

COMPLETE STUD WELDING

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*See Threaded & No Thread Technical Details

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Currently Under Construction - call for assistance

Threaded Studs

Externally Threaded

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Threaded Partially	TP
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SECTION 1

STUD ARC WELDING — INTRODUCTION

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Stud ARC Welding: Introduction

COMPANY PROFILE

Complete Stud Welding is engaged in the sales, rental, and support of stud welding products.

Our products include a full line of weld studs, standard and custom accessories, and a comprehensive line of stud welding equipment for rent and purchase.

We support our customers' by; providing and answering technical questions; providing in shop process support, training and troubleshooting; supplying equipment parts; and performing equipment repairs.

We take a long term approach to earning every customer's business and developing a mutually successful relationship. We believe that quality, delivery, price, support and service are paramount to earning every customer's business. We strive to provide the responsive, courteous, and accurate personalized service you deserve.

If you are looking to purchase stud welding equipment, we have the application expertise and equipment knowledge to recommend and explain the equipment options for your application(s). We believe this leads to the customer making an informed decision that is the best for their business at that point in time.

We appreciate the opportunity to work for you and appreciate every order we receive.

Feel free to contact us at any time on any day.

Thank you for your time and interest in **Complete Stud Welding, Inc.**

Stud ARC Welding: Introduction

INTRODUCTION

Stud Welding - General

Stud Welding is a general term for joining a metal stud or similar part to a work piece. Welding can be done by a number of welding processes including ARC, Resistance, Friction and Percussion.

Of these processes, STUD ARC WELDING utilizes equipment and techniques unique to stud welding. The other processes use conventionally designed equipment with special tooling for stud welding.

The process technically known as STUD ARC WELDING is generally known as "STUD WELDING." STUD ARC WELDING methods, processes, equipment, weld studs, accessories and related products are covered in this product literature"

Stud Arc Welding

Stud Arc Welding is an arc welding process in which a stud or similar metal part can be end-joined to a work piece instantaneously. This process involves the same basic principles and metallurgical aspects as any other arc welding procedure.

Process Overview - The stud is placed (with a hand tool, weld gun or weld head) against the base metal, through the control of the stud welding equipment and the design of the stud; an arc is drawn which melts the base of the stud and a proportionate area of the base metal, the stud is then forced into the molten pool and held in place until the metals re-solidify. This high quality fusion weld is completed in milliseconds.

Stud ARC Welding Methods - The two stud welding methods are called ARC and Capacitor Discharge (usually "CD" for brevity). The difference between these two methods involves the Power Source used to provide the welding current / energy and the stud design.

The equipment required to STUD ARC WELD is composed of a direct current power supply, a weld gun or weld head and the weld cables.

Advantages

The Major advantages of STUD ARC WELDING are:

- **Cost savings** — reduced labor time, materials and secondary operations.
- **Weld strength** — weld is typically stronger than the stud and base material.
- **Process** — single sided and split second cycle time
- **Base metal** — minimal heating and warpage
- **Base metal** — attachment to very thin metals
- **Base metal** — no reverse side marking (CD Method)

Stud ARC Welding: Introduction

STUD ARC WELDING – CHARACTERISTICS OF EACH METHOD

General Characteristics Of Each Method		
Characteristic	CD Stud Welding	ARC Stud Welding
Source of Weld Power:	Rapid discharge of stored energy from bank of capacitors	Transformer-Rectifier
		Inverter
		Motor/Engine-Generator
		Storage Battery
Power Source Input Voltages:	110 Volt AC, Single Phase	230 Volt AC, Three Phase *
	220 Volt AC, Single Phase	380 Volt AC, Three Phase
		400 Volt AC, Three Phase
		460 Volt AC, Three Phase *
		575 Volt AC, Three Phase
		* Limited single phase based power sources
Typical Weld Tools:	Hand Held Weld Gun **	
	Mounted Weld Head **	
** Auto feed options are available for both weld tools		
Typical Stud Diameters:	.080 - .312"	.138 - 1.0"
Maximum Diameter:	.460"	2.0"
Shielding:	Shielding is not typically needed	Shielding is typically needed in the form of ceramic ferrule (most common) or gas
Welding Position:	Down Hand	
	Side Hand (limited to 7/8" diameter)	
	Over Head (limited to 7/8" diameter)	
Specific Process for each Method:	Contact	ARC or Drawn ARC
	Gap	Short Cycle (with or w/o gas)
	Drawn ARC	

Stud ARC Welding: Introduction

PROCESS SELECTION GUIDE

Factors To Be Considered	CD Processes		ARC Processes	
	Contact /Gap	Drawn ARC	Std. ARC	Short Cycle
Stud Shape:				
Round	A	A	A	A
Square	A	A	A	A
Rectangular	A	A	A	A
Other	A	A	A	A
Stud Weld Base Diameter:				
.060 - .125" Dia.	A	A	N	L
.125 - .250" Dia.	A	A	L	A
.250 - .430" Dia.	A	A	A	A
.430 - 1.00" Dia.	N	N	A	L
1.00 - 2.00" Dia.	N	N	B	N
Up to 0.05 inch squared	A	A	L	A
Over 0.05 inch squared	N	N	A	L
Stud Material:				
Carbon Steel	A	A	A	A
Stainless Steel	A	A	A	A
Alloy Steel	L	L	A / B	A / B
Aluminum	A	B	B	L
Brass	A	A	L	L
Base Material:				
Carbon Steel	A	A	A	A
Stainless Steel	A	A	A	A
Alloy Steel	A	L	A / B	A / B
Aluminum	A	B	B	L
Brass	A	A	L	L
Base Metal Thickness:				
Under .015"	A	B	N	N
.016 - .030"	A	A	L	B
.031 - .062"	A	A	L	A
.063 - .125"	A	A	B	A
Over .126"	A	A	A	A
Shielding:				
Ceramic Ferrule	N	N	A	N
Gas	L	L	L	A
Stud Type / Design:				
ARC	N	N	A	L
CD (Capacitor Discharge)	A	A	L	A
SC (Short Cycle)	N	N	B	A
Design Criteria:				
Heat Effect on Material(s)	A	A	B	B
Weld Flash Clearance	A	A	B	B
Reverse Side Marking	A	A	N	L
Strength of Stud Rules	A	A	A	A
Strength Base Metal Rules	A	A	A	A
Legend:				
A - Applicable without special procedures, equipment, etc.				
B - Applicable with special techniques or on special applications.				
L - Limited application				
N - Not recommended				

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Stud ARC Welding: Introduction

PROCESS & STUD TYPE COMBINATION GUIDE

Stud Type / Style	CD Processes		ARC Processes	
	Contact /Gap	Drawn ARC	Std. Arc	Short Cycle
ARC Weld Studs:				
Concrete Anchors	N	N	A	N
Threaded	N	N	A	C
No Thread	N	N	A	C
Tuffstuds	N	N	A	N
Debarking	N	N	A	N
Rectangular	N	N	A	C
Refractory *	N	N	A	C
* Some Refractory Anchors are suitable for hand welding only				
CD Weld Studs:				
All CD Styles	A	A	C	A **
** For smaller weld base diameters, results may not be acceptable for application requirements				
Insulation Pins:				
CD Weld Pins	A	A	C	A
CD Power Tip Weld Pins	A	A	B	A
Double Pointed Weld Pins	N	N	A	B
CD Cupped Head Weld Pins	A	N	N	N
Short Cycle Weld Studs:				
All SC Styles	N	A	C	A **
** For smaller weld base diameters, results may not be acceptable for application requirements				
Legend:	A - Excellent results			
	B - Good results			
	C - Results are often not acceptable for application requirements			
	N - Not recommended and or suitable for the process			

For assistance in determining the best stud welding equipment options to meet the current and potential applications of your business, please contact your **Complete Stud Welding** sales representative.

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SECTION 2

ARC STUD WELDING — GENERAL & TECHNICAL DETAILS

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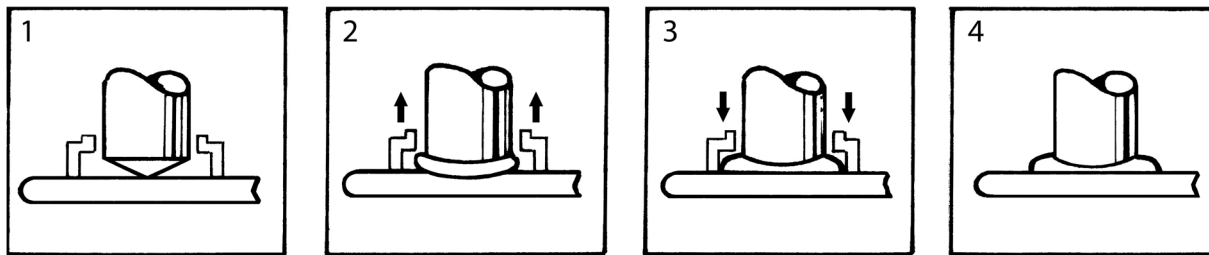
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ARC Stud Welding - General Information

ARC STUD WELDING PROCESS DESCRIPTION

Arc Stud Welding is generally used to weld large diameter fasteners to rougher and thicker base metals. Arc studs may be almost any shape and there are literally hundreds; however, they must have one end of the fastener designed for arc welding. Mild steel, stainless steel, and aluminum are applicable materials for arc stud welding.

Arc Stud Welding is a split second, one sided, no hole process producing a weld stronger than the base material and the stud itself.



1) The weld gun is positioned over the base material and the main gun spring is partially compressed.

2) The trigger is pressed and the stud lifts off the base material drawing an arc. The arc melts the end of the weld stud and the base material below. The arc shield (ferrule) concentrates the heat below the weld stud and contains the molten metal within the weld zone.

3) The main spring plunges the weld stud down into the molten pool of metal in the base material. The cycle is completed in less than a second and the resulting weld bond develops the full strength of the fastener in the weld zone.

4) The weld gun is withdrawn from the weld stud leaving the ferrule. The ferrule is then broken away and discarded.

ARC Stud Welding - General Information

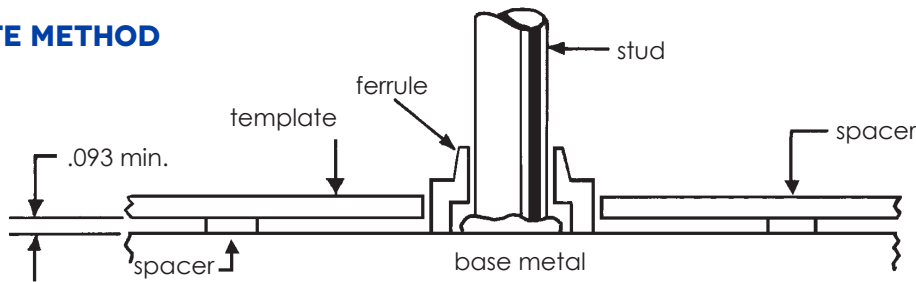
ARC STUD LOCATING: CENTER PUNCH, TEMPLATE & BUSHING DESIGN

CENTER PUNCH METHOD

By making a center punch mark in the base material the operator can place the fluxed tip of the stud into the punch mark for locating the ARC Stud. Contact your

Complete Stud Welding Sales Representative for proper set-up of the stud welding gun for welding with a center punch.

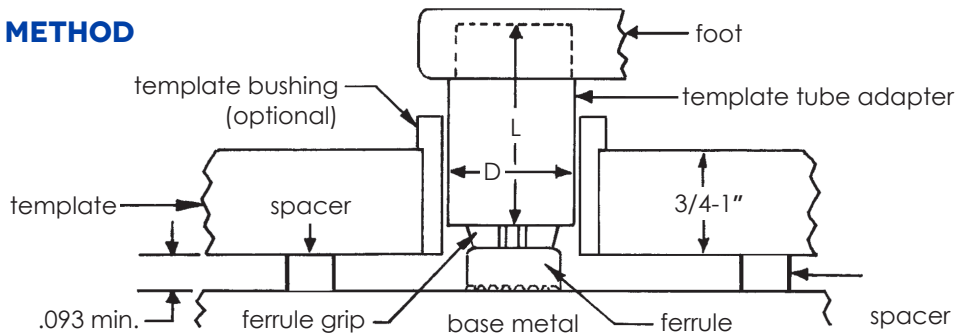
TEMPLATE METHOD



This method of templating is recommended by **Complete Stud Welding** for use with ferrules. The template is usually a steel plate $3/32"$ to $3/16"$ thick. Spacers are required to allow the gases to escape during the welding cycle. The ferrule can be held by a standard ferrule grip or where clearance is prohibitive a tube type set-up can

be used. The recommended hole size on the template to locate the ferrules should equal the maximum outside diameter of the ferrule plus $1/32"$. Holes may be drilled or bored at required locations. See stud specification sheets for ferrule details. For further assistance contact your **Complete Stud Welding** representative.

BUSHING METHOD



This method of templating is recommended by **Complete Stud Welding** for use with all arc stud styles. The design makes it possible to accurately hold angular alignment of the studs as well as stud location. The template should be made of ebonite or masonite of a thickness sufficient to afford good alignment. Template bushings may be used to insure greater accuracy and extend the life of the

template. Standard ferrule grips are used with the tube adapter. This permits standardization of templates since it is only necessary to change the ferrule grip to weld studs of different diameters. The hole diameter of the bushing or template should be approximately .010 larger than the maximum outside diameter of the template tube adapter.

ARC Template Tube Adapters

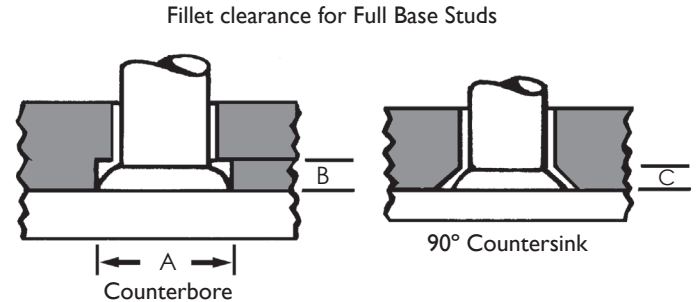
Part Number	Stud Size	D	L
MT-0008	1/2" and under	1.250	2.000
MT-0012	5/8" and 3/4"	1.562	2.500
MT-0016	7/8" and larger	2.125	2.500

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ARC Stud Welding - General Information

ACCOMMODATING THE FILLET

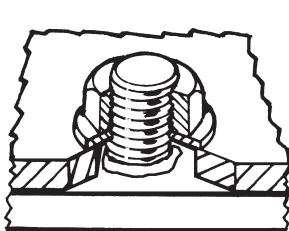
Stud Size (in.)	Counterbore (in.)		90° Countersink
	A	B	C
1/4	.0437	0.125	0.125
5/16	0.500	0.125	0.125
3/8	0.593	0.125	0.125
7/16	0.656	0.187	0.125
1/2	0.750	0.187	0.187
5/8	0.875	0.218	0.187
3/4	1.125	0.312	0.187



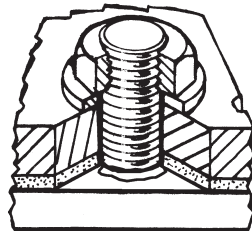
When the arc stud is welded, a fillet forms around its base with the dimensions being closely controlled by the design of the ferrule. Since the diameter of the fillet is generally larger than the diameter of the stud, some consideration is required in the design of mating parts. Counterbore and countersink methods are commonly used. Dimensions will vary with studs and ferrules.

