/2	0.500	3 1/2	0.312	0.921	1.125	100 102 026
0.590	0.590	1 7/8	0.493	0.785	1.030	100 102 082
5/8	0.625	3/4	0.495	0.785	1.030	100 102 095
5/8	0.625	1	0.515	0.785	1.030	100 102 029
5/8	0.625	2	0.495	0.785	1.030	100 102 030
5/8	0.625	2 5/8	0.340	1.615	1.615	100 102 085
5/8	0.625	4	0.320	1.615	1.615	100 102 084
5/8	0.625	4	0.515	0.785	1.030	100 102 032
5/8	0.625	3 3/4	0.340	1.615	1.615	100 102 084
0.680	0.680	1	0.437	1.030	1.140	100 105 007
3/4	0.750	2 9/16	0.532	1.030	1.187	100 102 038
7/8	0.875	3 3/4	0.465	1.615	1.615	100 102 086
1	1.000	3	0.813	1.406	1.615	100 102 087

Concave Ferrules for Reduced Base Studs *							
Nominal Stud Size	Inside Diameter A	Reduced Base Diameter	Weld Surface Curve Diameter	Effective Height F	Grip Neck Diameter B	Outer Diameter D	Ferrule Part Number
11/16	0.688	7/16	1 1/8	0.990	0.875	0.406	100 102 005
11/16	0.688	7/16	2	0.990	0.875	0.406	100 102 054
13/16	0.813	9/16	2	0.562	1.062	1.180	100 102 051
13/16	0.813	9/16	2 3/4	0.562	1.062	1.180	100 102 051

* Reduced weld base diameters are often needed on pipe and port fittings

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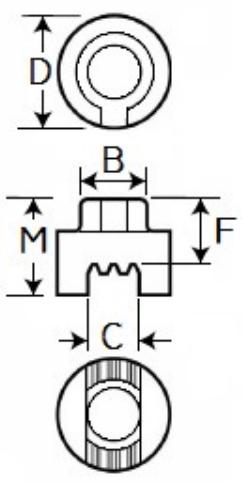
Nelson Ferrule Specification

Special Applications

Welding to Edges of Base Plates

Over the years, Nelson Stud Welding has developed several ferrules that permit welding of full base studs to the edges of plate or bars that are the same thickness as the stud diameter.



These ferrules are constructed with ears or tabs, which extend down over the sides of the base material, and with vents and a cavity that is limited to the base material thickness. Due to the limited base material width, the weld cavities are run along the edge for a distance greater than the normal flash diameter used for welding studs perpendicular to flat plates. This special ferrule design allows development of full stud strength when welding to the edges of plates or bars.

The neck diameters of the ferrules are shown to assist in the selection of ferrule tube, ferrule holders, and foot plates.

Stud Diameter A	Base Material Thickness C	Ferrule Neck Diameter B	Major Diameter D	Effective Height F	Overall Height M	Ferrule Part Number
1/4	1/4	0.380	0.555	0.468	0.468	100 101 223
3/8	3/8	0.650	0.795	0.562	0.577	100 101 204
1/2	1/2	0.785	1.030	0.625	0.640	100 101 205

The 3/8” and the 1/2" ferrules have standard necks, while the neck of the 1/4" ferrule has an orientation key on the neck. The key on the 1/4" ferrule requires either bending up one of the narrow gripping tines on the standard 1/4" ferrule grip, #501001005, or the use of a special 1/4" grip, #501008005, which has two notches in it to accept the key on the neck of the ferrule, as well as the two normal gripping tines.

The #100101223 ferrule has the orientation key because it was designed for use with a production unit, where the ferrule must be aligned with the base material. The 3/8” and 1/2" ferrules without the key on the neck were designed for use with hand held guns, where the gun can be turned to align the ferrule with the base material.

These ferrules are designed for use with Nelson full base diameter studs. This includes H4L, S3L, D2L, NBL, TBL, and other stud styles having full diameter weld bases.

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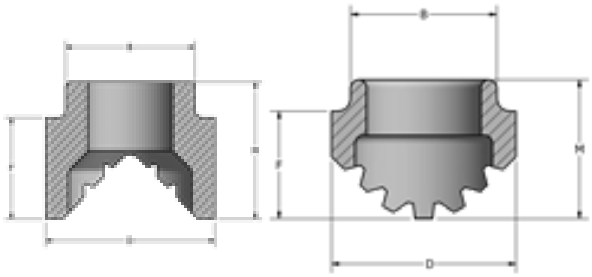
Nelson Ferrule Specification

Special Applications

Special Ferrule for Welding into Fillets and Onto Heels

The radius of the tip of these ferrules is important. The radius of the ferrules needs to match the radius on the angle to which the studs are to be welded in order to properly shield the weld arc and prevent the loss of metal.



If the radius inside the angle cannot be determined, it is better to select the ferrule with the larger radius since it is less detrimental to have a gap at the center of the angle than along both edges of the angle.

Into Fillet - Inside Corner of 90° Angle

Stud Diameter A	Radius R	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number	Split Ferrule Grips	
							2”	3”
1/4”	0.125	0.380	0.578	0.350	0.500	100 106 001	501 004 003	-
3/8”	0.250	0.505	0.640	0.375	0.480	100 106 002	501 004 006	-
1/2”	0.250	0.650	0.687	0.795	0.500	100 103 009	501 004 008	501 004 013
1/2”	0.375	0.650	0.795	0.500	0.688	100 103 011	501 004 008	501 004 013
1/2”	0.750	0.650	0.795	0.500	0.688	100 103 008	501 004 008	501 004 013
5/8”	0.375	0.785	1.030	0.687	0.875	100 106 005	501 004 009	-
3/4”	0.750	1.030	1.218	0.687	0.875	100 103 012	501 004 014	-
3/4”	0.375	1.030	1.218	0.562	0.937	100 106 004	501 004 014	-

Onto Heel - Outside Corner of 90° Angle

Stud Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number	Split Grip
1/4”	0.380	0.555	0.125	0.380	100 102 005	501 003 005
3/8”	0.585	0.703	0.550	0.706	100 105 001	501 003 008
1/2”	0.785	1.030	0.625	0.812	100 105 002	501 003 010
5/8”	0.785	1.030	0.703	0.891	100 105 003	501 003 010
3/4”	1.030	1.215	0.844	1.031	100 105 005	501 003 014

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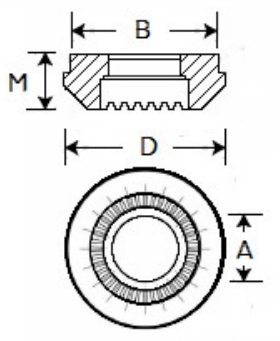
Nelson Ferrule Specification

Special Applications



Special Ferrules for Stripping Straight Off Headed Studs

Welding of concrete anchors and shear connectors into holes through concrete, masonry, or wood, is a special application of Nelson studs. For these applications, a ferrule is needed with a neck diameter that is larger than the head on the stud. This allows the gun to be stripped straight off the welded studs.

The ferrules listed below have gripping neck diameters that are larger than the heads of the concrete anchors or shear anchors.

The 3/8” and 1/2” ferrules can also be used as Low Profile ferrules with special Collar studs that have full diameter weld bases.

Stud Diameter A	Stud Head Diameter	Ferrule Gripping Neck Diameter* B	Major Diameter D	Overall Height M	Ferrule Part Number
3/8"	0.750	0.785	0.875	0.281	100 101 101
1/2"	1.000	-	-	-	100 101 259
5/8"	1.250	1.406	1.531	0.531	100 101 182
3/4"	1.250	1.406	1.531	0.656	100 101 228
7/8"	1.375	1.406	1.531	0.732	100 101 215

* The neck diameters of the ferrules are shown to assist in the selection of ferrule tube, ferrule holders, and foot plates.

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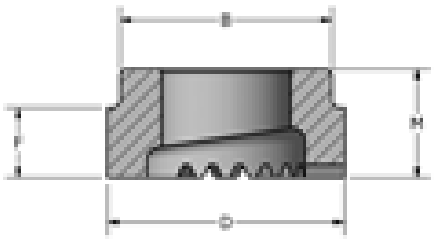
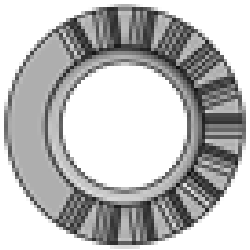
Nelson Ferrule Specification

Special Applications





Special Ferrules for Welding to Vertical Surfaces

When welding to a vertical surface, gravity causes molten metal to flow to the bottom side of the ferrule. There is an increased tendency toward metal loss through the ferrule vents, and it is more difficult to displace the metal to the top of the weld. This is important for the development of a full flash with no undercut produced.

On small diameters, vertical welding presents no real problem. The weld time is short, and there is not much molten metal produced.