ADDITIONAL METHODS OF ACCOMMODATING THE FILLET

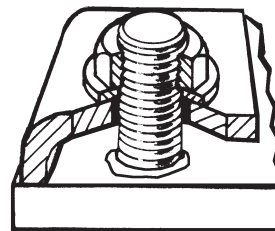
Additional methods of accommodating the fillet include oversized clearance holes, use of a dog-type construction or use of a gasket material around the fillet.



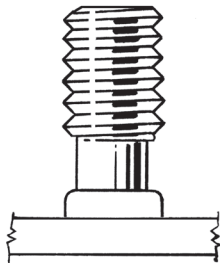
A) Oversize clearance hole



B) Gasket material



C) Dog clamp



Reduced Base Studs are designed so that the weld fillet does not exceed the maximum diameter of the fastener. This design is not recommended if full thread diameter fastener strength is required.

ARC Stud Welding - General Information

RECOMMENDED MINIMUM BASE METAL THICKNESS

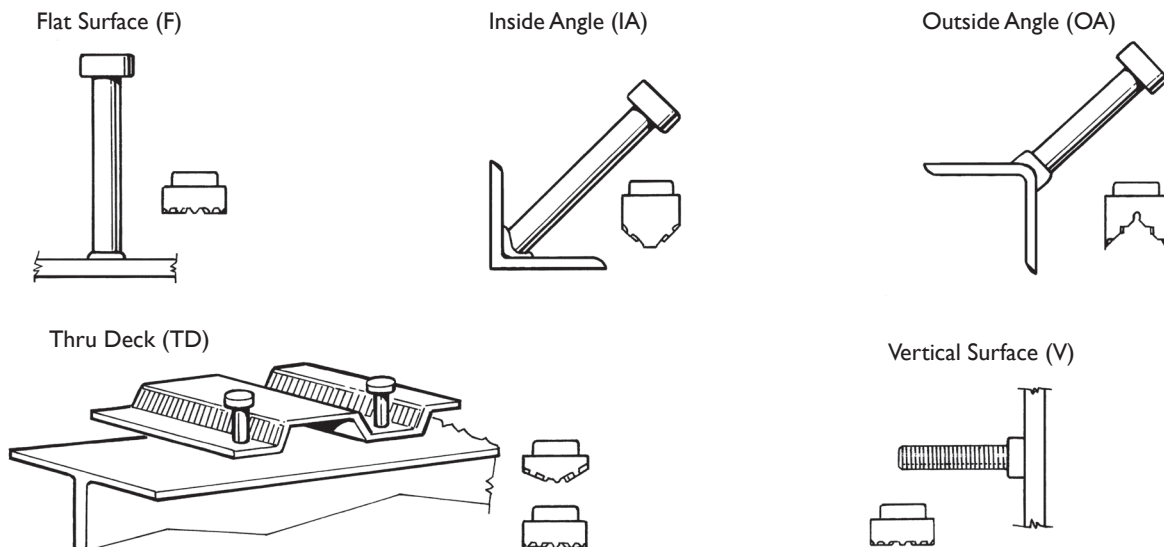
Stud Weld Base Dia. (in.)	Steel		Aluminum	
	Without Backup (in.)	(gage)	Without Backup (in.)	With Backup (in.)
0.187	0.0359	20	0.125	0.125
0.250	0.0478	18	0.125	0.125
0.312	0.0598	16	0.187	0.125
0.375	0.0747	14	0.187	0.187
0.437	0.0897	13	0.250	0.187
0.500	0.1196	11	0.250	0.250
0.625	0.148	9		
0.750	0.187			
0.875	0.250			
1.000	0.375			

SHIELDING THE WELD

In arc stud welding we either shield the weld utilizing gas or ferrules. Gas shielding is primarily used in industrial applications requiring a stud diameter of 1/2" or less. Please contact your **Complete Stud Welding** representative for suggestions on the best gas mixes to utilize.

construction applications requiring weld studs from 1/4" to 1" diameter. Specially designed ferrules are needed for some applications. This would include the need to weld to contoured surfaces and welding at angles to the work. Standard ferrules are available for welding to flat, vertical, inside angle, outside angle and thru-deck surfaces. These are shown below:

Ferrules are commonly used in industrial and



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ARC Stud Welding - Technical Details

THREADED & NO THREAD WELD STUDS – TECHNICAL DETAILS

Threaded & No Thread Weld Studs: Complete Stud Welding has various types of externally and internally threaded weld studs and No Thread weld studs. These weld studs are used in many industrial and construction applications.

Specifications: Complete Stud Welding studs are commonly produced to AWS Specifications D1.1, D1.5 and or D1.6. Threaded weld studs and No Thread weld studs are available upon request to various international specifications. Should Certifications be required, please request these as part of the quotation details and at the time of order.

Threads: The chart below depicts the thread standards for imperial and metric external and internal threads. Unless requested or quoted otherwise, threads will be quoted based on these common thread standards.

Unless indicated or quoted otherwise, external threads will be a rolled type thread. The strength and surface finish of rolled threads are considered to be superior to cut type threads.

Thread Type	External Threads	Internal Threads
Imperial Threads - Coarse	UNC-2A	UNC-2B
Imperial Threads - Fine	UNF-2A	UNF-2B
Metric Threads	Class 6g	Class 6H

Flux: All Standard Arc Welding Studs are flux loaded for diameters greater than 3/16".

Length: The length dimension (L) indicated throughout these specifications is the overall length of the stud Before Weld (BW). The After Weld (AW) length will be shorter based on the stud diameter as depicted in the chart below:

Stud Diameter	Approximate Length Reduction
3/16" thru 1/2"	1/8" or 0.125"
5/8" thru 7/8"	3/16" or 0.188"
1" and larger	1/4" or 0.250"
1/8" thick rectangular	1/8" or 0.125"

Material: Low Carbon Steel weld studs are available in ASTM A108 / A29, Grade C1010 to C1020 material per AWS D1.1. In Stainless Steel, ASTM A-276 / A-493 Grades 302, 304, 316, 321 are options. Stainless threaded weld studs are mostly stocked in grade 302HQ / 30430.

Mechanical Properties		
Parameter	Standard Mild Steel Studs, Type A, Per AWS D1.1	Standard Stainless Steel Studs Per AWS D1.6
Tensile Strength	61,000 PSI Min.	70,000 PSI Min.
Yield Strength (0.2% offset)	49,000 PSI Min.	35,000 PSI Min.
Elongation (% in 2 inch)	17% Min.	40% Min.
Elongation (% in 5x dia.)	14% Min.	—
Reduction of area	50% Min.	N/A

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ARC Stud Welding - Technical Details

THREADED & NO THREAD WELD STUDS – TECHNICAL DETAILS . . . CONTINUED

Plating: All CSW ARC Weld Studs are supplied with a plain finish / unplated condition. Upon request, CSW can provide Zinc Plating, Nickel Plating and Copper Plating. Zinc plated studs must be capped on the weld end to preclude the plating from compromising the weld quality.

Annealing: Standard in stock product is not post annealed. Low carbon steel and stainless steel studs can be annealed to a maximum of 75 Rockwell B hardness and 85 Rockwell B hardness, respectively.

Ferrules: The standard ferrule shipped for each thread diameter is listed on the specification page for each type of threaded weld stud. If other ferrules are desired, please specify at time of order. For other ferrule options please see General Ferrule Specification or contact your CSW representative for assistance.

Accessories: For required accessories, please see each specification page or contact your CSW representative for assistance.

Tensile and Torque Strengths: The 2 charts – Standard ARC Welding Studs – Tensile / Torque Strengths can be found under ARC Stud Welding - General Information.

The data was calculated based on the formulas shown below.

Tensile Load	$L = SA$
Torque	$T = 0.2 \times D \times L$
META*	$A = \pi/4 \times [D - (0.9743/N)]$

A = Mean Effective Thread Area (META)*

L = Tensile Load Pounds

S = Tensile Stress in PSI

D = Nominal Thread Diameter

N = Threads Per Inch

T = Torque in Inch Pounds

*META is used instead of root area in calculating screw strengths because of closer correlation with actual tensile strength. META is based on mean diameter, which is the diameter of an imaginary coaxial cylinder whose surface would pass through the thread profile approximately midway between the minor and pitch diameters.

**Please note, in actual practice a stud should not be used at its yield load. A factor of safety must be applied. It is generally recommended that studs be used at no more than 60% of yield. However the factor of safety may vary up or down, depending on the application. The user will determine the appropriate safety factor.

***Please note, Torque figures based on assumption that excessive deformation of thread has not taken relationship between torque/tension out of its proportional range. All torque figures are shown in foot pounds (ft lbs).

Shear values were calculated at 75% of the Ultimate Tensile Load of the stud.

COMPLETE
STUD WELDING
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ARC Stud Welding - General Information

ARC STUD WELDING GUIDELINES & SETTING

- Keep weld studs and ferrules clean and dry.
- See chart below for approximate settings for proper equipment setup.

Stud Base Diameter			Welding Downhand				Welding Overhead				Welding to a Vertical Surface			
in.	mm	Area in.	Welding Current A	Weld Time Seconds	Lift in.	Plunge in.	Welding Current A	Weld Time Seconds	Lift in.	Plunge in.	Welding Current A	Weld Time Seconds	Lift in.	Plunge in.
1/4	6.4	0.0491	450	.17	0.062	0.125	450	.17	0.062	0.125	450	.17	0.062	0.125
5/16	7.9	0.0767	500	.25	0.062	0.125	500	.25	0.062	0.125	500	.25	0.062	0.125
3/8	9.5	0.1105	550	.33	0.062	0.125	550	.33	0.062	0.125	600	.33	0.062	0.125
7/16	11.1	0.1503	675	.42	0.062	0.125	675	.42	0.062	0.125	750	.33	0.062	0.125
1/2	12.7	0.1964	800	.55	0.062	0.125	800	.55	0.062	0.125	875	.46	0.062	0.125
5/8	15.9	0.3068	1200	.67	0.093	0.187	1200	.67	0.062	0.187	1275	.60	0.062	0.187
3/4	19.1	0.4418	1500	.84	0.093	0.187	1500	.84	0.062	0.187	Consult CSW Sales Representative			
7/8	22.2	0.6013	1700	1.00	.0125	0.250	1700	1.00	0.062	0.250				
1	25.4	0.7854	1900	1.40	0.125	0.250	2050	1.20	0.062	0.250				

- Make sure the negative polarity is to the weld stud gun and ensure a good, clean ground connection.
- Align accessories so they are centered and adjust legs so that 1/8" to 1/4" of the stud protrudes beyond the ferrule.
- Make sure work surface is relatively clean so impurities do not affect weld quality.
- Visually inspect all welds for 360° weld flash and for weld flash color (silver, blue & shiny).
- Check height of welded stud - length reduction equals 1/8" - 3/8".

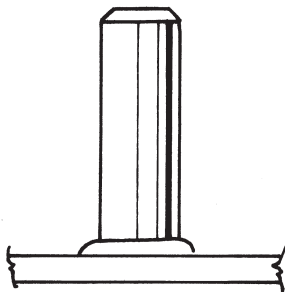
Stud Diameter	Approximate Length Reduction
3/16" thru 1/2"	1/8" or 0.125"
5/8" thru 7/8"	3/16" or 0.188"
1" and larger	1/4" or 0.250"
1/8" thick rectangular	1/8" or 0.125"

- Test the welds at the beginning of each shift or change in stud size. Torque or bend two studs 30 degrees after cooling (AWS Bend Test). See charts for tensile and torque values.

ARC Stud Welding - General Information

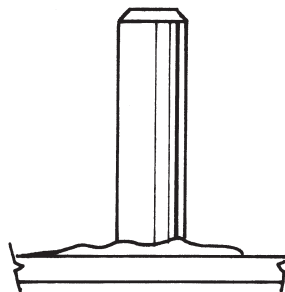
ARC STUD WELD VISUAL INSPECTION

The **Complete Stud Welding** ARC stud weld can be visually inspected by observing the fillet at the base of the stud. The illustrations and comments below will assist you in visually judging the quality of the weld.



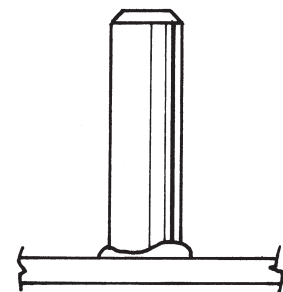
Good Weld

Full, even, shiny fillet all around stud.



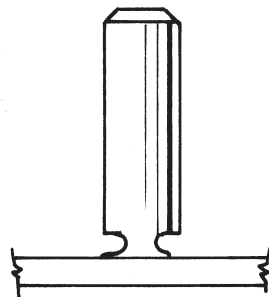
Hot Weld

Very shiny, low profile fillet extending beyond outside of ferrule.



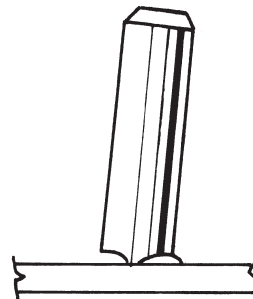
Cold Weld

Small, uneven, dull gray appearing fillet with fingers of metal extending through vents of ferrule.



Short Plunge or Hang-Up

No fillet, no stud burn-off, or undercut base.



Misalignment

Partial or no fillet, undercut, stud not perpendicular to base metal.

ARC Stud Welding - General Information

TENSILE AND TORQUE STRENGTHS

The following 2 charts are Standard ARC Welding Studs –
Tensile / Torque Strengths.

The data was calculated based on the formulas shown below.

Tensile Load	$L = SA$
Torque	$T = 0.2 \times D \times L$
META*	$A = \pi/4 \times [D - (0.9743/N)]$

A = Mean Effective Thread Area (META)*
L = Tensile Load Pounds
S = Tensile Stress in PSI

D = Nominal Thread Diameter
N = Threads Per Inch
T = Torque in Inch Pounds

*META is used instead of root area in calculating screw strengths because of closer correlation with actual tensile strength. META is based on mean diameter, which is the diameter of an imaginary coaxial cylinder whose surface would pass through the thread profile approximately midway between the minor and pitch diameters.