However, because longer welding times are required to weld larger diameter studs, more molten metal is produced in the process. With more molten metal, welding to a vertical surface proves to be more difficult with a larger diameter stud. The use of standard ceramic ferrules resulted in poor weld flash formation on the “top side” of the weld fillet, and excessive metal loss out of the vents at the bottom of the ferrule.

Ferrules specifically designed for vertical plate stud welding have blocked vents at the bottom of the ferule cavity and other features to prevent weld metal loss, and deposit more of the flash metal at the top of the weld.

Stud Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Part Number
0.500 and under	No Special Ferrule is Needed				
0.562	0.785	0.905	0.277	0.433	100 101 234
5/8	1.030	1.150	0.339	0.526	100 101 224
0.680	1.030	1.150	0.339	0.526	100 101 214
3/4	1.030	1.215	0.486	0.676	100 101 226
7/8	1.210	1.410	0.545	0.836	100 101 235

The neck diameters of the ferrules are shown to assist in the selection of ferrule tube, ferrule holders, and foot plates.

7/8” ferrule, #100101235, is not recommended since it may not always produce a full weld flash that will pass the *AWS D1.1 360°Visual Inspection Test*. If 7/8” studs are welded to vertical surfaces, the contractor should be prepared to repair the tops of the weld flash on studs that do not have the full 360°weld flash.

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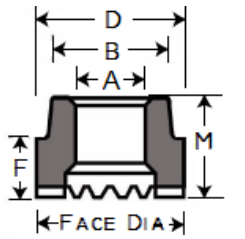
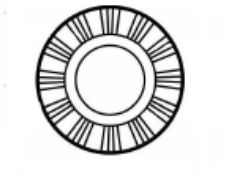
Nelson Ferrule Specification

Special Applications





Special Ferrules for Welding Through metal Deck

Stud shear connectors, pioneered by Nelson Stud Welding, have been recognized for many years as the most efficient means of achieving the necessary interaction between steel beams and concrete slabs in composite construction. Studs were soon followed by metal deck as another upgrading of the composite approach.

Nelson completed the cycle by developing the equipment and ceramic ferrules to reliably weld shear connector studs to beams, through metal deck, cellular decks, and single decks, with commercial grade (1-1/4 oz. per square foot) galvanized coatings.

Benefits of Basic Design Upgraded by Metal Deck

The recognized advantages of composite beam construction are augmented, in many cases, through the use of metal deck. The composite beam consists of three elements: the steel beam, a reinforced concrete slab, and shear connector studs welded to the beam. The studs transfer horizontal shear from slab to beam, causing the two elements to act as a single unit. The strength and stiffness of the effective section are increased without using more steel.

Composite design permits savings in steel tonnage of up to 20%. It reduces building height and saves on materials because lighter beams result in shallower floor sections and provides larger rooms with fewer obstructions because longer spans may be used. Although the advantages of metal deck may differ from job to job, the general benefits are so broad that deck can be recommended wholeheartedly. Here are some typical benefits:

- Metal deck provides a permanent form for concrete and eliminates the cost of wood forms and shoringcosts.
- Less reinforcing steel is needed.
- Construction is faster because deck serves as a work platform for alltrades.
- Electrical cables may be placed in cellular sections ofdeck.
- Suspended ceilings may cost less because it is simpler and faster to suspend them from metal deck than concrete.
- Metal deck stiffens the structure.
- A construction fire hazard is eliminated, usually resulting in more favorable insurancerates.

Stud Diameter A	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Face Diameter	Ferrule Part Number
3/8	0.785	0.875	0.281	0.438	0.875	100 101 242
1/2	1.030	1.150	0.438	0.625	0.920/0.86	100 101 237**
5/8	1.030	1.203	0.437	0.625	1.218	100 101 203
3/4	1.210	1.330	0.406	0.593	1.345	100 101 175*
3/4	1.210	1.304	0.406	0.593	1.060/1.00	100 101 177**

* Standard ferrule

** Chamfered for narrow valley decking - Chamfer less 0.030” radius both sides =Actual

The neck diameters of the ferrules are shown to assist in the selection of ferrule grips, ferrule holders, and foot plates.

For information on the studs that are used with this process, see Nelson H4L Concrete Anchor and S3L Shear Connector studs.

Note: Welding through metal deck is an application very dependent upon job site conditions and must be application qualified according to site conditions, metal deck thickness, amount of galvanizing on the deck, etc. Consult your Nelson Sales Representative for appropriate use of the ferrules shown and application details. Also consult guidelines and restrictions on through deck welding as shown in *AWS D1.1 Structural Welding Code – Steel and American Institute of Steel Construction Allowable Strength Design* and/or *Load &Resistance Factor Design* manuals of steel construction.

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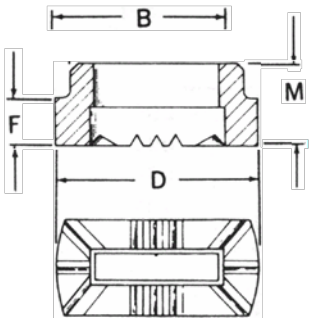
Nelson Ferrule Specification

Special Applications

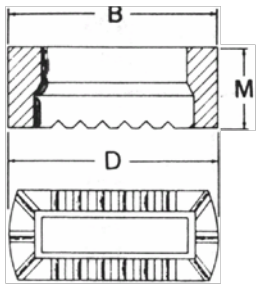
Rectangular Ferrules

The rectangular ferrules shown below are used to weld the following stud types: R1P and R1L Rectangular Studs without Holes, R2P Two Tine Rectangular Studs, R5P Strand Support Studs, R6P Rectangular Slotted Stud, R7P Rectangular Stud with Hole, RWP Stud, RXX FiberLok Stud, and other applications where rectangular studs are being applied to flat surfaces.

Standard Rectangular Ferrule



No Neck Rectangular Ferrule



Stud Thickness	Stud Width	Neck Diameter B	Width	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Grip or Foot	Ferrule Part Number
1/8	1/4	0.445	Round	0.578	0.234	0.390	501 003 006	100 301 014
1/8	3/8	0.505	Round	0.640	0.234	0.390	501 001 007	100 301 002
1/8	5/8	0.921	0.562	1.093	0.234	0.438	501 001 012*	100 301 003
1/8	5/8	0.921	0.320	1.093	0.234	0.375	501 001 012*	100 301 004
1/8	5/8	0.437	0.562	1.093	0.250	0.406	503 003 000	100 301 005
1/8	5/8	0.921	Round	1.020	0.205	0.375	501 001 012*	100 301 015
3/1	5/8	0.437	0.562	1.093	0.250	0.406	503 003 000	100 301 007
3/1	3/4	0.921	0.562	1.156	0.281	0.437	501 001 012*	100 301 006
1/4	5/8	0.500	0.625	1.093	0.250	0.406	503 003 000	100 301 021
1/4	1	1.210	0.625	1.406	0.281	0.437	501 001 015	100 301 010
1/4	1-1/4	1.812	0.750	1.812	no neck	0.672	503 001 000	100 301 012
3/8	1	1.610	0.750	1.610	no neck	0.437	503 022 000	100 301 023

* Ferrules with 0.921” neck may be welded with #501001012 ferrule grip, as shown, or depending on the stud shape, a ferrule foot plate #501006011, may be needed

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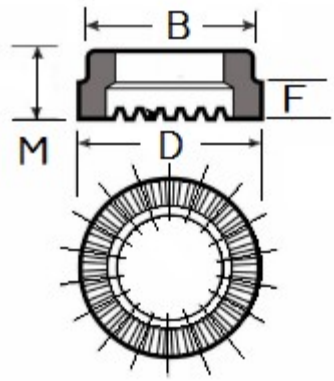
Nelson Ferrule Specification

Special Applications

Double Reduced Base Studs

These ferrules have an internal cavity, and are used to weld studs that have a base diameter that is significantly smaller than the outer diameter of the stud. This combination of stud and ferrule results in a weld flash diameter that is smaller than the stud diameter. Double reduced weld base studs may be used in applications where the base material thickness is too thin for welding the full stud diameter without burning through the base material.

The ferrules may also be used with short studs that serve as locator, or “dowel pin,” studs, where having a small weld flash is of more importance than the weld strength.



Stud Diameter (Outer)	Weld Base	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Ferrule Grip	Ferrule Part Number
3/4	7/16	0.990	0.990	No neck	0.406	501 010 019	100 107 002
5/8	7/16	1.000	1.000	No neck	0.406	501 010 117	100 108 008
3/4	1/2	1.100	1.100	No neck	0.500	501 010 118	100 108 019
5/8	7/16	1.100	1.250	0.156	0.406	501 010 053	100 108 020
5/8	7/16	0.921	1.030	0.218	0.406	501 001 012	-

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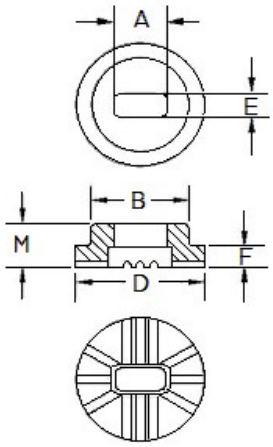
Nelson Ferrule Specification

Special Applications

Refractory Anchor Ferrules

S7X 3/16” “Steerhorn” and S4X “Y” Anchor refractory anchor studs have a special weld end shape. The weld ends of these studs are made by doubling the stud back on itself. These weld bases require a special ferrule to fit this weld base.

These ferrules are designed for welding of Nelson S4X and S7X style refractory anchor studs.



Stud Diameter	Neck Diameter B	Major Diameter D	Height to Neck F	Height Overall M	Inside Length A	Inside Width E	Ferrule Foot Plate	Ferrule Part Number
2 x 3/16” dia.	0.785	1.030	0.171	0.360	0.430	0.200	501 006 018	100 101 170
2 x 1/4" dia.	0.785	1.030	0.218	0.468	0.580	0.285	501 006 018	100 101 127

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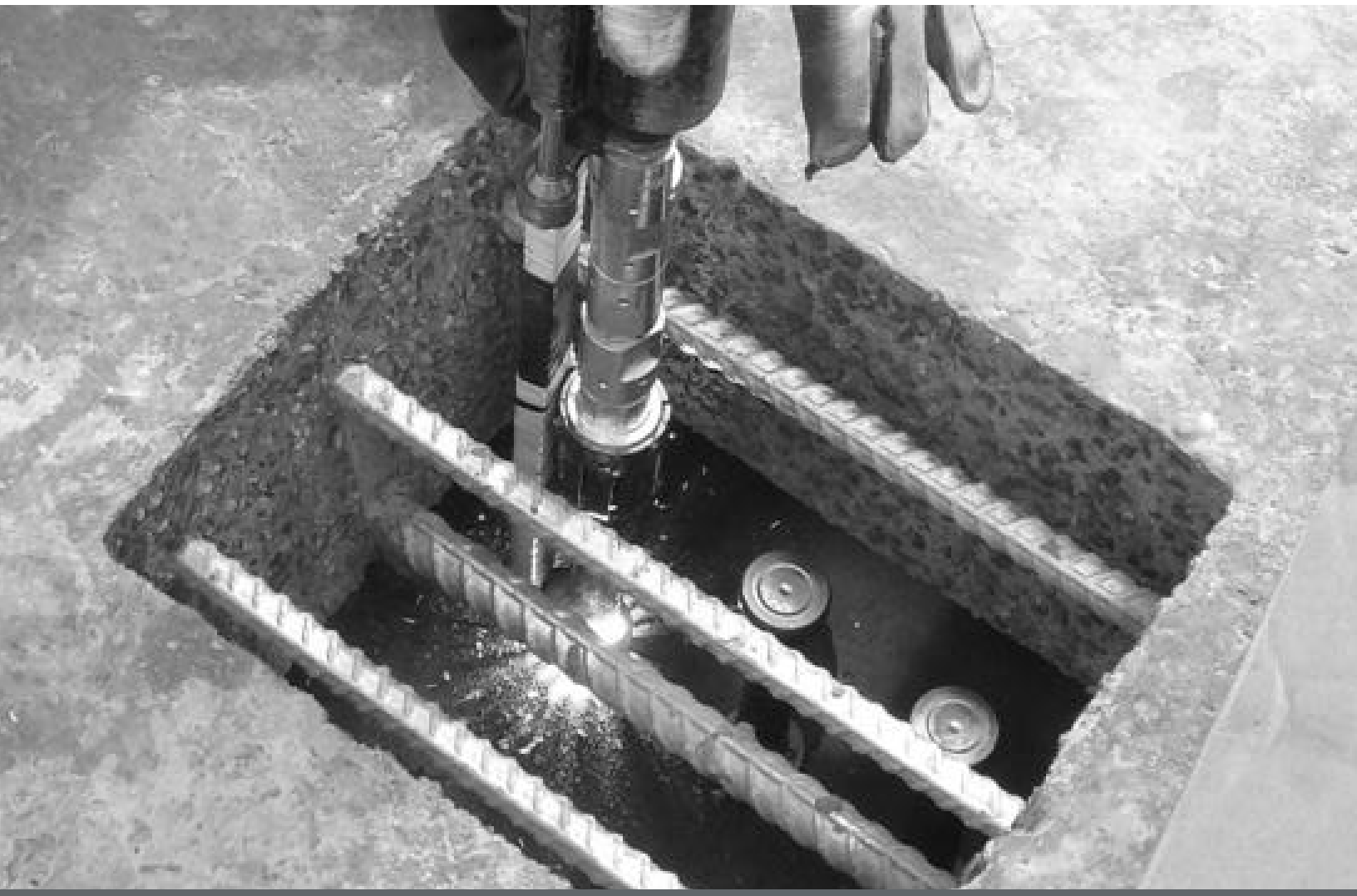
NELSON®

2020 Stud Welding Accessories



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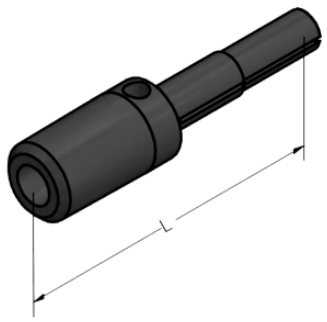
Nelson Accessory Specification

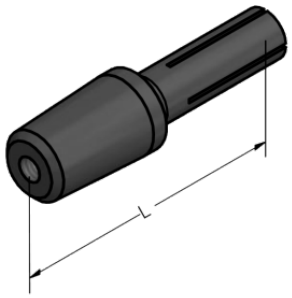
Standard Stud Weld Gun Chucks

Chuck Description	Stud Diameter		L	Chuck Part Number
	Imperial Dimension (inches)	Metric Dimension (mm)	Length (inches)	
#4	0.11	2.84	2-5/8	500 001 135
1/8” and 11 ga.	0.13	3.17		500 001 001
#6 and 10 ga.	0.13	3.40		500 001 002
5/32	0.16	3.96		500 001 003
#8 and 8 ga.	0.16	4.17		500 001 006
3/16” and #10	0.19	4.76		500 001 005
7/32 and 1/4-20 pitch	0.22	5.54		500 001 004



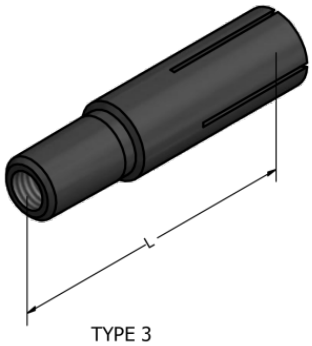
TYPE 1
#2 MORSE TAPER MOUNTING
STANDARD LENGTH ADJUSTABLE
DEPTH CHUCK

Chuck Description	Stud Diameter		L	Chuck Part Number
	Imperial Dimension (inches)	Metric Dimension (mm)	Length (inches)	
1/4	0.25	6.35	2 1/4	500 001 007
5/16-18 pitch	0.28	6.98		500 001 008
5/16	0.31	7.92		500 001 009
3/8-16 pitch	0.33	8.38		500 001 010
3/8	0.38	9.53		500 001 011
7/16	0.44	11.10		500 001 012
1/2-13 pitch	0.45	11.38		500 001 013



TYPE 2
#2 MORSE TAPER MOUNTING
STANDARD LENGTH ADJUSTABLE
DEPTH CHUCK

Chuck Description	Stud Diameter		L	Chuck Part Number
	Imperial Dimension (inches)	Metric Dimension (mm)	Length (inches)	
1/2	0.50	12.70	2 1/2	500 001 014
9/16 and 5/8-11 pitch	0.56	14.27	2 1/2	500 001 015
5/8	0.63	15.87	3	500 001 016
3/4-10 pitch and 11/16	0.68	17.27	3	500 001 245
3/4	0.75	19.05	3	500 001 018
7/8	0.88	22.23	3	500 001 019



TYPE 3
#2 MORSE TAPER MOUNTING
STANDARD LENGTH ADJUSTABLE
DEPTH CHUCK

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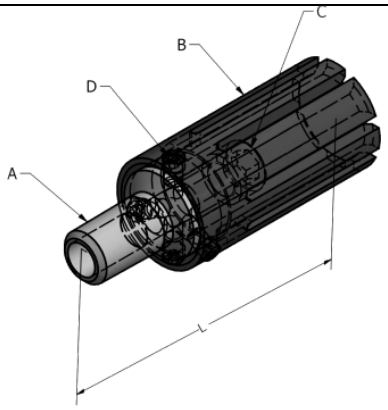
Nelson Accessory Specification