**Please note, in actual practice a stud should not be used at its yield load. A factor of safety must be applied. It is generally recommended that studs be used at no more than 60% of yield. However the factor of safety may vary up or down, depending on the application. The user will determine the appropriate safety factor.

***Please note, Torque figures based on assumption that excessive deformation of thread has not taken relationship between torque/tension out of its proportional range. All torque figures are shown in foot pounds (ft lbs).

Shear values were calculated at 75% of the Ultimate Tensile Load of the stud.

See next 2 pages for charts on Tensile and Torque Strengths.

ARC Stud Welding - General Information

Standard Arc Welding Studs - Tensile / Torque Strengths

Low Carbon Steel - 61,000 PSI Min. Tensile, 49,000 PSI Min. Yield

Thread Size	Thread Diameter (in)	META (In) 2 *	Yield Load (Lbs)**	Ultimate Tensile Load (Lbs)	Yield Torque (ft lbs)***	Ultimate Torque (ft lbs)***	Shear Strength (60% of Tensile Load))
10-24	0.1875	0.017	853	1,061	2.7	3.3	637
10-32	0.1875	0.020	975	1,214	3.0	3.8	728
1/4-20	0.2500	0.032	1,553	1,934	6.5	8.1	1,160
1/4-28	0.2500	0.036	1,774	2,208	7.4	9.2	1,325
5/16-18	0.3125	0.032	1,578	1,964	8.2	10.2	1,179
5/16-24	0.3125	0.058	2,837	3,532	14.8	18.4	2,119
3/8-16	0.3750	0.077	3,788	4,715	23.7	29.5	2,829
3/8-24	0.3750	0.088	4,292	5,344	26.8	33.4	3,206
7/16-14	0.4375	0.106	5,194	6,466	37.9	47.1	3,880
7/16-20	0.4375	0.119	5,807	7,229	42.3	52.7	4,337
1/2-13	0.5000	0.142	6,938	8,638	57.8	72.0	5,183
1/2-20	0.5000	0.160	7,825	9,742	65.2	81.2	5,845
5/8-11	0.6250	0.226	11,054	13,762	115.2	143.4	8,257
5/8-18	0.6250	0.256	12,520	15,586	130.4	162.3	9,351
3/4-10	0.7500	0.334	16,366	20,374	204.6	254.7	12,224
3/4-16	0.7500	0.372	18,248	22,716	228.1	284.0	13,630
7/8-9	0.8750	0.461	22,599	28,133	329.6	410.3	16,880
7/8-14	0.8750	0.509	24,931	31,037	363.6	452.6	18,622
1-8	1.0000	0.605	29,650	36,911	494.2	615.2	22,147
1-14	1.0000	0.679	33,276	41,425	554.6	690.4	24,855
M5 - 0.80	0.1969	0.022	1,062	1,322	3.5	4.3	793
M6 - 1.00	0.2362	0.031	1,506	1,875	5.9	7.4	1,125
M8 - 1.25	0.3150	0.056	2,744	3,416	14.4	17.9	2,050
M10 - 1.50	0.3937	0.089	4,348	5,413	28.5	35.5	3,248
M12 - 1.75	0.4724	0.129	6,322	7,870	49.8	62.0	4,722
M16 - 2.00	0.6299	0.240	11,778	14,662	123.6	153.9	8,797
M20 - 2.50	0.7874	0.376	18,402	22,909	241.5	300.6	13,745
M22 - 2.50	0.8661	0.466	22,832	28,424	329.6	410.3	17,054
M24 - 3.0	0.9449	0.541	26,494	32,983	417.2	519.4	19,790

Please refer to first previous page for explanatory notes and formulas used to calculate the above data.

Please note, it is the users responsibility to determine the appropriate safety factors to apply to the above data.

ARC Stud Welding - General Information

Standard Arc Welding Studs - Tensile / Torque Strengths

Stainless Steel - 70,000 PSI Min. Tensile, 35,000 PSI Min. Yield

Thread Size	Thread Diameter (in)	META (In) 2 *	Yield Load (Lbs)**	Ultimate Tensile Load (Lbs)	Yield Torque (ft lbs)***	Ultimate Torque (ft lbs)***	Shear Strength (60% of Tensile Load)
10-24	0.1875	0.017	609	1,218	1.9	3.8	731
10-32	0.1875	0.020	697	1,393	2.2	4.4	836
1/4-20	0.2500	0.032	1,110	2,219	4.6	9.2	1,331
1/4-28	0.2500	0.036	1,267	2,534	5.3	10.6	1,520
5/16-18	0.3125	0.052	1,827	3,654	9.5	19.0	2,192
5/16-24	0.3125	0.058	2,027	4,053	10.6	21.1	2,432
3/8-16	0.3750	0.077	2,706	5,411	16.9	33.8	3,247
3/8-24	0.3750	0.088	3,066	6,132	19.2	38.3	3,679
7/16-14	0.4375	0.106	3,710	7,420	27.1	54.1	4,452
7/16-20	0.4375	0.119	4,148	8,295	30.2	60.5	4,977
1/2-13	0.5000	0.142	4,956	9,912	41.3	82.6	5,947
1/2-20	0.5000	0.160	5,590	11,179	46.6	93.2	6,707
5/8-11	0.6250	0.226	7,896	15,792	82.3	164.5	9,475
5/8-18	0.6250	0.256	8,943	17,885	93.2	186.3	10,731
3/4-10	0.7500	0.334	11,690	23,380	146.1	292.3	14,028
3/4-16	0.7500	0.372	13,034	26,068	162.9	325.9	15,641
7/8-9	0.8750	0.461	16,142	32,284	235.4	470.8	19,370
7/8-14	0.8750	0.509	17,808	35,616	259.7	519.4	21,370
1-8	1.0000	0.605	21,179	42,357	353.0	706.0	25,414
1-14	1.0000	0.679	23,769	47,537	396.1	792.3	28,522
M5 - 0.80	0.1969	0.022	759	1,518	2.5	5.0	911
M6 - 1.00	0.2362	0.031	1,076	2,152	4.2	8.5	1,291
M8 - 1.25	0.3150	0.056	1,960	3,920	10.3	20.6	2,352
M10 - 1.50	0.3937	0.089	3,106	6,212	20.4	40.8	3,727
M12 - 1.75	0.4724	0.129	4,516	9,031	35.6	71.1	5,419
M16 - 2.00	0.6299	0.240	8,413	16,825	88.3	176.6	10,095
M20 - 2.50	0.7874	0.376	13,145	26,289	172.5	345.0	15,774
M22 - 2.50	0.8661	0.466	16,309	32,617	235.4	470.9	19,570
M24 - 3.0	0.9449	0.541	18,925	37,849	298.0	596.0	22,709

Please refer to second previous page for explanatory notes and formulas used to calculate the above data.
Please note, it is the users responsibility to determine the appropriate safety factors to apply to the above data.

ARC Stud Welding - Technical Details

THREADED & NO THREAD WELD STUDS – TECHNICAL DETAILS WEIGHT CHART – THREADED WELD STUDS

Approximate Weights in Pounds Per 1000 Pieces									
Stud Length	Stud Diameter								
	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	7/8"
3/4	4.6	8.3	12.8	18.8	25.5	34.5			
1	6.1	11.0	17.0	25.0	34.0	46.0	70.0		
1 1/4	7.6	13.8	21.3	31.3	42.5	57.5	87.5	133.8	
1 1/2	9.2	16.5	25.5	37.5	51.0	69.0	105.0	160.5	243.8
1 3/4	10.7	19.3	29.8	43.8	59.5	80.5	122.5	187.3	284.4
2	12.2	22.0	34.0	50.0	68.0	92.0	140.0	214.0	325.0
2 1/4	13.7	24.8	38.3	56.3	76.5	103.5	157.5	240.8	365.6
2 1/2	15.3	27.5	42.5	62.5	85.0	115.0	175.0	267.5	406.3
2 3/4	16.8	30.3	46.8	68.8	93.5	126.5	192.5	294.3	446.9
3	18.3	33.0	51.0	75.0	102.0	138.0	210.0	321.0	487.5
3 1/4	19.8	35.8	55.3	81.3	110.5	149.5	227.5	347.8	528.1
3 1/2	21.4	38.5	57.5	87.5	119.0	161.0	245.0	374.5	568.8
3 3/4	22.9	41.3	61.8	93.8	127.5	172.5	262.5	401.3	609.4
4	24.4	44.0	68.0	100.0	136.0	184.0	280.0	428.0	650.0
4 1/4	25.9	46.8	72.3	106.3	144.5	195.5	297.5	454.8	690.6
4 1/2	27.5	48.5	76.5	112.5	153.0	207.0	315.0	481.5	731.3
4 3/4	29.0	52.3	80.8	118.8	161.5	218.5	332.5	508.3	771.9
5	30.5	55.0	85.0	125.0	170.0	230.0	350.0	535.0	850.0
Each Additional Inch	6.1	11.0	17.0	25.0	34.0	46.0	70.0	107.0	162.5
Ferrule	2.0	2.9	4.3	5.0	5.2	7.5	9.0	28.0	38.0

ARC Stud Welding - Technical Details

THREADED & NO THREAD WELD STUDS – TECHNICAL DETAILS . . . CONTINUED WEIGHT CHART – NO THREADED WELD STUDS

Approximate Weights in Pounds Per 1000 Pieces									
Stud Length	Stud 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	109.6	148.8	194.6	303.1	436.8	595.0
3 3/4	30.0	52.5	81.8	117.4	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	201.9	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	2.0	2.9	4.3	5.0	5.2	7.5	9.0	28.0	38.0

COMPLETE STUD WELDING

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SECTION 3

ARC WELD STUDS

CONCRETE ANCHORS • NO THREAD STUDS (UNTHREADED)
RECTANGULAR STUDS • REFRACTORY ANCHORS • THREADED STUDS
INTERNALLY THREADED • TUFFSTUDS – WEAR PROTECTION

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

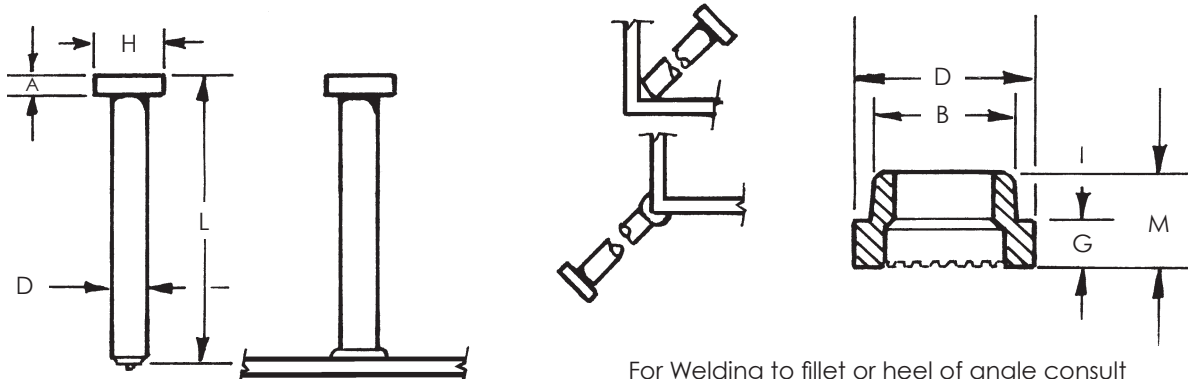
OFFICE: 216.904.4008

EMAIL: SALES@COMPLETESTUDWELD.COM

COMPLETE
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ARC Weld Studs - Concrete Anchors

HCA - HEADED CONCRETE ANCHOR - TECHNICAL DETAILS



For Welding to fillet or heel of angle consult your **Complete Stud Welding** representative for assistance.

Stud Specifications			Ferrule Specifications				
D	H	A	No.	D	B	G	M
1/4	.500	.187	F025-F	.455	.380	.234	.390
3/8	.750	.281	F037-F	.640	.505	.234	.390
1/2	1.000	.281	F050-F	.795	.650	.250	.438
5/8	1.250	.312	F062-F	1.030	.785	.328	.516

Headed Concrete Anchors are used in all types of concrete connections. They can be welded to a flat surface, inside of an angle or outside of an angle.

Specifications – HCA's meet AWS Specifications D1.1, D1.5 and or D1.6. International Specifications BS5950, BS5400, DIN/ISO are available.

Material – Low carbon steel, ASTM A108 / A29, Grade C1010 to C1020. In Stainless Steel, grades 302, 304, 310 and 316 are stocked in some sizes.

Ferrules – Customer to specify ferrule type at time of order.

Length – Lengths are listed before welding. For Stud Diameters (D) 1/2" and smaller the length reduction is roughly 1/8" and for (D) 5/8" the reduction is roughly 3/16". HCA's can be made in any length above the standard minimum.

Accessories – For a complete list of accessories required with each ferrule type, please see next page.

Mechanical Property Requirements

	Type A	Type B
Tensile Strength	61,000 psi min.	65,000 psi min.
Yield Strength	49,000 psi min.	51,000 psi min.
Elongation (% in 2 in.)	17% min.	20% min.
Elongation (% in 5x dia.)	14% min.	15% min.
Reduction of Area	50% min.	50% min.
Type A Studs are general purpose studs.		
Type B Studs are headed, bent, or of other configuration that are used as an essential component in composite beam design and construction.		