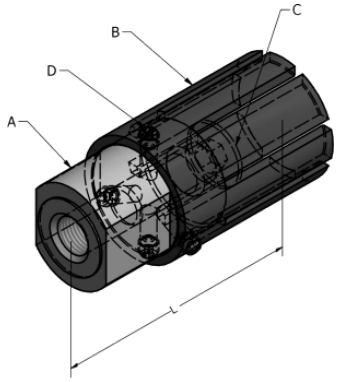
Standard Stud Weld Gun Chucks

Chuck Description	Stud Diameter		L	Chuck Part Number
	Imperial Dimension (inches)	Metric Dimension (mm)	Length (inches)	
1 Assembly	1.000	25.400	3 5/8	500 001 085
A 1 Body				500 001 110
B 1 Sleeve				500 000 111
1-1/8 Assembly	1.125	28.570	3 5/8	500 001 086
A 1-1/18 Body				500 001 113
B 1-1/8 Sleeve				500 001 114



TYPE 4
#2 MORSE TAPER MOUNTING
STANDARD LENGTH ADJUSTABLE
DEPTH CHUCK

Chuck Description	Stud Diameter		L	Chuck Part Number
	Imperial Dimension (inches)	Metric Dimension (mm)	Length (inches)	
1-1/4 Assembly	1.250	31.750	3 5/8	500 001 088
A 1-1/4 Body				500 001 117
A 1-1/4 Sleeve				500 001 118
1-3/8 Assembly	1.375	34.930	3 5/8	500 001 091
A 1-3/8 Body				500 001 121
A 1-3/8 Sleeve				500 001 120
1-1/2 Assembly	1.5	38.1	3 5/8	500 001 093
A 1-1/2 Body				500 001 123
A 1-1/2 Sleeve				500 001 124
1-5/8 Assembly	1.625	41.27	3 5/8	500 001 424
A 1-5/8 Body				500 001 425
A 1-5/8 Sleeve				500 001 426
1-3/4 Assembly	1.75	44.45	3 5/8	500 001 095
A 1-3/4 Body				500 001 115
A 1-3/4 Sleeve				500 001 116



TYPE 5
1/2-20 THREAD MOUNTING
STANDARD LENGTH ADJUSTABLE
DEPTH CHUCK

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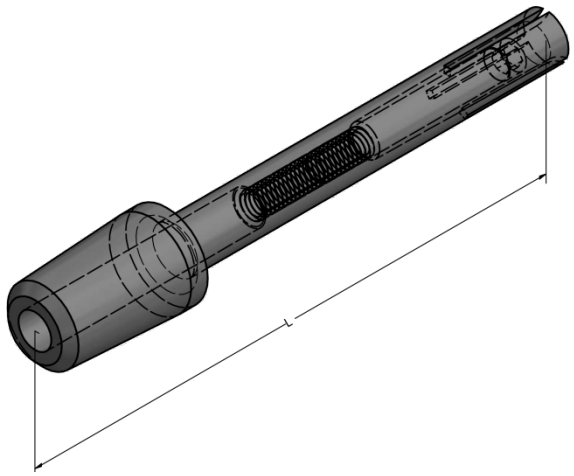
Nelson Accessory Specification

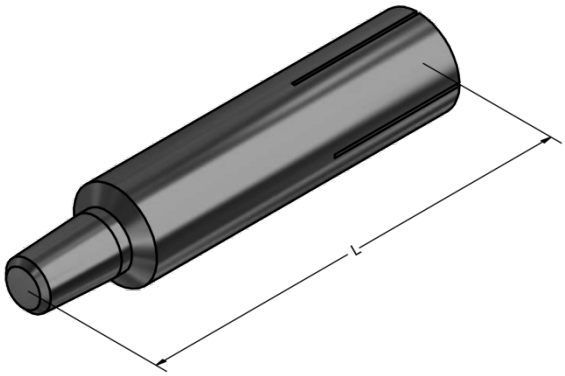
Long Style Chucks

Nelson long style chucks are typically used when more accessory length is needed. This occurs when short studs are welded through fixtures, templates, or through holes in materials like wood, plastic, or steel. Often, long style studs are used when ferrule tubing holds ferrules, during welding, in place of standard ferrule grips.

Chuck Description	Stud Diameter		L	Chuck Part Number
	Imperial Dimension (inches)	Metric Dimension (mm)	Length (inches)	
#8	0.164	4.17	3 7/8	500 001 221
#10	0.187	4.76		500 001 220
1/4	0.250	6.35		500 001 028
5/16	0.312	7.92		500 001 029
3/8	0.375	9.53		500 001 030
7/16	0.437	11.10		500 001 031
1/2	0.500	12.70		500001 032
M6	0.236	6.00		500 001 332
M10	0.394	10.00		500 001 334
M12	0.472	12.00		500 001 336



Chuck Description	Stud Diameter		L	Chuck Part Number
	Imperial Dimension (inches)	Metric Dimension (mm)	Length (inches)	
#6	0.138	3.51	4 3/4	500 001 036
#8	0.164	4.17		500 001 037
#10	0.190	4.83		500 001 038
1/4	0.250	6.35		500 001 039
5/16	0.312	7.92		500 001 040
3/8	0.375	9.53		500001 041
7/16	0.437	11.10		500 001 042
1/2	0.500	12.70		500 001 043
5/8	0.625	15.87		500 001 044
3/4	0.750	19.05		500 001 045
7/8	0.875	22.23		500 001 046



For 4 3/4" long straight style chucks the fixed chuck depth is 1/2”

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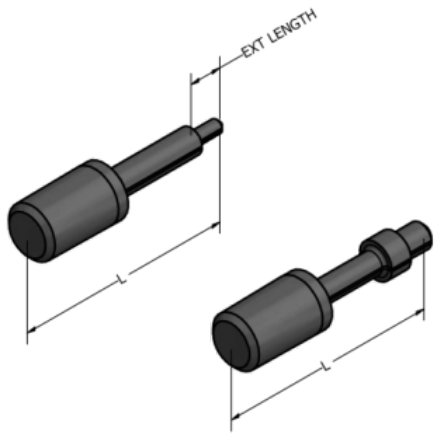
Nelson Accessory Specification

Male Style Chucks

Male Style 2 1/2" Long Chucks for Welding Internally Tapped Studs		
Chuck Description	**Length of Extension**	**Chuck Part Number**
#10-24	0.218	500 003 003
#10-24	0.375	500 003 004
#10-32	0.375	500 003 005
1/4-20	0.375	500 003 008
5/16-18	0.375	500 003 010
3/8-16	0.375	500 003 014
7/16-14	0.218	500 003 016
1/2-20	0.437	500 003 036
1/2-13	0.5	500 003 017
5/8-11	0.625	500 003 018
3/4-10	0.625	500 003 019



Male Style Chucks for Welding Stud with Unthreaded Holes		
Chuck Description	**Length of Extension**	**Chuck Part Number**
3/16	3/16	500 003 007
3/16	7/32	500 003 042
3/16	3/8	500 003 006
1/4	3/16	500 003 057
1/4	7/32	500 003 012
1/4	5/16	500 003 053
3/8	3/8	500 003 058

Chuck Adapter for Male Style Chucks		
Chuck Description	**Chuck Part Number**	
3/16” diameter hole	521 001 030	
1/4” diameter hole	521 001 014	
3/8” diameter hole	521 001 023	

#2 Morse Taper with Internal Hoe and Set Screw

Male Insert Style Chucks for Use with Chuck Adapters			
Chuck Description	**Length of Extension**	**Chuck Part Number**	**Chuck Part Number**
0.080	0.066	500 003 001	521 001 030
#8-32	1/8	500 003 002	521 001 014
1/8	1/4	500 003 028	521 001 014
3/16	3/8	500 003 021	521 001 014
1/4	No Shoulder	500 003 045	521 001 014

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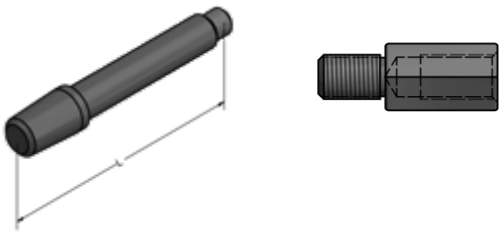
Nelson Accessory Specification

Chuck Extensions

Chuck Extensions			
Chuck Description	**Length of Threads**	**Extension Part Number**	
3/8-24 x 3.750 (2x Overall Length)	0.375	521 001 016	
1/2-20 x 1.500	0.750	521 001 004	

Chuck Extensions (Adds 1/2” to Length of Chuck Assembly)			
Chuck Description	**Length of Threads**	**Extension Part Number**	
3/4 Hex x _ _ _ _ (2x Overall Length)	0.750	521 001 005	 Threaded Tapered Adaptor (521 001 004) is required with the NS-20 Gun when using screw on type chucks with 1/2-20 threads.