COMPLETE
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ARC Weld Studs - Concrete Anchors

HCA – HEADED CONCRETE ANCHOR – ACCESSORY DETAILS

Stud Diameter	Chuck P/N	Ferrule Type	Ferrule P/N	Foot P/N	Grip P/N	Ferrule Foot Plate P/N (Dual Leg)
1/4"	CN-050	Flat	F025-F	B-1C	GC-025	QN-025
		Low Profile	F025-LP	B-1C	GC-025	QN-025
		Heavy Duty	F025-HD	B-1C	GC-037	QN-037
		Inside Angle	F025-IA	B-1C	GD-025	N/A
		Outside Angle	F025-OA	B-1C	GC-025	QN-025
3/8"	CH-037	Flat	F037-F	B-1C	GC-037	QN-037
		Low Profile	F037-LP	B-1C	GC-037	QN-037
		Heavy Duty	F037-HD	B-1C	GC-050	QN-050
		Inside Angle	F037-IA	B-1C	GD-037	N/A
		Outside Angle	F037-OA	B-1C	GC-037	QN-037
		Weld Thru Deck	FO37-TD	B-0021	B-0060-3	N/A
1/2"	CH-050	Flat	F050-F	B-1C	GC-050	QN-050
		Low Profile	F050-LP	B-1C	GC-050	QN-050
		Vertical	F050-V	B-1C	GC-050	QN-050
		Heavy Duty	F050-HD	B-2C	GC-062	QN-062
		Inside Angle	F050-IA25	B-1C	GD-050	N/A
		Inside Angle	F050-IA37	B-1C	GD-050	N/A
		Outside Angle	F050-OA	B-1C	GC-050	QN-050
		Weld Thru Deck	F050-TD	B-0021	B-0060-2	N/A
5/8"	CH-075	Flat	F062-F	B-2C	GC-062	QN-062
		Low Profile	F062-LP	B-2C	GC-062	QN-062
		Vertical	F062-V	B-2C	GC-062	QN-062
		Heavy Duty	F062-HD	B-2C	GC-075	QN-075
		Inside Angle	F062-IA25	B-2C	GD-062	N/A
		Inside Angle	F062-IA37	B-2C	GD-062	N/A
		Outside Angle	F062-OA	B-2C	GN-062	QN-062
		Weld Thru Deck	F062-TD	B-0021	B-0060-2	N/A

ARC Weld Studs - Concrete Anchors

HCA - HEADED CONCRETE ANCHOR - STANDARD SIZES

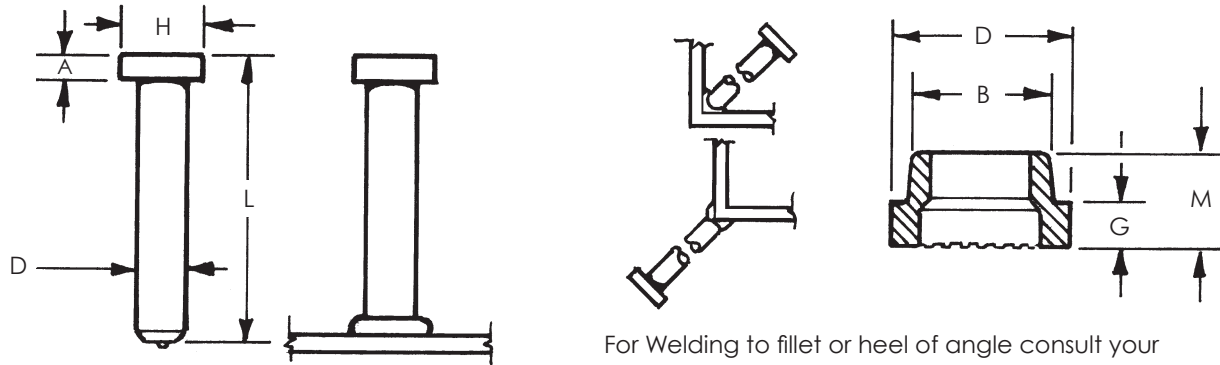
Specifications			Packaging Detail			Weights - in pounds		
Diameter	Length	CSW Part Number (mild steel)	Pieces Per Box	Boxes Per Pallet	Pieces Per Pallet	Box Weight	Pallet Weight	1,000 Pcs. Weight
D	L							
1/4	1 - 1/8	HCAM0250112	2,000	27	54,000	48	1,296	24
	2 - 11/16	HCAM0250268	1,000	27	27,000	45	1,215	45
	3 - 1/8	HCAM0250312	1,000	27	27,000	51	1,377	51
	4 - 1/8	HCAM0250412	600	27	16,200	39	1,053	65
3/8	1 - 1/8	HCAM0370112	1,000	27	27,000	70	1,890	70
	1 - 5/8	HCAM0370162	1,000	27	27,000	79	2,133	79
	2 - 1/8	HCAM0370212	700	27	18,900	67	1,809	96
	2 - 5/8	HCAM0370262	600	27	16,200	66	1,782	110
	3 - 1/8	HCAM0370312	500	27	13,500	62	1,674	124
	4 - 1/8	HCAM0370412	350	27	9,450	55	1,485	157
	5 - 1/8	HCAM0370512	300	27	8,100	56	1,512	187
	6 - 1/8	HCAM0370612	200	27	5,400	44	1,188	220
1/2	8 - 1/8	HCAM0370812	250	27	6,750	69	1,863	276
	1 - 1/8	HCAM0500112	600	27	16,200	68	1,836	113
	1 - 1/2	HCAM0500150	500	27	13,500	68	1,836	136
	1 - 5/8	HCAM0500162	450	27	12,150	64	1,728	142
	2 - 1/8	HCAM0500212	400	27	10,800	67	1,809	168
	2 - 5/8	HCAM0500262	350	27	9,450	71	1,917	203
	3 - 1/8	HCAM0500312	300	27	8,100	68	1,836	227
	4 - 1/8	HCAM0500412	200	27	5,400	56	1,512	280
	5 - 5/16	HCAM0500531	150	27	4,050	52	1,404	347
	6 - 1/8	HCAM0500612	125	27	3,375	49	1,323	392
	8 - 1/8	HCAM0500812	100	27	2,700	50	1,350	500
	10 - 1/8	HCAM0501012	75	27	2,025	51	1,377	680
5/8	12 - 1/8	HCAM0501212	1500	1	1500	1095	1120	1095
	1 - 7/16	HCAM0620143	400	27	10,800	85	2,295	213
	1 - 11/16	HCAM0620168	325	27	8,775	77	2,079	237
	1 - 15/16	HCAM0620193	300	27	8,100	78	2,106	260
	2 - 1/8	HCAM0620212	250	27	6,750	68	1,836	272
	2 - 3/16	HCAM0620218	250	27	6,750	71	1,917	284
	2 - 11/16	HCAM0620268	250	27	6,750	81	2,187	324
	3 - 3/16	HCAM0620318	200	27	5,400	75	2,025	375
	3 - 11/16	HCAM0620368	150	27	4,050	75	1,674	413
	4 - 3/16	HCAM0620418	150	27	4,050	62	1,863	460
	4 - 11/16	HCAM0620468	125	27	3,375	69	1,701	504
	5 - 3/16	HCAM0620518	100	27	2,700	55	1,485	550
	6 - 9/16	HCAM0620656	90	27	2,430	55	1,485	611
	8 - 3/16	HCAM0620818	80	27	2,160	52	1,404	650
	9 - 3/16	HCAM0620918	150	9	1,350	117	1,053	780
	10 - 3/16	HCAM0621018	100	9	900	98	882	980

For non standard sizes contact your Complete Stud Welding Representative.

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ARC Weld Studs - Concrete Anchors

HSC – HEADED SHEAR CONNECTORS – TECHNICAL DETAILS



Stud Specifications			Ferrule Specifications				
D	H	A	No.	D	B	G	M
3/4	1-1/4	3/8	F075-F	1.218	1.030	.469	.656
3/4 *	1-1/4	3/8	F075-TD	1.335	1.210	.406	.600
7/8	1-3/8	3/8	F087-F	1.406	1.210	.545	.732
1	1-5/8	1/2	F100-F	1.610	1.406	.632	.820

* For 3/4" weld thru-deck only

Headed Shear Connectors are designed for composite construction to secure the concrete to the steel beams and to resist shear loadings between the concrete slab and steel beam.

Specifications – HSC's meet AWS Specifications D1.1, D1.5 and or D1.6. International Specifications BS5950, BS5400, DIN/ISO are available.

Material – Low carbon steel, ASTM A108 / A29, Grade C1010 to C1020. In Stainless Steel, grades 302, 304, 316 and 316 are stocked in some sizes.

Ferrules – Customer to specify ferrule type at time of order.

Length – Lengths are listed before welding. For Stud Diameters (D) 3/4" and 7/8" the length reduction is roughly 3/16" and for (D) 1" the reduction is roughly 1/4". For Weld Thru-deck the length reduction is roughly 3/8". HSC's can be made in any length above the standard minimum. The standard stock lengths are usually the most cost effective option.

Accessories – For a complete list of accessories required with each ferrule type, please see next page.

Mechanical Property Requirements		
	Type A	Type B
Tensile Strength	61,000 psi min.	65,000 psi min.
Yield Strength	49,000 psi min.	51,000 psi min.
Elongation (% in 2 in.)	17% min.	20% min.
Elongation (% in 5x dia.)	14% min.	15% min.
Reduction of Area	50% min.	50% min.
Type A Studs are general purpose studs.		
Type B Studs are headed, bent, or of other configuration that are used as an essential component in composite beam design and construction.		

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HSC – HEADED SHEAR CONNECTORS – ACCESSORY DETAILS

Stud Diameter	Chuck P/N	Ferrule Type	Ferrule P/N	Foot P/N	Grip P/N	Ferrule Foot Plate P/N (Dual Leg)
3/4	CH-075	Flat	F075-F	B-2C	GC-075	QN-075
		Low Profile	F075-LP	B-2C	GC-075	QN-075
		Vertical	F075-V	B-2C	GC-075	QN-075
		Inside Angle	F075-IA37	B-2C	GD-075	N/A
		Inside Angle	F075-IA50	B-2C	GD-075	N/A
		Outside Angle	F075-OA	B-2C	GC-075	QN-075
		Weld Thru Deck (WTD)	F075-TD	B-002I	B-0060-I	N/A
7/8	CH-087	Flat	F087-F	B-3C	GC-087	QN-087
		Vertical	F087-V	B-3C	GC-087	QN-087
		Outside Angle	F-087-OA	B-3C	GC-087	QN-087
		Weld Thru Deck (WTD)	F087-TD	B-002I	B-0060-4	N/A
1 inch	CH-100	Flat	F100-F	B-3C	GC-100	QN-100
		Flat	F100-F	B-002I	B-0060-4	QN-100

ARC Weld Studs - Concrete Anchors

HSC – HEADED SHEAR CONNECTORS – 3/4" STANDARD SIZES

Specifications			Packaging Detail			Weights - in pounds		
Diameter	Length	CSW Part Number (mild steel)	Pieces Per Box	Boxes Per Pallet	Pieces Per Pallet	Box Weight	Pallet Weight	1,000 Pcs. Weight
D	L							

TYPICAL BARE BEAM SIZES

3/4	3 - 3/16	HSCM0750318	125	48	6,000	60	2,880	480
	3 - 11/16	HSCM0750368	100	48	4,800	55	2,640	550
	4 - 3/16	HSCM0750418	100	48	4,800	63	3,024	630
	4 - 11/16	HSCM0750468	75	27	2,025	51	1,377	680
	5 - 3/16	HSCM0750518	60	48	2,880	43	2,064	717
	5 - 11/16	HSCM0750568	60	48	2,880	47	2,256	783
	6 - 3/16	HSCM0750618	60	48	2,880	51	2,448	850
	6 - 11/16	HSCM0750668	80	27	2,160	75	2,025	938
	7 - 3/16	HSCM0750718	60	27	1,620	59	1,593	983
	8 - 3/16	HSCM0750818	50	27	1,350	56	1,512	1,120
	9 - 3/16	HSCM0750918	100	9	900	123	1,107	1,230
	10 - 3/16	HSCM0751018	100	9	900	137	1,233	1,370
	12 - 3/16	HSCM0751218	1,100	1	1,100	1,760	1,760	1,600
	16 - 3/16	HSCM0751618	1,000	1	1,000	2,000	2,000	2,000

For non standard sizes, please contact your **Complete Stud Welding** representative.

TYPICAL WELD THRU-DECK SIZES

3/4	3 - 3/8	HSCM0750337	125	48	6,000	62	2,976	496
	3 - 7/8	HSCM0750387	100	48	4,800	58	2,784	580
	4 - 3/8	HSCM0750437	100	48	4,800	62	2,976	620
	4 - 7/8	HSCM0750487	75	48	3,600	51	2,448	680
	5 - 3/8	HSCM0750537	60	48	2,880	45	2,160	750
	5 - 7/8	HSCM0750587	60	48	2,880	49	2,352	817
	6 - 3/8	HSCM0750637	60	48	2,880	53	2,544	883

For non standard sizes, please contact your **Complete Stud Welding** representative.

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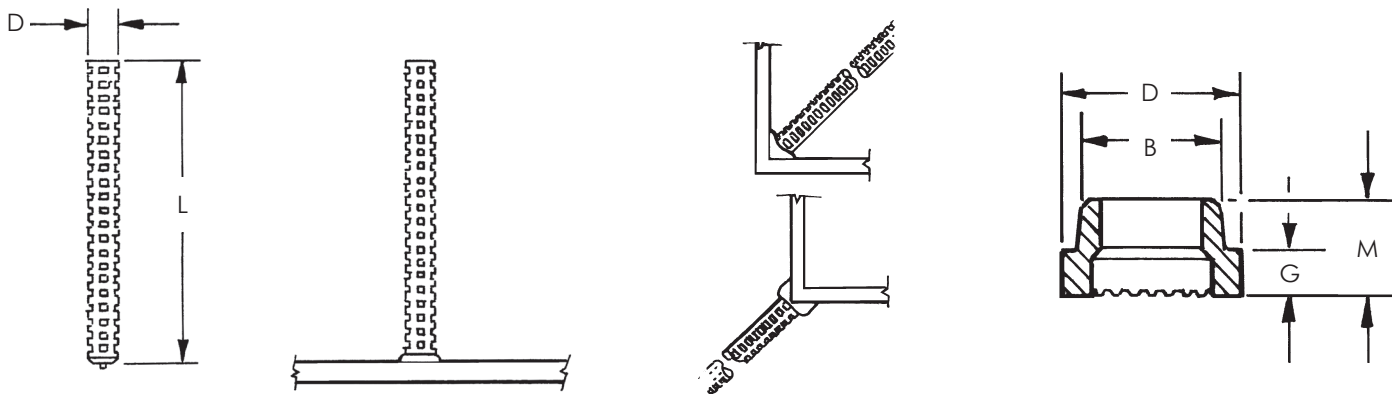
ARC Weld Studs - Concrete Anchors

HSC – HEADED SHEAR CONNECTORS – 7/8” AND 1” STANDARD SIZES

Specifications			Packaging Detail			Weights - in pounds		
Diameter	Length	CSW Part Number (mild steel)	Pieces Per Box	Boxes Per Pallet	Pieces Per Pallet	Box Weight	Pallet Weight	1,000 Pcs. Weight
D	L							
7/8	3 - 3/16	HSCM0870318	100	27	2,700	66	1,782	660
	3 - 1 1/16	HSCM0870368	100	27	2,700	74	1,998	740
	4 - 3/16	HSCM0870418	100	27	2,700	80	2,160	800
	5 - 3/16	HSCM0870518	75	27	2,025	73	1,971	973
	6 - 3/16	HSCM0870618	50	27	1,350	57	1,539	1,140
	7 - 3/16	HSCM0870718	45	27	1,215	59	1,593	1,311
	8 - 3/16	HSCM0870818	40	27	1,080	59	1,593	1,475
	9 - 3/16	HSCM0870918	75	9	675	125	1,125	1,667
	10 - 3/16	HSCM0871018	75	9	675	135	1,215	1,800
	12- 3/16	HSCM0871218	825	1	825	1,793	1,793	2,173
1 inch	3 - 1/4	HSCM1000325	100	27	2,700	74	1,998	740
	4 - 1/4	HSCM1000425	100	27	2,700	80	2,160	800
	5 - 1/4	HSCM1000525	75	27	2,025	73	1,971	973
	6 - 1/4	HSCM1000625	50	27	1,350	57	1,539	1,140
	7 - 1/4	HSCM1000725	45	27	1,215	59	1,593	1,311
	8 - 1/4	HSCM1000825	40	27	1,080	59	1,593	1,475
	9 - 1/4	HSCM1000925	75	9	675	125	1,125	1,667
	10 - 1/4	HSCM1001025	50	9	950	125	1,125	2,500
	12- 1/4	HSCM1001225	600	1	6000	1760	1,760	2,934
For non standard sizes contact you Complete Stud Welding Representative.								