1/2-20 External and Internal Thread with Lock Nut

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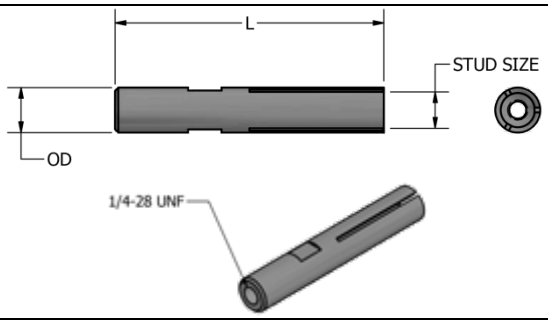
Nelson Accessory Specification

Screw-On Chucks and Extensions to Reach into Ferrule Tubing & Holes

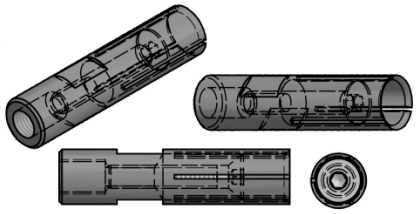
Chucks with 1/4-28 Internal Thread

Stud Size	Diameter (inches)	Length	Part Number
#8	0.164	3 5/8"	500 001 077
#10 & 3/16"	0.187	1 1/4"	500 001 142
1/4"	0.250	2 1/2"	500 001 079
5/16"	0.312	2 1/2"	500 001 080



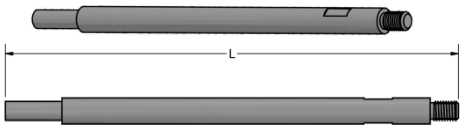
Chucks with 3/8-24 Internal Thread

Stud Size	Diameter (inches)	Length	Part Number
1/8”	0.125	2 1/2"	500 007 179
#6	0.132	2 1/2"	500 001 144
#8	0.164	2 1/2"	500 001 145
#10 & 3/16”	0.187	2 1/2"	500 001 146
1/4”	0.250	2 1/2"	500 001 147
5/16”	0.312	3 1/4"	500 001 190
3/8”	0.375	2 1/2"	500 001 131
1/2”	0.500	2 1/2"	500 001 083
5/8” & 3/4”	None Needed: The Chuck Stop Threads are 3/8-16 custom made with Taper Adaptor #521-001-023		



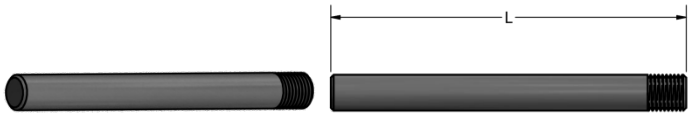
1/4" Bar with 1/4-28 Thread

Length	Part Number
6"	521 001 074



Bar with 3/8-24 Thread

Length	Part Number
3 3/4"	521 001 073
10"	521 001 089



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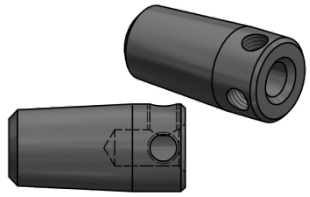
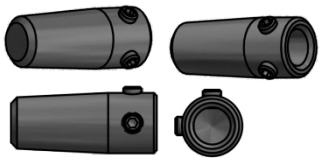
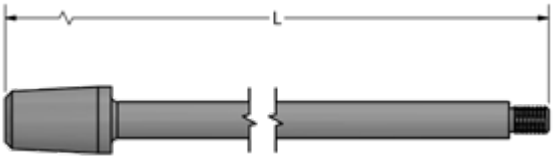
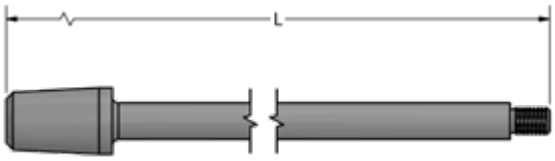
Nelson Accessory Specification

Screw-On Chucks and Extensions to Reach into Ferrule Tubing & Holes

Morse Taper with Hole for 1/4" Bar	
Part Number	
521 001 014	

Morse Taper with Hole for 3/8" Bar	
Part Number	
521 001 023	

Morse Taper with 1/4"-28 Thread		
Length	**Part Number**	
3 1/4"	521 001 040	
3 3/4"	521 001 021	
4 3/4"	521 001 063	
5 1/2"	521 001 051	
8"	521 001 049	

Morse Taper with 3/8"-24 Thread		
Length	**Part Number**	
1 3/8"	521 001 056	
3 1/2"	521 001 016	
10 3/16"	521 001 039	
21 1/2"	521 001 046	

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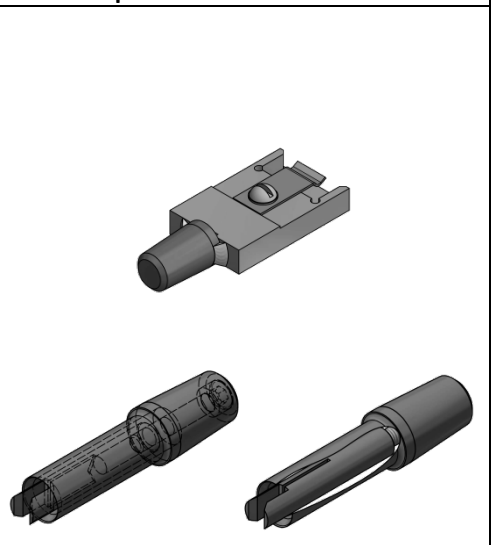
Nelson Accessory Specification

Rectangular, Square, Internal Chucks

Rectangular Chucks - Morse Taper Mount		
Chuck Description	**Chuck Part Number**	
1/8 x 1/4	500 005 118 (Fiber-Lok)	
1/8 x 3/8	500 005 003	
1/8 x 5/8	500 005 014	
1/8 x 3/4	500 005 021	
1/8 x 7/8	500 005 005	
1/8 x 1	500 005 006	
1/8 x 1-1/2	500 005 059	
3/16 x 3/4	500 005 007	
3/16 x 7/8	500 005 008	
3/16 x 1	500 005 009	
3/16 x 1-1/4	500 005 011	
1/4 x 1/2	500 005 092	
1/4 x 3/4	500 005 010	
1/4 x 1	500 005 012	
1/4 x 1-1/4	500 005 019	
3/8 x 1	500 005 101	

Internal Morse Taper Adapter with Internal Threads			
Thread	**Length**	**Part Number**	
1/2-20	1 7/8	751 004 029	

Morse Taper Mounting

Square Chucks		
Chuck Description	**Chuck Part Number**	
3/4	500 007 035	
7/8	500 007 037	
1 1/8	500 007 039	

1/2-20 Internal Thread Mounting

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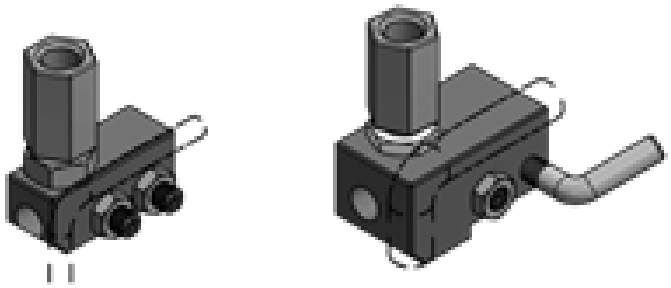
Nelson Accessory Specification

Bent and Side Gripping Chucks

90° Bent Style Stud Chucks	
Chuck Description	**Chuck Part Number**
1/8	500 008 001
1/8	500 008 002
3/16	500 008 004
1/4	500 008 005
5/16	500 008 006
3/8	500 008 007
7/16	500 008 009
1/2	500 008 010
9/16	500 008 011
5/8	500 008 012
3/4	500 008 013
7/8	500 008 014
1/4 x 1/2	500 005 092
1/4 x 3/4	500 005 010
1/4 x 1	500 005 012
1/4 x 1-1/4	500 005 019
3/8 x 1	500 005 101



1/2-20 Internal Thread Mounting

45° Bent Style Stud Chucks	
Chuck Description	**Chuck Part Number**
3/8	500 010 002
1/2	500 010 008
5/8	500 010 010
3/4	500 010 016
7/8	500 010 037

Morse Taper Mounting

Side Gripping Chuck Assemblies	
Chuck Description	**Chuck Part Number**
1/4	500 014 103
3/8	500 014 102
1/2	500 014 095
5/8	500 014 096
3/4	500 014 097
7/8	500 014 101

Chuck Adaptor Offset, 500 014 088 and other parts are needed to mount these to chucks to stud welding gun.
Nelson side grip chucks have two ball detents and a screw lever to grip studs.
Alternate side gripping chuck designs are available.

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Nelson Accessory Specification

Ferrule Grips and Feet

Standard feet are made of an insulating material. They are mounted on the two legs that extend from the gun body. A ferrule grip, ferrule holder, or spark shield is then installed on the foot.

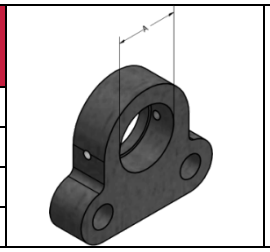
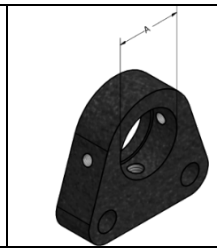
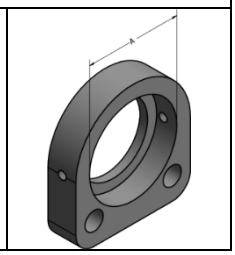
The foot is adjusted and locked so that a portion of the stud extends beyond the ferrule or spark shield. This portion of the stud is available to be melted during the welding process to create the weld flash surrounding the welded stud. The foot and leg assembly is locked into position by set screws in the gun body that tighten against the legs. When the gun is positioned to make a weld, the spark shield or ferrule contacts the base material and provides a reference for the lift and plunge of the stud during the weld cycle.

Ferrule Sizing Chart - Ferrule Grip and Feet

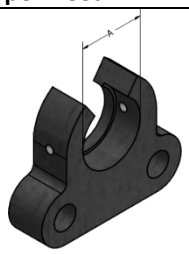
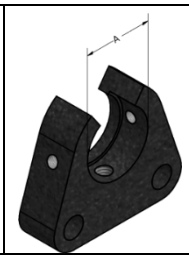
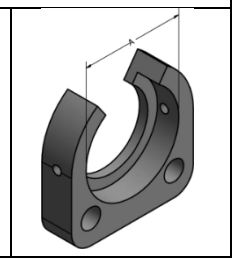
Foot Size	Nominal Ferrrule Size		Ferrule Neck Diameter	
	Minimum	Maximum	Minimum	Maximum
Small	1/8	1/2	0.281	0.650
Medium	5/8	3/4	0.785	1.030
Large	7/8	1	1.210	1.406

Different feet may be needed for various stud welding applications. Please consult the charts below for different feet styles

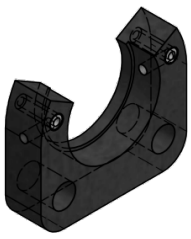
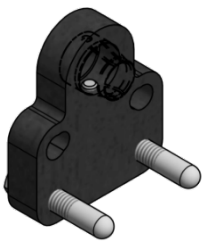
Standard Closed Feet

Gun Description	Small A=0.875	Medium A=1.156	Large A=1.750			
NS-20	502 001 001	502 001 002	502 001 003			
NS-20A-HD	502 001 001	502 001 002	502 001 003			
NS-30	502 001 137	502 001 138	502 001 144			
NS-40	502 001 137	502 001 138	502 001 144			

Standard Split or Open Feet

Gun Description	Small A=0.875	Medium A=1.156	Large A=1.750			
NS-20	502 002 001	502 002 002	N/A			
NS-20A-HD	502 002 001	502 002 002	502 002 003			
NS-30	502 002 045	502 002 046	N/A			
NS-40	502 002 045	502 002 046	N/A			

Shear Connector and Gas Feet

Gun Description	Small A=0.875	Medium A=1.156	Large A=1.750			
NS-20	N/A	N/A	751 020 000			
NS-20A-HD	502 002 009	503 000 000	N/A			
NS-30	N/A	503 019 000	751 020 000			
NS-40	N/A	503 019 000	751 020 000			

1. Use with Shear Connector Ferrule Grips
2. NS-30 and NS-40: for ferrules 3/8” diameter and smaller. NS-20A-HD: for ferrules 1/2" diameter and larger.
3. For studs 3/16” through 1/2"

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Nelson Accessory Specification

Ferrule Grips and Feet

Ceramic ferrules, an essential part of the stud welding process, can be positioned on the front of the stud welding gun using several different styles of ferrule grips or ferrule holders.

Standard ferrule grips are used for most studs. Split ferrule grips are used for long studs, and for studs that have heads larger than the stud base diameter. Shear Connector grips and the Weld Through Metal Deck ferrule holders are used in construction applications. Ferrule tubes are used for welding through holes in wood, plastic, or masonry.

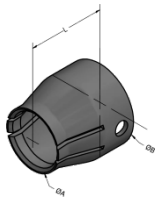
The neck diameter of the ferrule is the primary dimension needed when selecting the appropriate ferrule grip or ferrule holder. Below is a chart showing the various ferrule grips, ferrule holders, and ferrule tubing needed for ferrules with different neck diameters.

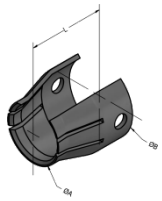
Small Copper Ferrule Grips (Fits Standard "Small" Feet, Major Diameter: 0.875")								
Ferrule Neck Diameter	**Nominal Size**	**Standard Ferrule Grip**	**Standard Split Ferrule Grip**	**Long Length Split Ferrule Grip**	**Ferrule Foot Plate**	**Shear Connector Grip [1]**	**Weld Through Deck Ferrule Holder [2]**	**Ferrule Tubing**
0.281	#6	501 001 002	501 003 001	N/A	N/A	N/A	N/A	N/A
0.291	#8	501 001 003	501 003 002	N/A	N/A	N/A	N/A	501 005 001
0.305	#10	501 001 004	501 003 003	N/A	501 006 010	N/A	N/A	501 005 002
0.380	1/4*	501 001 005	501 003 005	501 004 003	501 006 001	N/A	N/A	501 005 003
0.445	5/16	501 001 006	501 003 006	501 004 005	501 006 002	N/A	N/A	501 005 004
0.505	3/8*	501 001 007	501 003 007	501 004 006	501 006 003	N/A	501 006 050	501 005 005
0.585	7/16	501 001 008	501 003 008	501 004 007	501 006 004	N/A	N/A	501 005 006
0.650	1/2*	501 001 009	501 003 009	501 004 008	501 006 005	501 003 022	501 006 039	501 005 007

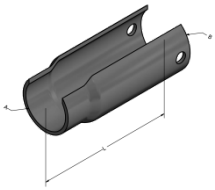
1 Shear Connector ferrule grips are for use in Standard Shear Connector foot #502002009; Shear Connector Bipod Foot #503000000, or Standard Large Feet, #502001144, for NS-30 and NS-40 guns, or #502001003 for NS-20 and Heavy Duty guns.

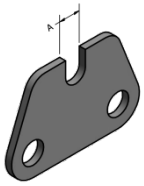
2 Weld Through Deck ferrule Holders are for use on WTD Foot extension Assembly, #502002042.

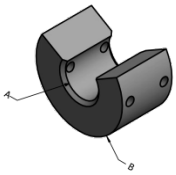
NOTE: The ferrules supplied for unthreaded 1/4", 3/8", 1/2", and 5/8" diameter studs have neck diameters that are for 1/8" larger ferrules than the standard. This applies to NBL, H4L, HBL, SBL, and D2L studs.

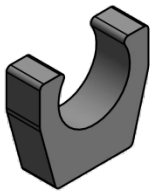

Standard Ferrule Grip

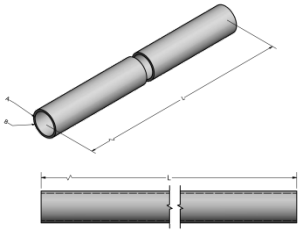

Split Ferrule Grip


Long Length Ferrule Grip


Ferrule Foot Plate- Brass


Shear Connector Ferrule Grip


Weld Through Deck Ferrule Holder - Brass


Ferrule Tubing - Fiberglass

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Nelson Accessory Specification

Ferrule Grips and Ferrule Holders

NOTE: The ferrules supplied for unthreaded 1/4", 3/8", 1/2", and 5/8" diameter studs have neck diameters that are for 1/8 larger ferrules than the standard. This applies to NBL, H4L, HBL, SBL, and D2L studs.

Medium Copper Ferrule Grips (Fits Standard "Medium" Feet, Major Diameter: 1.156"								
Ferrule Neck Diameter	Nominal Size	Standard Ferrule Grip	Standard Split Ferrule Grip	Long Length Split Ferrule Grip	Ferrule Foot Plate	Shear Connector Grip [1]	Weld Through Deck Ferrule Holder [2]	Ferrule Tubing
0.785	5/8	501 001 011	501 003 010	501 004 009	501 006 007	501 003 021	501 006 044	501 005 008
0.921	3/4 Special	501 001 012	501 003 011	N/A	501 006 011	N/A	N/A	N/A
1.030	3/4	501 001 014	501 003 014	501 004 014	501 006 008	501 003 019	501 006 027	501 005009

1 Shear Connector ferrule grips are for use in Standard Shear Connector foot #502 002 009; Shear Connector Bipod Foot #503 000 000, or Standard Large Feet, #502 001 144, for NS-30 and NS-40 guns, or #502 001 003 for NS-20 and Heavy Duty guns.
2 Weld Through Deck ferrule Holders are for use on WTD Foot extension Assembly, #502 002 042.