ARC Weld Studs - Concrete Anchors

DBA - DEFORMED BAR ANCHOR - TECHNICAL DETAILS



Stud Specifications		Ferrule Specifications				
D	L	No.	D	B	G	M
3/8	See subsequent page for standard lengths by DBA diameter.	F037-F	.640	.505	.234	.390
1/2		F050-F	.795	.650	.250	.438
5/8		F062-F	1.030	.785	.328	.516
3/4		F075-F	1.218	1.030	.469	.656

Deformed Bar Anchors are designed for weld and bearing plates in concrete connections.

Specifications – DBA's meet AWS Specifications D1.1.

Material – Low carbon steel, ASTM A496

Ferrules – Flat ferrules are provided.

For welding to the inside angle and outside angle refer to the next page for ferrule options.

Length – Lengths are listed before welding. For Stud Diameters (D) 1/2" and smaller the length reduction is roughly 1/8" and for (D) 5/8" and 3/4" the reduction is roughly 3/16".

DBA's can be made in any length above the standard minimum.

Accessories – For a complete list of accessories required with each ferrule type, please see next page.

Mechanical Property Requirements

	Type C
Tensile Strength	80,000 psi min. (552 MPa)
Yield Strength (0.5% offset)	70,000 psi min. (485 MPa)
Type C Studs are cold-worked deformed steel bars manufactured in accordance with specification ASTM A496 having a nominal diameter equivalent to the diameter of a plain wire; having the same weight per foot as the deformed wire. ASTM A496 specifies a maximum diameter of 0.628 in. (16mm). Any bar supplied above that diameter must have the same physical characteristics regarding deformations as required by ASTM A496.	

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ARC Weld Studs - Concrete Anchors

DBA – DEFORMED BAR ANCHOR – ACCESSORY DETAILS

Deformed Bar Anchor - Accessory Detail						
Stud Diameter	Chuck P/N	Ferrule Type	Ferrule P/N	Foot P/N	Grip P/N	Ferrule Foot Plate P/N (Dual Leg)
1/4	CN-025	Flat	F025-F	B-1C	GC-025	QN-025
		Low Profile	F025-LP	B-1C	GC-025	QN-025
		Heavy Duty	F025-HD	B-1C	GC-037	QN-037
		Inside Angle	F025-IA	B-1C	GD-025	N/A
		Outside Angle	F025-OA	B-1C	GC-025	QN-025
3/8	CN-037	Flat	F037-F	B-1C	GC-037	QN-037
		Low Profile	F037-LP	B-1C	GC-037	QN-037
		Heavy Duty	F037-HD	B-1C	GC-050	QN-050
		Inside Angle	F037-IA	B-1C	GD-037	N/A
		Outside Angle	F037-OA	B-1C	GC-037	QN-037
1/2	CN-050	Flat	F050-F	B-1C	GC-050	QN-050
		Low Profile	F050-LP	B-1C	GC-050	QN-050
		Vertical	F050-V	B-1C	GC-050	QN-050
		Heavy Duty	F050-HD	B-2C	GC-062	QN-062
		Inside Angle	F050-IA25	B-1C	GD-050	N/A
		Inside Angle	F050-IA37	B-1C	GD-050	N/A
		Outside Angle	F050-OA	B-1C	GC-050	QN-050
5/8	CN-062	Flat	F062-F	B-2C	GC-062	QN-062
		Low Profile	F062-LP	B-2C	GC-062	QN-062
		Vertical	F062-V	B-2C	GC-062	QN-062
		Heavy Duty	F062-HD	B-2C	GC-075	QN-075
		Inside Angle	F062-IA25	B-2C	GD-062	N/A
		Inside Angle	F062-IA37	B-2C	GD-062	N/A
		Outside Angle	F062-OA	B-2C	GC-062	QN-062
3/4	CN-075	Flat	F075-F	B-2C	GC-075	QN-075
		Low Profile	F075-LP	B-2C	GC-075	QN-075
		Vertical	F075-V	B-2C	GC-075	QN-075
		Inside Angle	F075-IA37	B-2C	GD-075	N/A
		Inside Angle	F075-IA50	B-2C	GD-075	N/A
		Outside Angle	F075-OA	B-2C	GC-075	QN-075

ARC Weld Studs - Concrete Anchors

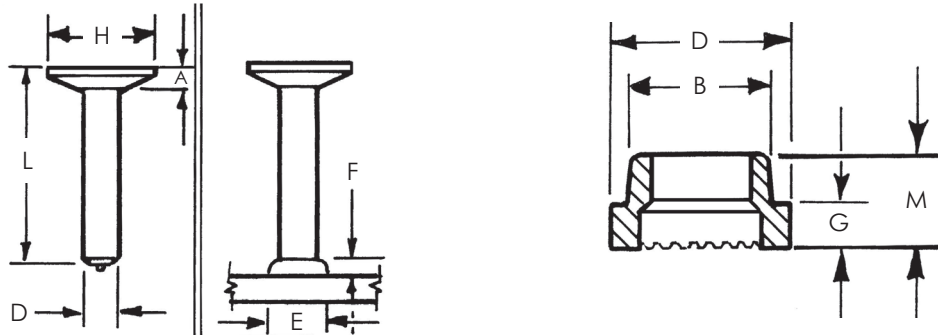
DBA – DEFORMED BAR ANCHOR – STANDARD SIZES

Specifications			Packaging Detail			Weights - in pounds		
Diameter	Length	CSW Part Number (mild steel)	Pieces Per Box	Boxes Per Pallet	Pieces Per Pallet	Box Weight	Pallet Weight	1,000 Pcs. Weight
D	L							
3/8	10 - 1/8	DBA0371012	150	18	2,700	46	828	307
	12 - 1/8	DBA0371212	150	18	2,700	55	990	367
	18 - 1/8	DBA0371812	150	12	1,800	80	960	533
	24 - 1/8	DBA0372412	150	8	1,200	108	864	720
	30 - 1/8	DBA0373012	150	7	1,050	130	910	867
	36 - 1/8	DBA0373612	150	6	900	156	936	1,040
	48 - 1/8	DBA0374812	150	6	900	208	1,248	1,387
1/2	8 - 1/8	DBA0500812	100	18	1,800	44	792	440
	10 - 1/8	DBA0501012	100	18	1,800	54	972	540
	12 - 1/8	DBA0501212	100	18	1,800	67	1,206	670
	18 - 1/8	DBA0501812	100	12	1,200	98	1,176	980
	24 - 1/8	DBA0502412	100	8	800	128	1,024	1,280
	30 - 1/8	DBA0503012	100	7	700	160	1,120	1,600
	36 - 1/8	DBA0503612	100	6	600	192	1,152	1,920
	42 - 1/8	DBA0504212	100	6	600	222	1,332	2,220
	48 - 1/8	DBA0504812	100	6	600	256	1,536	2,560
	60 - 1/8	DBA0506012	100	1	100	314	314	3,140
5/8	12 - 3/16	DBA0621218	50	18	900	51	918	1,020
	18 - 3/16	DBA0621818	50	12	600	76	912	1,520
	24 - 3/16	DBA0622418	50	8	400	102	816	2,040
	30 - 3/16	DBA0623018	50	7	350	126	882	2,520
	36 - 3/16	DBA0623618	50	6	300	151	906	3,020
	42 - 3/16	DBA0624218	50	8	400	176	1,408	3,520
	48 - 3/16	DBA0624818	50	6	300	197	1,182	3,940
3/4	12 - 3/16	DBA0751218	40	18	720	60	1,080	1,500
	18 - 3/16	DBA0751818	40	12	480	87	1,044	2,175
	24 - 3/16	DBA0752418	40	8	320	115	920	2,875
	30 - 3/16	DBA0753018	40	6	240	142	852	3,550
	36 - 3/16	DBA0753618	40	6	240	175	1,050	4,375
	42 - 3/16	DBA0754218	40	6	240	205	1,230	5,125
	48 - 3/16	DBA0754818	40	6	240	226	1,356	5,650

For non standard sizes contact your Complete Stud Welding Representative.

ARC Weld Studs - Concrete Anchors

PSR – PUNCHING SHEAR RESISTOR – TECHNICAL DETAILS



Stud Specifications					Ferrule Specifications			
Diameter	Length Min.	CSW Part Number (mild steel)	Head Diameter	Head Thickness	Ferrule	Major O.D.	Minor O.D.	Height
D	L	P/N	H	A	P/N	D	B	M
3/8	3 - 7/16	PSRM0370343	1.19	.260	F037-F	0.640	0.505	0.390
1/2	2 - 5/8	PSRM0500262	1.58	.330	F050-F	0.795	0.650	0.438
5/8	3 - 3/4	PSRM0620375	1.98	.400	F062-F	1.030	0.785	0.516
3/4	4 - 3/8	PSRM0750437	2.37	.470	F075-F	1.215	1.030	0.656

PSR studs are large-headed shear connectors that are welded to flat steel bars (creating stud rails) and used for shear reinforcement in flat concrete slabs to replace stirrups and column capitals to resist the punching shear stress in the slabs.

Using these PSR stud rails, increases the punching shear capacity at the base of the concrete columns, resulting in a significant reduction in slab thickness. This creates a substantial savings in labor and material costs.

PSR Studs have heat codes stamped on the head that allow traceability to the specific Mill Certification of the stud.

PSR studs are available in any length over the standard minimum.

The ferrule part number provided is for the standard flat down hand position.

The next page details the accessories needed for the Flat type Ferrules indicated above.

Mechanical Property Requirements

Criteria	Type B
Tensile Strength	65,000 PSI min.
Yield Strength	51,000 PSI min.
Elongation (% in 2 in.)	20% min.
Elongation (% in 5 x D)	15% min.
Reduction of Area	50% min.

ARC Weld Studs - Concrete Anchors

PSR PUNCHING SHEAR RESISTOR – ACCESSORY DETAILS

Side Load Chucks			
	Chuck Only	Short Bracket	Long Bracket
Stud Size	Part #	Part #	Part #
3/8	CSLB-037	CSL-037S	CSL-037L
1/2	CSLB-050	CSL-050S	CSL-050L
5/8	CSLB-0562	CSL-062S	CSL-062L
3/4	CSLB-075	CSL-075S	CSL-075L

Side Load Chuck Components	
Component	Part #
Hold Down Finger 3/8, 1/2 & 5/8 Chucks	CSLF
Hold Down Finger 3/4 Chuck	CSLF750
Chuck Isolator	CSLN
Chuck Spring	CSLS
Long Bracket	CSLA-1
Short Bracket	CSLA-2

PSR Twin Leg Ferrule Foot Plate	
Stud Size	Part #
3/8	QNW-037
1/2	QNW-050
5/8	QNW-062
3/4	QNW-075

Other Needed Accessories			
Component	Part #		
Leg Widener	CLSX		
3/8 X 9" Legs (2 pcs.) Gun to Leg Widener L-03709	L-03709		
Legs (2 pcs.) Leg Widener To Foot Plate			
Length to be determined based on stud length. See Arc Stud Welding Legs for stock lengths.			

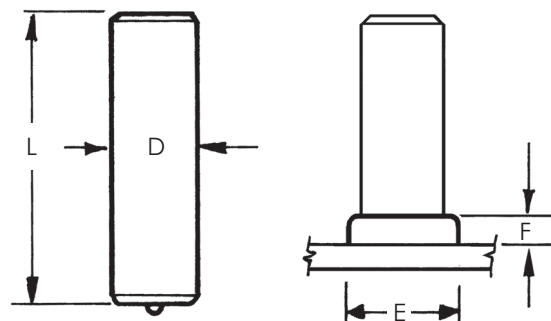
Arc Weld Studs - No Thread Studs

NT – NO THREAD WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding NT weld studs are available in mild steel and stainless steel materials.

NT studs are used as locating pins, spacers, stops, rotational points and tong holds.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications					Standard Accessories		
Base Diameter	Min. Stud Length	Flash Dimensions		Ferrule	Foot	Grip	Chuck
D	L	E	F	P/N	P/N	P/N	P/N
0.250	0.781	0.359	0.109	F025-F	B-1N	GN-025	CN-025
0.312	0.781	0.438	0.109	F031-F	B-1N	GN-031	CN-031
0.375	0.781	0.500	0.125	F037-F	B-1N	GN-037	CN-037
0.437	0.781	0.578	0.141	F043-F	B-1N	GN-043	CN-043
0.500	0.813	0.688	0.156	F050-F	B-1N	GN-050	CN-050
0.625	0.969	0.780	0.188	F062-F	B-2N	GN-062	CN-062
0.680	1.000	0.938	0.250	F075-P	B-2N	GN-075	CN-068
0.750	1.250	1.016	0.250	F075-F	B-2N	GN-075	CN-075
0.875	1.500	1.125	0.313	F087-F	B-3N	GN-087	CN-087
1.000	1.641	1.375	0.375	F100-F	B-3N	GN-100	CN-100

To order or specify give: Stud Code, Diameter, Length

Example: NT, 5/8 x 1.75, (BW), Stainless Steel, 2500 pcs.