Large Copper Ferrule Grips (Fits Standard "Large" Feet, Major Diameter: 1.750"								
Ferrule Neck Diameter	Nominal Size	Standard Ferrule Grip	Standard Split Ferrule Grip	Long Length Split Ferrule Grip	Ferrule Foot Plate	Shear Connector Grip [1]	Weld Through Deck Ferrule Holder [2]	Ferrule Tubing
1.210	7/8	501 001 015	501 003015	N/A	501 006 009	501 003 020	501 006 028	N/A
1.406	1	501 001 016	501 003 016	N/A	501 006 032	501 003 025	501 006 046	N/A

1 Shear Connector ferrule grips are for use in Standard Shear Connector foot #502 002 009; Shear Connector Bipod Foot #503 000 000, or Standard Large Feet, #502 001 144, for NS-30 and NS-40 guns, or #502 001 003 for NS-20 and Heavy Duty guns.
2 Weld Through Deck ferrule Holders are for use on WTD Foot extension Assembly, #502 002 042.

Ferrule Tube Bushings *					
Neck Diameter of Ferrule	Nominal Size	Ferrule Tube Bushing	Outside Diameter	Fits into ____ Foot	Ferrule Tubing
0.291	#8	506 000 001	0.875	Small	501 005 001
0.305	#10	506 000 002	0.875	Small	501 005 002
0.380	1/4	506 000 003	0.875	Small	501 005 003
0.445	5/16	506 000 004	0.875	Small	501 005 004
0.505	3/8	506 000 005	0.875	Small	501 005 005
0.585	7/16	506 000 006	0.875	Small	501 005 006
0.650	1/2	506 000 007	0.875	Small	501 005 007
0.785	5/8	506 000 008	1.156	Medium	501 005 008
0.921	3/4 Special	506 000 009	1.156	Medium	501 005 011
1.030	3/4	506 000 017	1.750	Large	501 005 009

* Available in 32" and 36" Lengths

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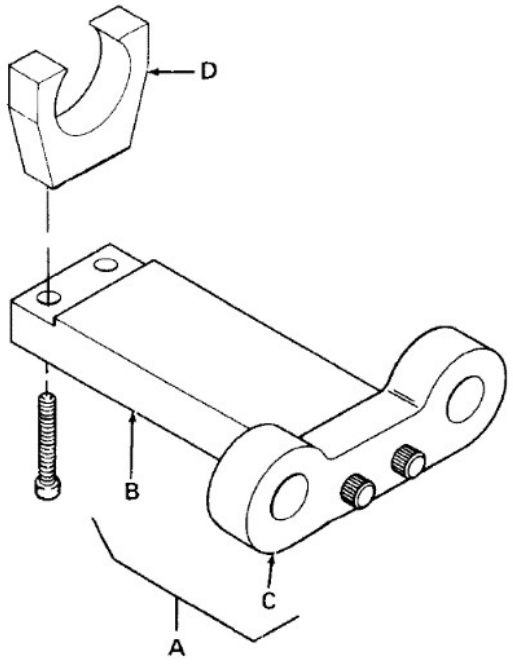
Nelson Accessory Specification

Welding Through Metal Decking

Weld Through Deck Accessories	
Part Description	**Diagram**
Foot Extension Assembly	A
Foot Extension	B
Foot	C
Ferrule Holder	D



Weld Through Deck Accessories		
Part Description	**Inside Diameter**	**Part Number**
Foot Extension Assembly	-	502 002 042
Foot	-	502 002 043
3” Bar Extension	-	502 002 044
5.5” Bar Extension	-	502 002 065
8” Bar Extension	-	502 002 055
10” Bar Extension	-	502 002 052
16” Bar Extension	-	502 002 053
22” Bar Extension	-	502 002 054
28” Bar Extension	-	502 002 056
34” Bar Extension	-	502 002 057
46” Bar Extension	-	502 002 058
Ferrule Holder (1/4 - 3/8”)	0.505	501 006 050
Ferrule Holder (3/8 - 1/2”)	0.650	501 006 039
Ferrule Holder (1/2 - 5/8”)	0.785	501 006 044
Ferrule Holder (5/8 - 3/4”)	1.030	501 006 027
Ferrule Holder (3/4 - 7/8”)	1.210	501 006 028
Ferrule Holder (7/8 - 1”)	1.406	501 006 046
WTD Bi-Pod Kit *		503 032 003

* See Bipod Feet for Perpendicularity for more information

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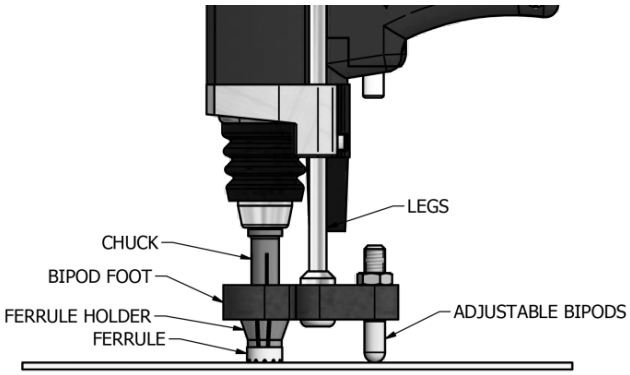
Nelson Accessory Specification

Miscellaneous Accessories

Bipod Feet for Perpendicularity

The bipod feet have two tapped holes with threaded pins using locking nuts. The adjustable pins are located back from the legs. The height of the two pins needs to be adjusted so that they are at the same elevation as the face of the ceramic ferrule when it is in the ferrule grip. The ferrule and the properly adjusted pins will provide three points of reference on the surface of the base material. This three-point contact will enable the welders to maintain precise stud perpendicularity to the base material.

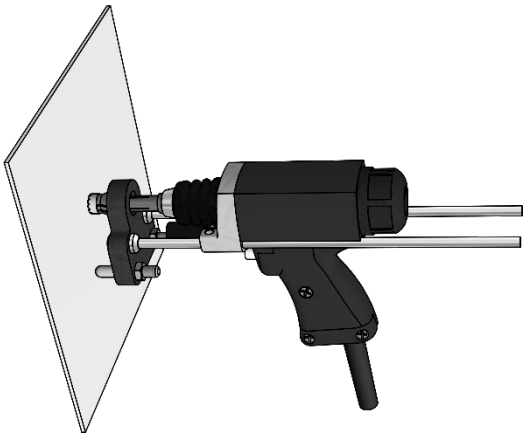


Gun Description	Small Closed ≤0.875”	Medium Closed 0.785-1.156”	Large Split 1.750
NS-40 / NS-	503 019	503 057 000	N/A
NS-20HD	503 019	503 057 000	503 000 000

Large Split Bipod Foot

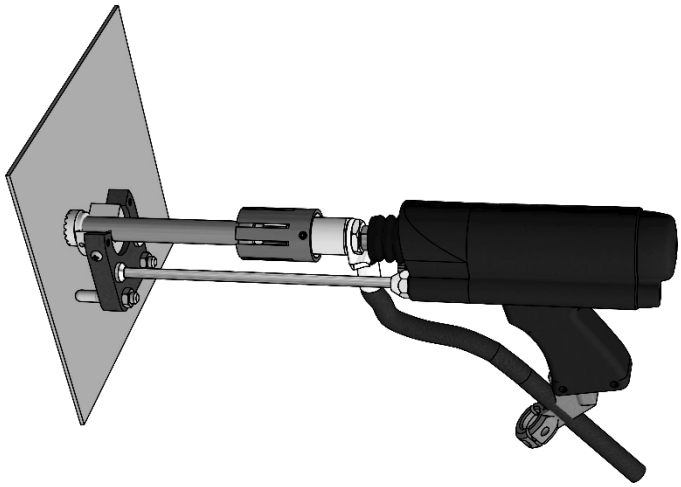
Shear Connector Ferrule Grips

Neck Diameter	Ferrule Holder	Split Grip
0.650”	501 003 022	N/A
0.785”	501 003 021	N/A
1.030”	501 003 019	501 002 014
1.210”	501 003 020	501 003 015
1.460”	501 003 025	501 003 016



WTD Bipod Kit

NS-20HD	512 032 003
WTD Ferrule Holders	
0.505”	501 006 050
0.650”	501 006 039
0.785”	501 006 044
1.030”	501 006 027
1.210”	501 006 028
1.406”	501 006 046



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Nelson Accessory Specification

Miscellaneous Accessories

S4X and S7X Refractory Anchor Accessories

Part Description	Part Number
Chuck	500 015 073
Ferrule Foot Plate	501 006 018

Pipe Hanger Assemblies (Clip Stud 101084029)

Part Description	Part Number
Chuck	500 005 061
Foot-Grip Assembly	503 022 000

Ferrule Foot Plates

Stud Diameter	Grid Opening A	Part Number
1/4	0.380	501 006 001
5/16	0.445	501 006 002
3/8	0.505	501 006 003
7/16	0.585	501 006 004
1/2	0.650	501 006 005
5/8	0.785	501 006 006
3/4	1.030	501 006 007
7/8	1.210	501 006 008

Shear Connector Ferrule Grips

Stud Diameter	Inside Dia. A	Outside Dia. B	Part Number
1/2	0.650	1.750	501 003 022
5/8	0.785	1.750	501 003 021
3/4	1.030	1.750	501 003 019
7/8	1.210	1.750	501 003 020
1	1.406	1.750	501 003 023

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Nelson Accessory Specification

Miscellaneous Accessories

NS-20 or NS-20A HD legs – 3/8” Leg Diameter			
Part Description	**Stud Length**	**Stud Length for Gun with Tranquil Arc**	**Part Number**
Adjustable 9” leg	Less than 4-1/2”	-	504 000 002
Adjustable 14” leg	4-1/2 thru 9-1/2”	Less than 4-1/2”	504 000 003
Adjustable 18” leg	9 thru 14”	4-1/2 thru 8-1/2”	504 000 004
Adjustable 23” leg	13-1/2 thru 18-1/2”	8-1/2 thru 13-1/2”	504 000 005
Adjustable 27” leg	18 thru 23”	13-1/2 thru 17-1/2”	504 000 006
Adjustable 32” leg	22-1/2 thru 27-1/2”	17-1/2 thru 22-1/2”	504 000 007

NS-30 or NS-40 Legs – 5/16” Leg Diameter		
Part Description	**Stud Length**	**Part Number**
Adjustable 7” leg	Less than 4-1/2”	504 000 037
Adjustable 12” leg	4-1/2 thru 9-1/2”	504 000 038
Adjustable 17” leg	9 thru 14”	504 000 039
Adjustable 22” leg	14-1/2 thru 19-1/2”	504 000 040

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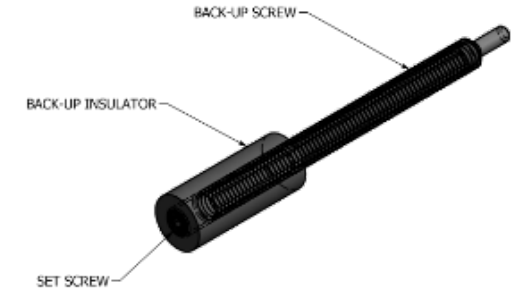
Nelson Accessory Specification

Capacitor Discharge Accessories

CD Weld Gun Chucks

Note: NCD and CD Lite chucks are NOT interchangeable due to the difference in the 3/8" and 10mm outside diameter of these chucks

Capacitor Discharge Stud Welding Chucks (NCD and NCD+ Welding Guns)				
Chuck Description 3/8" O.D.	Stud Diameter		L	Chuck Part Number
	Imperial (inches)	Metric (mm)	Length (inches)	
13ga.	0.095	2.41	2-3/8	500 001 374
12ga.	0.109	2.77		500 001 363
M3, 0.118, #4 threaded	0.112	2.84		500 001 355
1/8, #5 threaded	0.125	3.17		500 001 390
10ga., #6 threaded	0.134	3.40		500 001 356
M4	0.157	3.99		500 001 361
#8 threaded	0.164	4.17		500 001 357
3/16 Annular Ring	0.178	4.75		500 001 373
3/16", #10 threaded	0.190	4.83		500 001 366
M5	0.197	5.00		500 001 358
M6	0.236	6.00		500 001 362
1/4	0.250	6.35		500 001 359
M7	0.275	7.00		500 001 368
5/16, M8	0.312	7.92		500 001 360
3/8	0.375	9.53		500 001 369
M10	0.394	10.00		500 001 369

Stud Stop Pin Assembly for NCD and NCD+		
Stud Length (inches)	Part Number	
1/4 to 5/8	500 017 017	
3/4 to 1-1/8	500 017 018	
1-1/4 to 1-5/8	500 017 019	
1-3/4 to 2-1/8	500 017 020	
Pencil Gun	500 017 063	

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Nelson Accessory Specification

Capacitor Discharge Accessories

CD Weld Gun Chucks

Note: NCD and CD Lite chucks are NOT interchangeable due to the difference in the 3/8" and 10mm outside diameter of these chucks

Capacitor Discharge Stud Welding Chucks (CD Lite-G and CD Lite-C)*					
Chuck Description 3/8" O.D.	Stud Diameter		L	Chuck Part Number	
	Imperial Dimension (inches)	Metric Dimension (mm)	Length (inches)		
#4, 12 ga, M3	0.112	2.84	1 3/4	500 001 515	
#6 & 10 ga	0.134	3.40		500 001 516	
M4	0.157	4.00		500 001 511	
#8	0.164	4.17		500 001 517	
M5	0.198	5.00		500 001 512	
#10 & 3/16	0.190	4.83		500 001 518	
M6	0.236	6.00		500 001 513	
1/4	0.250	6.35		500 001 519	
5/16 & M8	0.312	7.92		500 001 520	

* For welding 1/4" to 1 1/2" (3 to 40mm) long studs.

Welding studs longer than 1 1/2" or welding through a template requires special accessories.

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Nelson Accessory Specification

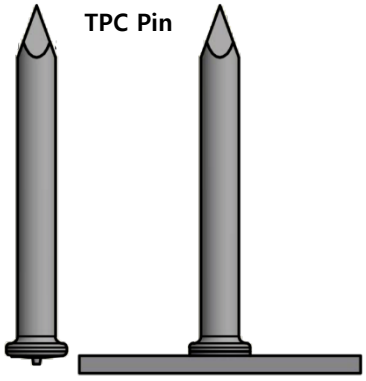
Capacitor Discharge Accessories

Accessories for Welding Insulation Pins

Accessories for Welding 12 ga. TPC Insulation Pins

Part Description	Stud Length	Part Number
Chuck	3/4" (1/2" deep)	500 001 169
Chuck	Larger than 1" (3/4"	500 001 153
Morse Taper	--	521 001 014
Spark Shield	Less than 3-1/2" long	511 001 002
Spark Shield	3-1/2" long and over	511 001 004

TPC Pin

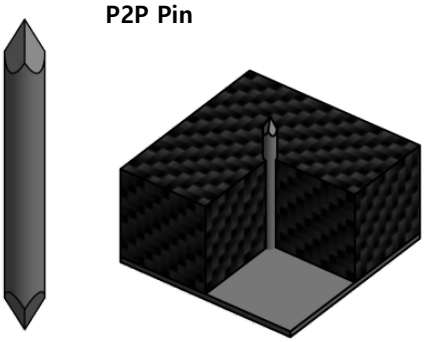


Accessories for Welding 10 ga. TPC Insulation Pins

Part Description	Stud Length	Part Number
Chuck	Larger than 1" (3/4"	500 001 149
Morse Taper	--	521 001 014
Spark Shield*	Less than 3-1/2" long	511 001 002
Spark Shield*	3-1/2" long and over	511 001 004

* Use foot #502001002 for NS-20 gun and #502001138 for NS-30 and NS-40 guns.

P2P Pin



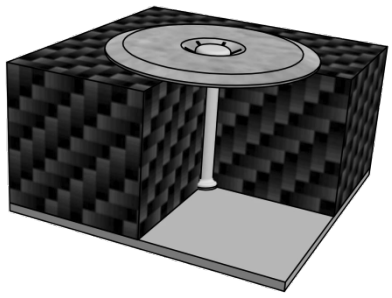
Accessories for Welding 10 ga. P2P Insulation Pins

Part Description	Stud Length	Part Number
Chuck	Larger than 1" (3/4"	500 001 149
Morse Taper	--	521 001 014
Ferrule Grip	--	501 001 003

Accessories for Welding 10 ga. or 12 ga. CHP Insulation Pins

Part Description	Stud Length	Part Number
Chuck – Magnetic Type	10 or 12 ga.	500 015 093
Chuck – Grip Type	12 ga., 1-3/-16" diameter	500 015 094
Chuck – Grip Type	10 ga., 1-1/2" diameter	500 015 095
Morse Taper Adapter	--	521 001 023
Foot – Standard; NS-20*	--	503 011 030
Foot – Swivel; NS-20, NS-30, and	--	503 011 040
Foot – Standard; NS-30 and NS-40*	--	503 011 050

CHP Pin



* Supplied with stop screws for welding pins up to 1-1/2" long.
Optional stop screw, #503011033, for pins 1-1/2—4" long is available.

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Nelson Accessory Specification

Stored Arc Accessories

Standard Length Straight-Style Chucks

Stud Diameter	Part Number
1/8” and 11 ga.	501 001 001
#6 threaded and 10 ga.	501 001 002
#8 threaded and 8 ga.	501 001 006
#10 threaded and 3/16”	501 001 005
1/4”	501 001 007

Gun Description	Standard Feet	Spark Shield
NSA-80A	502 001 137	511 001 108
NSA-80	502 001 002	511 001 002

Standard Gas Adapter Feet

(For welding Aluminum studs)

Stud Diameter	Part Number
Standard Gas Adapter Foot* (Includes NSA-80A Gas Spark Shield)	751 022 000
NSA-80A Gas Spark Shield	511 002 001

* Long style chuck required for studs under 3/4” long.

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