Specify (L) Length on a Before Weld basis by indicating "BW"

or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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Arc Weld Studs - No Thread Studs

NBT - BOILER TUBE WELD STUDS - TECHNICAL DETAILS

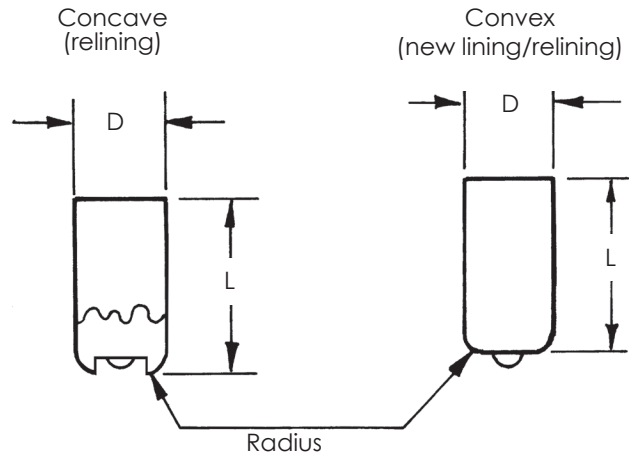
Complete Stud Welding NBT weld studs are available in mild steel and stainless steel materials.

NBT studs are used to secure refractory material and to provide heat dissipation in coal burning boilers. BT studs are commonly made in 430 stainless steel. This stainless typically provides longer stud life than mild steel and is more cost effective than stainless grades 302 and 304.

NBT studs are available in Auto Feed (AF) quality. Please indicate if AF quality is needed.

The "F" ferrules are preferred for welding to flat surfaces. The "C" ferrules are preferred for welding to boiler tubes (i.e. round surfaces).

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications				Standard Accessories			
Base Diameter	Min. Stud Length	Flash Dimensions		Ferrule	Foot	Grip	Chuck
D	L	E	F	P/N	P/N	P/N	P/N
0.375	0.750	0.500	0.125	F037-C	B-IN	GN-037	CN-037
				F037-F	B-IN	GN-037	CN-037
0.500	0.813	0.688	0.156	F050-C	B-IN	GN-050	CN-050
				F050-F	B-IN	GN-050	CN-050

To order or specify give: Stud Code, Diameter, Length, Material, Quantity, Concave or Convex, and Ferrule.

Example: NBT, 3/8 x 1.00, (BW), 430 Stainless Steel, 20000 pcs., Convex, F037-C

Specify (L) Length, on a Before Weld basis by indicating "BW"

or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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Arc Weld Studs - No Thread Studs

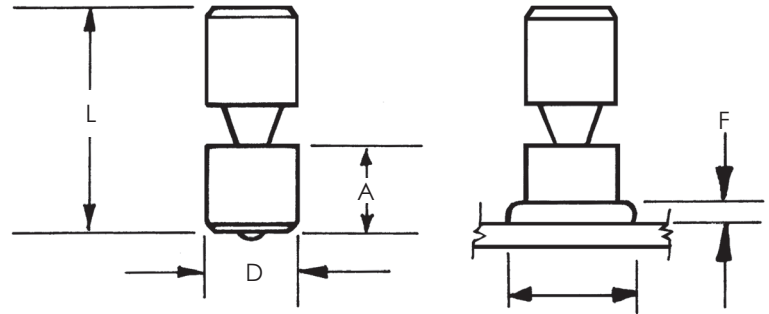
NTK – NO THREAD KNOCK OFF WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding NTK weld studs are available in mild steel and stainless steel materials.

After NTK studs are welded in place the top portion of the stud is knocked off. The welded stud remaining has a shorter height than what is possible to weld with standard No Thread (NT) weld studs.

In addition to being used as locating pins, spacers, stops and rotational points, NTK studs are installed on bridge decking and bridge expansion joints to reduce vehicular skidding. Sometimes called “Anti-Skid” studs.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications					Standard Accessories		
Base Diameter	Minimum Length	Flash Dimensions		Ferrule	Foot	Grip	Chuck
D	L	E	F	P/N	P/N	P/N	P/N
0.250	0.875	0.359	0.109	F025-F	B-1N	GN-025	CN-025
0.312	0.875	0.438	0.109	F031-F	B-1N	GN-031	CN-031
0.375	1.000	0.500	0.125	F037-F	B-1N	GN-037	CN-037
0.437	1.250	0.578	0.141	F043-F	B-1N	GN-043	CN-043
0.500	1.250	0.688	0.156	F050-F	B-1N	GN-050	CN-050
0.625	1.500	0.797	0.188	F062-F	B-2N	GN-062	CN-062
0.750	1.500	0.938	0.250	F075-F	B-2N	GN-075	CN-075
0.875	1.500	1.094	0.313	F087-F	B-3N	GN-087	CN-087
1.000	1.625	1.234	0.375	F100-F	B-3N	GN-100	CN-100

To order or specify give: Stud Code, Diameter, Length (L), Base Length (A), Material and Quantity

Example: NTK, 5/16 x 1.00, KO to .375, (BW), mild steel, 2000 pcs.

**Specify (L) Length, on a Before Weld basis by indicating “BW”
or on an After Weld basis by indicating “AW.”**

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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Arc Weld Studs - No Thread Studs

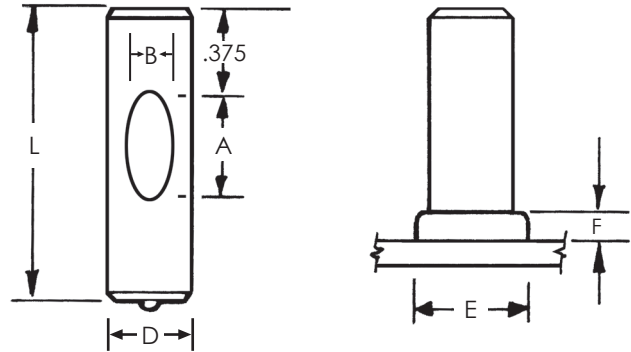
NTH – NO THREAD W/ HOLE WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding NTH weld studs are available in mild steel and stainless steel materials.

NTS studs are commonly used to secure blanket insulation to furnaces, duct work and tanks. Wire is inserted through the stud hole to retain the blanket insulation.

As requested, various diameter NTH studs are supplied with drilled cross holes.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories			
Base Diameter	Overall Length (min.)	Hole Width	Hole Length	Flash Dimensions		Ferrule	Foot	Grip	Chuck
D	L	B	A	E	F	P/N	P/N	P/N	P/N
0.375	1.125	0.156	0.500	0.500	0.125	F037-F	B-1N	GN-037	CN-037
0.500	1.125	0.188	0.500	0.688	0.156	F050-F	B-1N	GN-050	CN-050

To order or specify give: Diameter, Length, Material and Quantity

Example: NTH, 3/8 x 1.50, (BW), mild steel, 1000 pcs.

**Specify (L) Length, on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."**

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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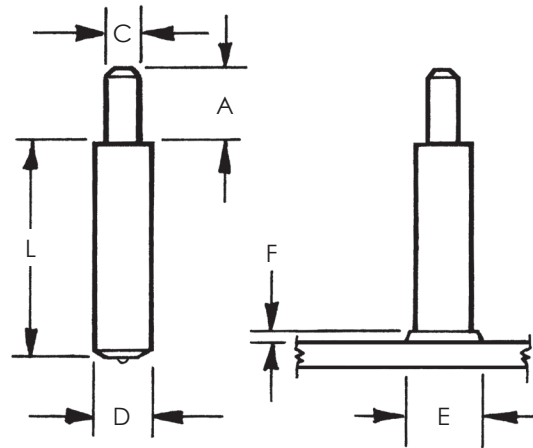
Arc Weld Studs - No Thread Studs

NTS – NO THREAD SHOULDER WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding NTS weld studs are available in mild steel and stainless steel materials.

NTS studs are used for locating pins, spacers, stops, stand offs and rotational points.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories			
Base Diameter	No Thread Diameter	Min. No Thread Length	Min. Length	Flash Dimensions		Ferrule	Foot	Grip	Chuck*
D	C	A	L	E	F	P/N	P/N	P/N	P/N
0.250	Customer to specify this dimension.	0.250	0.312	0.359	0.109	F025-F	B-1N	GN-025	CN-025
0.312		0.250	0.312	0.438	0.109	F031-F	B-1N	GN-031	CN-031
0.375		0.250	0.312	0.500	0.125	F037-F	B-1N	GN-037	CN-037
0.438		0.250	0.350	0.578	0.141	F043-F	B-1N	GN-043	CN-043
0.500		0.250	0.375	0.688	0.156	F050-F	B-1N	GN-050	CN-050
0.625		0.250	0.500	0.797	0.188	F062-F	B-2N	GN-062	CN-062
0.750		0.250	0.625	0.938	0.250	F075-F	B-2N	GN-075	CN-075
0.875		0.250	0.625	1.094	0.313	F087-F	B-3N	GN-087	CN-087
1.000		0.250	0.720	1.250	0.375	F100-F	B-3N	GN-100	CN-100

* Chuck part number shown is for the Base Diameter "D" shown.

To order or specify give: Stud Code, Diameter, Length, C dia., A Dimension, Material and Quantity

Example: NTS, 5/16 x 1.00, (BW), with .188 x .375, mild steel, 2000 pcs.

**Specify (L) Length, on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."**

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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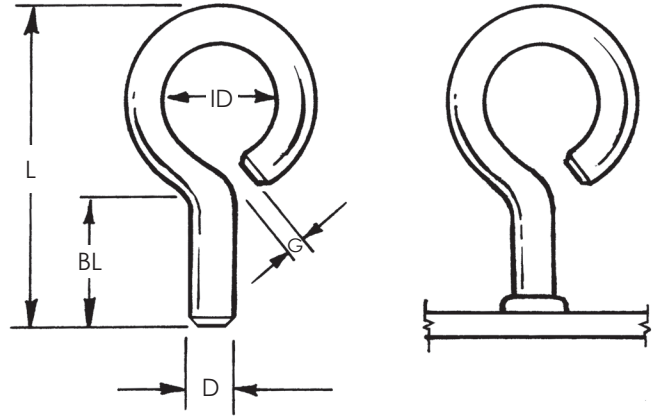
Arc Weld Studs - No Thread Studs

NTE - NO THREAD EYE BOLT WELD STUDS - TECHNICAL DETAILS

Complete Stud Welding NTE weld studs are available in mild steel and stainless steel materials. NTE studs are commonly used for lifting parts and for assembly attachment.

To stud weld NTE studs, special chucks are required and the dual leg ferrule foot plate is preferred.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories		
Base Diameter	Minimum Length	Minimum Base Length	Minimum Inside Diameter	Minimum Opening	Ferrule	Foot	Grip	Chuck
D	L	BL	ID	G	P/N	P/N	P/N	P/N
0.188	1.875	0.750	0.500	0.188	F019-F	QN-018	n/a	EB-018
0.250	1.750	0.750	0.750	0.250	F025-F	QN-025	n/a	EB-025
0.312	1.875	0.750	0.750	0.313	F031-F	QN-031	n/a	EB-031
0.375	2.625	1.000	0.875	0.375	F037-F	QN-037	n/a	EB-037
0.438	3.000	1.125	1.000	0.438	F043-F	QN-043	n/a	EB-043
0.500	2.625	1.375	1.250	0.500	F050-F	QN-050	n/a	EB-050

To order or specify give: Stud Code, D x L; BL; ID; G

Example: NTE, 3/8 x 2.75, 1.125, (BW), 0.875, 0.375, mild steel, 2000 pcs.

**Specify (L) Length, on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."**

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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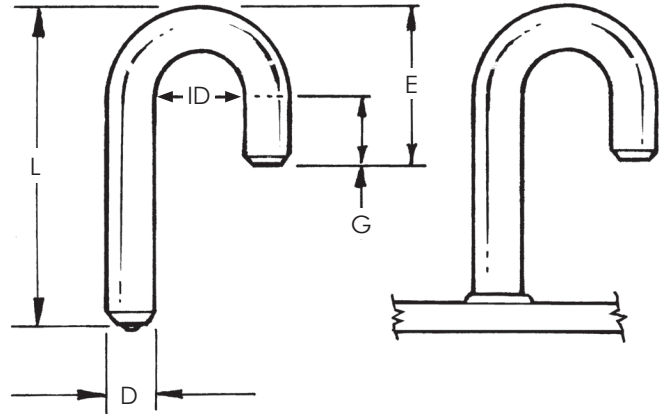
NTJ – NO THREAD “J” BOLT WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding NTJ weld studs are available in mild steel and stainless steel materials.

NTJ studs are commonly used for lifting parts and for assembly attachment.

To stud weld NTJ studs, special chucks are required and the dual leg ferrule foot plate is preferred.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories		
Base Diameter	Minimum Length	Minimum Bend Length	Minimum Inside Diameter	Minimum End Length	Ferrule	Foot	Grip	Chuck
D	L	E	ID	G	P/N	P/N	P/N	P/N
0.188	1.125	1.000	0.500	0.500	F019-F	QN-018	n/a	JB-018
0.250	1.250	1.125	0.625	0.500	F025-F	QN-025	n/a	JB-025
0.312	1.500	1.250	0.750	0.500	F031-F	QN-031	n/a	JB-031
0.375	1.625	1.375	0.875	0.500	F037-F	QN-037	n/a	JB-037
0.438	1.750	1.500	1.000	0.500	F043-F	QN-043	n/a	JB-043
0.500	2.000	1.500	1.000	0.500	F050-F	QN-050	n/a	JB-050
0.625	2.500	1.875	1.500	0.500	F050-F	QN-050	n/a	JB-062

To order or specify give: Stud Code, D x L; E; ID, Material and Quantity

Example: NTJ, 1/2 x 3, (BW), with 2 x 1.25, 304SS, 1000 pcs.

Specify (L) Length, on a Before Weld basis by indicating “BW”

or on an After Weld basis by indicating “AW.”

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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ARC Weld Studs - Rectangular Studs

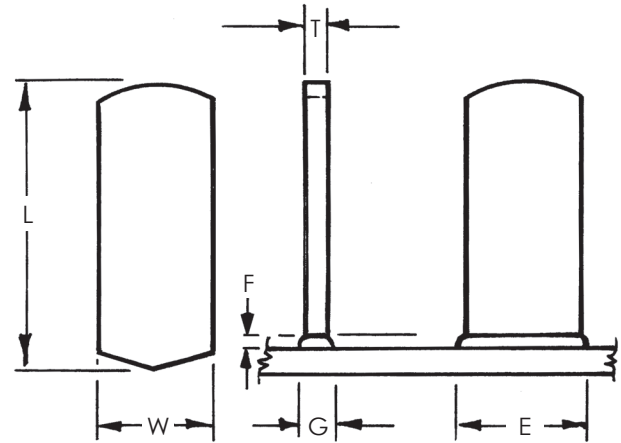
RP – RECTANGULAR PLAIN WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding RP weld studs are available in mild steel and stainless steel materials.

RP studs are commonly used for locating parts in assemblies and for heat dissipation on furnaces and molds.

To stud weld RP studs, rectangular chucks, standard foot pieces and standard ferrule grips are typically used.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications							Standard Accessories		
Thickness*	Width*	Length (Min.)	Flash Dimensions			Ferrule	Foot	Grip	Chuck
T	W	L	E	F	G	P/N	P/N	P/N	P/N
0.125	0.250	0.875	0.300	0.109	0.218	F025-R1	B-1N	GN-037	CR-CA
0.125	0.375	1.000	0.437	0.109	0.218	F037-R1	B-1N	GN-037	CR-CB
0.125	0.625	1.000	0.687	0.109	0.218	F062-R1	B-2N	GN-075	CR-CC
0.125	0.875	1.000	0.937	0.156	0.218	F087-R1	B-3N	GN-087	CR-CH
0.125	1	1.000	1.062	0.156	0.218	F100-R1	B-3N	GN-100	CR-CE
0.250	0.75	1.250	0.840	0.188	0.350	F075-R2	B-2N	GN-075	CR-CF

* Other sizes are available upon request.

To order or specify give: Stud Code, T x W x L, Material and Quantity

Example: RP, 1/8 x 0.625 x 1.25, (BW), mild steel, 1000 pcs.

Specify (L) Length, on a Before Weld basis by indicating "BW"

or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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ARC Weld Studs - Rectangular Studs

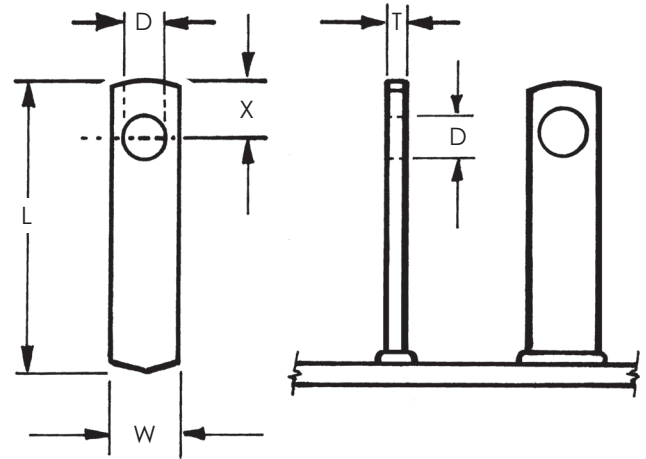
RH - RECTANGULAR W/HOLE WELD STUD - TECHNICAL DETAILS

Complete Stud Welding RH weld studs are available in mild steel and stainless steel materials.

RH studs are commonly used for fastening and attachment purposes. Bolts or wires are installed in the hole to make the connection.

To stud weld RH studs, rectangular chucks, standard foot pieces and standard ferrule grips are typically used.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications					Standard Accessories			
Thickness*	Width*	Length (Min.)	Hole Information		Ferrule	Foot	Grip	Chuck
T	W	L	D	X	P/N	P/N	P/N	P/N
0.125	0.375	1.000	0.203	0.313	F037-R1	B-1N	GN-037	CR-CB
0.125	0.625	1.000	0.313	0.313	F062-R1	B-2N	GN-075	CR-CC

* Other sizes are available upon request.

To order or specify give: Stud Code, T x W x L, w/ D & X, Material and Quantity

Example: RH, 1/8 x 0.625 x 1.50, (BW), with .313 x .313, mild steel, 1000 pcs.

Specify (L) Length, on a Before Weld basis by indicating "BW"

or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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ARC Weld Studs - Rectangular Studs

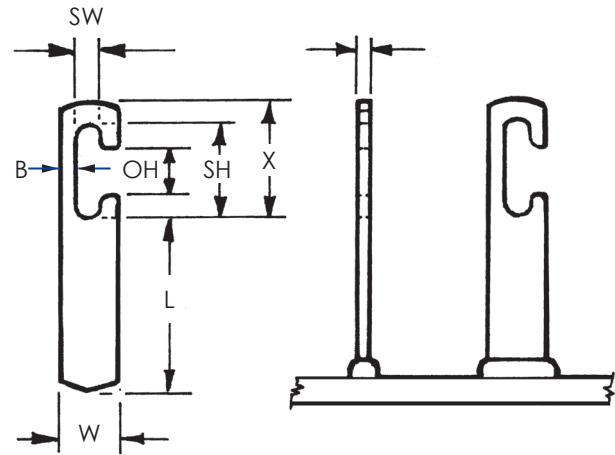
RT - RECTANGULAR "T" SLOT WELD STUDS - TECHNICAL DETAILS

Complete Stud Welding RT weld studs are available in mild steel and stainless steel materials.

RT studs are commonly used for securing wire mesh to furnaces. After installation, the mesh is filled with refractory material.

To stud weld RT studs, rectangular chucks, standard foot pieces and standard ferrule grips are typically used.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications								
Thickness	Width	Length (Min.)	"T" Slot Details					Ferrule
T	W	L	OH	SH	X	B	SW	P/N
0.125	0.375	0.500	0.322	0.531	0.765	0.122	0.130	F037-R1
0.125	0.625	0.500	0.500	1.000	1.250	0.185	0.255	F062-R1

To order or specify give: Stud Code, T x W x L, Material and Quantity

Example: RT, 1/8 x 0.625 x .75, (BW), mild steel, 1000 pcs.

**Specify (L) Length, on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."**

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **Threaded and No-Thread Weld Studs – Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

ARC Weld Studs - Rectangular Studs

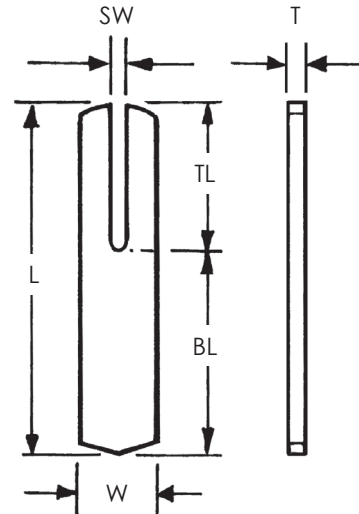
R2 – RECTANGULAR – 2 TINE WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding R2 weld studs are available in mild steel and stainless steel materials.

R2 studs are used to secure refractory materials (blanket, block, cast, gunned and troweled) inside various types of furnaces and chimneys.

To stud weld R2 studs, rectangular chucks, standard foot pieces and standard ferrule grips are typically used.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications							Standard Accessories		
Thickness	Width	Length (Min.)	Length (Min.)	Length (Min.)	Slot Width	Ferrule	Foot	Grip	Chuck
T	W	L	BL	TL	SW	P/N	P/N	P/N	P/N
0.125	0.375	1.250	0.250	1.000	0.125	F037-R-I	B-1N	GN-037	CR-CB
0.125	0.625	1.250	0.625	0.625	0.156	F062-R-I	B-2N	GN-075	CR-CC

To order or specify give: Stud Code, T x W x BL x TL, Material and Quantity

Example: R2, 1/8 x 0.625 x 2 x 1, (BW), 304SS, 1000 pcs.

**Specify (L) Length, on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."**

See RP Weld Stud specifications for the flash dimensions of R2 type studs.

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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ARC Weld Studs - Rectangular Studs

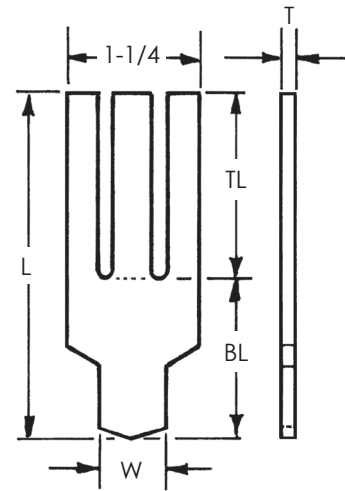
R3 – RECTANGULAR – 3 TINE WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding R3 weld studs are available in mild steel and stainless steel materials.

R3 studs are used to secure refractory materials (blanket, block, cast, gunned and troweled) inside various types of furnaces and chimneys.

To stud weld R3 studs, rectangular chucks, standard foot pieces and standard ferrule grips are typically used.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative



Stud Specifications							Standard Accessories		
Thickness	Width*	Length (Min.)	Length (Min.)	Length (Min.)	Slot Width	Ferrule	Foot	Grip	Chuck
T	W	L	BL	TL	SW	P/N	P/N	P/N	P/N
0.125	0.625	2.250	1.250	1.000	0.156	F062-R1	B-2N	GN-075	CR-CB

*Width represents weld base width.

To order or specify give: Stud Type, T x W x BL x TL, Material and Quantity

Example: R3, 1/8 x 0.625 x 1.50 x 2.5, (BW), Mild Steel, 1000 pcs.

**Specify (L) Length, on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."**

See RP Weld Stud specifications for the flash dimensions of R2 type studs.

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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ARC Weld Studs - Rectangular Studs

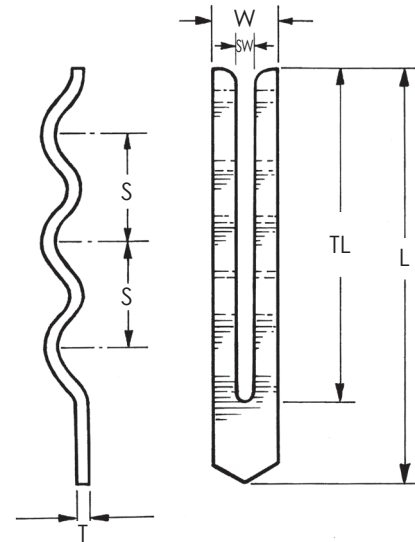
R2W – RECTANGULAR – 2 TINE WIGGLE WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding R2W weld studs are available in mild steel and stainless steel materials.

Like the R2W studs, RW studs are used to secure refractory materials. The bends in the R2W stud help to preclude slippage of the refractory material when in service.

To stud weld RW studs, rectangular chucks, standard foot pieces and standard ferrule grips are typically used.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications							Standard Accessories		
Thickness	Width	Length Range*	Tine Length**	Wiggle Length	Slot Width	Ferrule	Foot	Grip	Chuck
T	W	L	TL	S	SW	P/N	P/N	P/N	P/N
0.125	0.625	2.125 - 3.0	1.625	1.031	0.156	F062-R1	B-2N	GC-075	CR-CC
0.125	0.625	3.125 - 4.0	2.625	1.031	0.156	F062-R1	B-2C	GC-075	CR-CC
0.125	0.625	4.13 - 7.13	3.250	1.031	0.156	F062-R1	B-2C	GC-075	CR-CC
0.125	0.625	5.50 - 8.50	4.625	1.031	0.156	F062-R1	B-2C	GC-075	CR-CC
0.125	0.625	6.88 - 9.88	6.000	1.031	0.156	F062-R1	B-2C	GC-075	CR-CC

* For lengths over 3", the split foot and split grip accessories are depicted.

** Tine Length determines whether 1, 2 or 3 wiggles will be provided.

To order or specify give: Stud Code, T x W x L, Material and Quantity

Example: R2W, 0.125 x 0.625 x 6, (BW), mild steel, 3000 pcs.

Specify (L) Length, on a Before Weld basis by indicating "BW"

or on an After Weld basis by indicating "AW."

See RP Weld Stud specifications for the flash dimensions of RW type studs.

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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ARC Weld Studs - Rectangular Studs

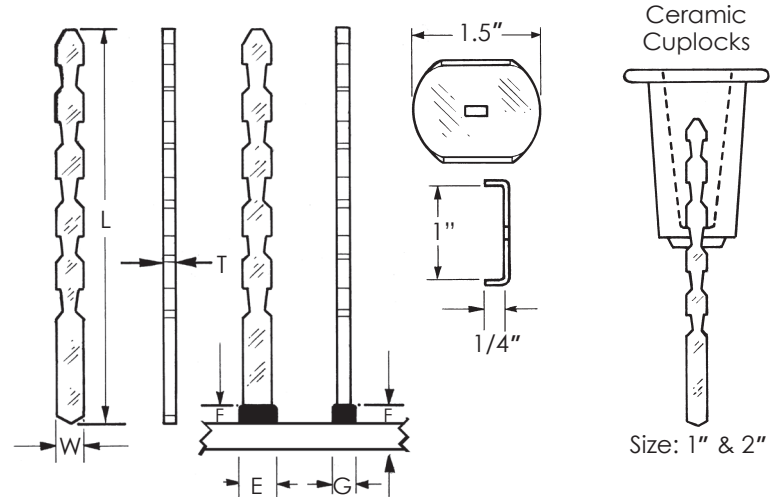
RF – RECTANGULAR FIBER WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding RF weld studs are available in mild steel and stainless steel materials. Material options and temperature limits are as follows:
 304 SS - Temperature up to 1500 degrees F
 310 SS - Temperature up to 1850 degrees F
 330 SS - Temperature up to 2000 degrees F
 601 Inconel - Temperature up to 2150 degrees F

RF studs are used to secure blanket insulation to furnaces. After the insulation is impaled over the RF studs, metal washers and or the ceramic cuplocks are installed and lock on the RF Stud to retain the insulation. The ceramic cuplock can be filled with refractory material or a ceramic plug.

Washers, ceramic cuplocks and cuplock plugs are sold separately. The RF stud and washer must be the same alloy.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories			
Thickness	Width	Length (Min.)	Flash Dimensions			Ferrule	Foot	Grip	Chuck
T	W	L	E	F	G	P/N	P/N	P/N	P/N
0.125	0.250	1.500	0.300	0.109	0.218	F025-RI	B-IC	GC-037	CR-CA

To order or specify give: Stud Code, T x W x L Material and Quantity

Example: RF 0.125 x 0.25 x 5.25, (BW), 601 Inconel, 3000 pcs.

**Specify (L) Length, on a Before Weld basis by indicating "BW"
 or on an After Weld basis by indicating "AW."**

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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ARC Weld Studs - Refractory Anchors

REFRACTORY ANCHORS

This information is under construction.

Please contact your **Complete Stud Welding** representative for assistance.

under construction

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

OFFICE: 216.904.4008

EMAIL: SALES@COMPLETESTUDWELD.COM

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ARC Weld Studs - Externally Threaded

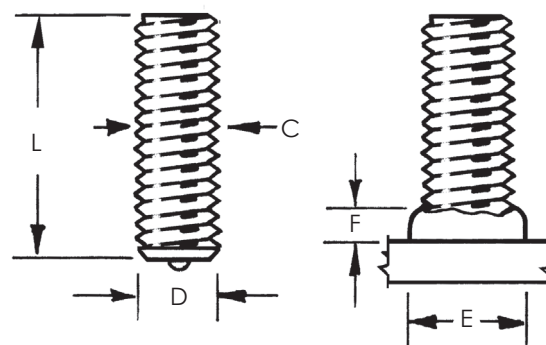
TF – THREADED FULLY WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding TF weld studs are available in mild steel and stainless steel materials.

Coarse and fine threads are available in both imperial (UNC-2A and UNF-2A) and ISO Metric (Class 6g) sizes. The imperial coarse threads are depicted below (UNC-2A) and are standard.

TF studs permit close run down of a nut to the base metal.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories		
Thread Size	Minimum Length	Base Diameter	Flash Dimensions		Ferrule	Foot	Grip	Chuck
C	L	D	E	F	P/N	P/N	P/N	P/N
10-24	0.750	0.159	0.281	0.094	F019-F	B-1N	GN-019	CN-018
10-32	0.750	0.167	0.281	0.094	F019-F	B-1N	GN-019	CN-018
1/4-20	0.750	0.215	0.359	0.109	F025-F	B-1N	GN-025	CN-025
5/16-18	0.750	0.275	0.438	0.109	F031-F	B-1N	GN-031	CN-031
3/8-16	0.750	0.330	0.500	0.125	F037-F	B-1N	GN-037	CN-037
7/16-14	0.875	0.387	0.578	0.141	F043-F	B-1N	GN-043	CN-043
1/2-13	0.875	0.444	0.688	0.156	F050-F	B-1N	GN-050	CN-050
5/8-11	1.000	0.562	0.797	0.188	F062-F	B-2N	GN-062	CN-062
3/4-10	1.250	0.680	0.938	0.250	F075-F	B-2N	GN-075	CN-075
7/8-9	1.375	0.798	1.094	0.313	F087-F	B-3N	GN-087	CN-087
1-8	1.500	0.915	1.234	0.375	F100-F	B-3N	GN-100	CN-100

To order or specify give: Stud Code, C x L Material and Quantity

Example: TF 5/8-11 x 1.75, (BW), Stainless Steel, 2500 pcs.

Specify (L) Length, on a Before Weld basis by indicating "BW" or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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ARC Weld Studs - Externally Threaded

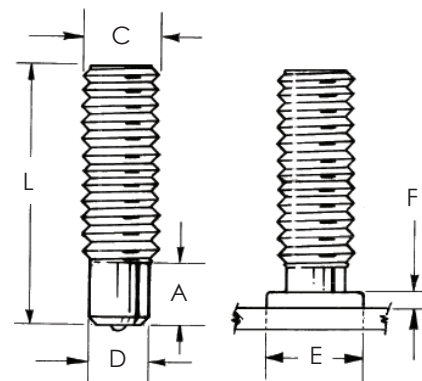
TP – THREADED PARTIALLY WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding TP weld studs are available in mild steel and stainless steel materials.

Coarse and fine threads are available in both imperial (UNC-2A and UNF-2A) and ISO Metric (Class 6g) sizes. The imperial coarse threads are depicted below (UNC-2A) and are standard.

TP studs are used in a wide range of general industrial applications.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories			
Thread Size	Minimum Length	Base Diameter	Base Length	Flash Dimensions		Ferrule	Foot	Grip	Chuck
C	L	D	A	E	F	P/N	P/N	P/N	P/N
1/4-20	0.750	0.215	0.375	0.313	0.094	F025-P	B-1N	GN-025	CN-025
5/16-18	0.750	0.275	0.375	0.406	0.109	F031-P	B-1N	GN-031	CN-031
3/8-16	0.750	0.330	0.375	0.469	0.109	F037-P	B-1N	GN-037	CN-037
7/16-14	0.750	0.387	0.437	0.531	0.125	F043-P	B-1N	GN-043	CN-043
1/2-13	0.875	0.444	0.500	0.594	0.156	F050-P	B-1N	GN-050	CN-050
5/8-11	1.00	0.562	0.625	0.750	0.188	F062-P	B-2N	GN-062	CN-062
3/4-10	1.375	0.680	0.796	0.922	0.250	F075-P	B-2N	GN-075	CN-075
7/8-9	1.375	0.798	0.859	1.047	0.313	F087-P	B-3N	GN-087	CN-087
1-8	1.500	0.915	0.921	1.188	0.344	F100-P	B-3N	GN-100	CN-100

To order or specify give: Stud Code, Diameter, Length, Material and Quantity

Example: TP, 3/8-16 x 1.125, (BW), Mild Steel, 1000 pcs.

Specify (L) Length on a Before Weld basis by indicating "BW" or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, raw material details, plating options, annealing, load strengths and shipping weights.

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ARC Weld Studs - Externally Threaded

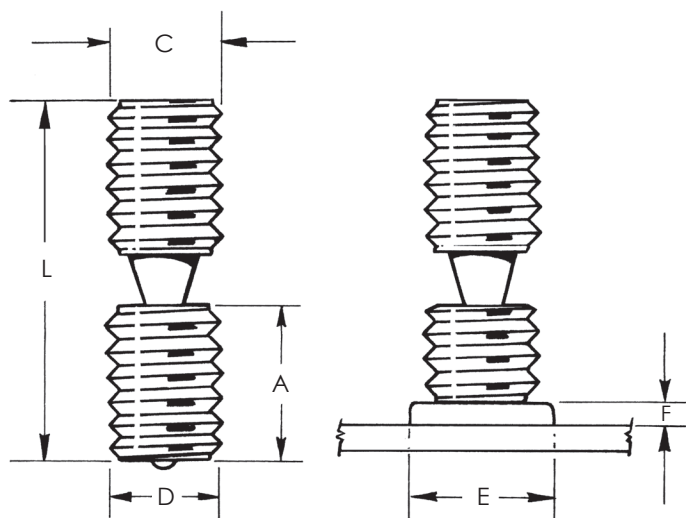
TKO - THREADED KNOCK OFF WELD STUDS - TECHNICAL DETAILS

Complete Stud Welding TKO weld studs are available in mild steel and stainless steel materials. TKO studs are most often made to each customer's order.

Coarse and fine threads are available in both imperial (UNC-2A and UNF-2A) and ISO Metric (Class 6g) sizes. The imperial coarse threads are depicted below (UNC-2A) and are standard.

After TKO studs are welded in place and the top portion of the stud is Knocked off. The welded threaded stud remaining has a shorter threaded length than what is possible with TP and TF type studs.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications							Standard Accessories		
Thread Size	Minimum Length	Base Diameter	Base Length	Flash Dimensions		Ferrule	Foot	Grip	Chuck
C	L	D	A	E	F	P/N	P/N	P/N	P/N
1/4-20	0.875	0.215	0.375	0.359	0.109	F025-F	B-1N	GN-025	CN-025
5/16-18	0.875	0.275	0.375	0.438	0.109	F031-F	B-1N	GN-031	CN-031
3/8-16	1.000	0.330	0.375	0.500	0.125	F037-F	B-1N	GN-037	CN-037
7/16-14	1.250	0.387	0.375	0.578	0.141	F043-F	B-1N	GN-043	CN-043
1/2-13	1.250	0.444	0.500	0.688	0.156	F050-F	B-1N	GN-050	CN-050
5/8-11	1.500	0.562	0.680	0.797	0.188	F062-F	B-2N	GN-062	CN-062
3/4-10	1.500	0.680	0.750	0.938	0.250	F075-F	B-2N	GN-075	CN-075
7/8-9	1.500	0.798	0.750	1.094	0.313	F087-F	B-3N	GN-087	CN-087

To order or specify give: Stud Code, Dimensions C x L x A, Material and Quantity

Example: TKO, 3/8-16 x 1, (BW), KO to .375, 18-8SS, 2200 pcs.

Specify (L) Length on a Before Weld basis by indicating "BW" or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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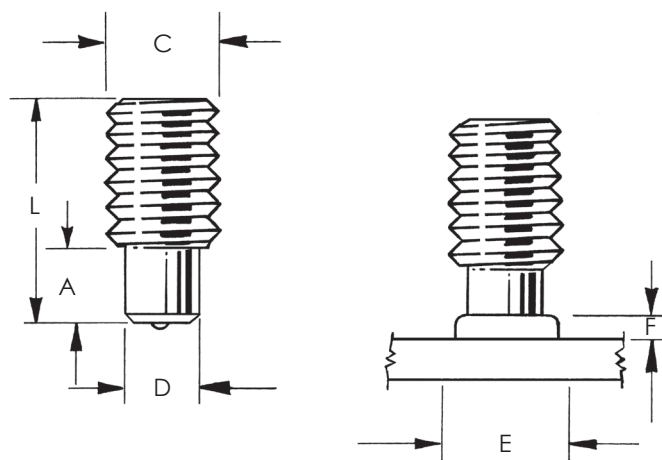
ARC Weld Studs - Externally Threaded

TRB – THREADED REDUCED BASE WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding TRB weld studs are available in mild steel and stainless steel materials. TRB studs are most often made to each customer's order.

TRB studs have a smaller weld base diameter than TP, TF and TFB studs and thus produce a smaller flash diameter. TRB studs permit smaller clearance holes in your design. The load strengths for TRB studs are determined by the weld base diameter.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications							Standard Accessories		
Thread Size	Minimum Length	Base Diameter	Base Length	Flash Dimensions		Ferrule	Foot	Grip	Chuck
C	L	D	A	E	F	P/N	P/N	P/N	P/N
1/4 - 20	0.750	0.187	0.187	0.266	0.125	F025-TB	B-1N	GN-025	CN-025
5/16 - 18	0.750	0.246	0.187	0.313	0.125	F031-TB	B-1N	GN-031	CN-031
3/8 - 16	0.750	0.312	0.375	0.422	0.125	F037-R	B-1N	GN-037	CN-037
7/16 - 14	0.875	0.375	0.375	0.500	0.125	F043-R	B-1N	GN-043	CN-043
1/2 - 13	1.000	0.437	0.437	0.563	0.156	F050-R	B-1N	GN-050	CN-050
5/8 - 11	1.250	0.500	0.547	0.609	0.172	F062-R	B-2N	GN-062	CN-062
3/4 - 10	1.500	0.625	0.797	0.766	0.281	F075-R	B-2N	GN-075	CN-075
7/8 - 9	1.500	0.750	0.922	0.938	0.328	FO75-F	B-3N	GN-075	CN-087
1 - 8	1.750	0.875	1.078	1.063	0.344	F087-F	B-3N	GN-087	CN-100

To order or specify give: Stud Code, Thread size, Length, Unthreaded length, Material and Quantity

Example: TRB, 1/2-13 x 1.50, .437, (BW), Mild Steel, 2500 pcs.

Specify (L) Length on a Before Weld basis by indicating "BW" or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

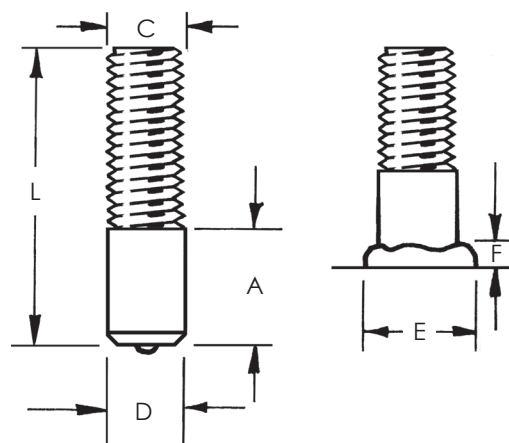
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TFB – THREADED FULL BASE WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding TFB weld studs are available in mild steel and stainless steel materials. TFB studs are most often made to each customer's order.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories			
Thread Size	Minimum Length	Base Diameter	Base Length	Flash Dimensions		Ferrule	Foot	Grip	Chuck
C	L	D	A	E	F	P/N	P/N	P/N	P/N
1/4-20	0.780	0.250	0.187	0.359	0.109	F025-F	B-1N	GN-025	CN-025
5/16-18	0.780	0.312	0.250	0.438	0.109	F031-F	B-1N	GN-031	CN-031
3/8-16	0.780	0.375	0.265	0.500	0.125	F037-F	B-1N	GN-037	CN-037
7/16-14	0.780	0.437	0.281	0.578	0.141	F043-F	B-1N	GN-043	CN-043
1/2-13	1.000	0.500	0.296	0.688	0.156	F050-F	B-1N	GN-050	CN-050
5/8-11	1.234	0.625	0.359	0.797	0.188	F062-F	B-2N	GN-062	CN-062
3/4-10	1.234	0.750	0.500	0.938	0.250	F075-F	B-2N	GN-075	CN-075
7/8-9	1.500	0.875	0.625	1.094	0.313	F087-F	B-3N	GN-087	CN-087
1-8	1.650	1.000	0.750	1.234	0.375	F100-F	B-3N	GN-100	CN-100

To order or specify give: Stud Code, Thread size, Length, Unthreaded length, Material and Quantity

Example: TFB, 3/4-10 x 2, (BW), .75, Mild Steel, 2500 pcs.

Specify (L) Length on a Before Weld basis by indicating "BW"

or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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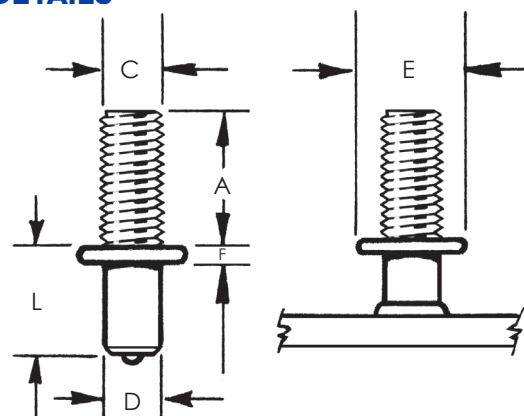
ARC Weld Studs - Externally Threaded

TC – THREADED COLLAR WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding TC weld studs are available in mild steel and stainless steel materials.

TC studs are used to provide a spacer between the base metal and the attached part.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories			
Base Diameter	Min. Length	Max. Thread Diameter	Std. Thread Length	Collar Diameter	Collar Thickness				
D	L	C	A	E	F	Ferrule	Foot	Grip	Chuck
0.215	0.375	1/4 - 20	0.250	0.500	0.125	F025-TC	B-2N	GN-062	CN-025
0.275	0.375	5/16 - 18	0.312	0.578	0.141	F031-TC	B-2N	GN-062	CN-031
0.330	0.375	3/8 - 16	0.375	0.688	0.156	F037-TC	B-2N	GN-062	CN-037
0.446	0.500	1/2 - 13	0.500	0.797	0.188	F050-TC	B-2N	GN-075	CN-050

To order or specify give: Stud Code, Dimensions D x L; C x A, Material and Quantity

Example: TC, .330 x 1 with 3/8-16 x 5/8, (BW), Stainless, 2200 pcs.

**Specify (L) Length on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."**

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

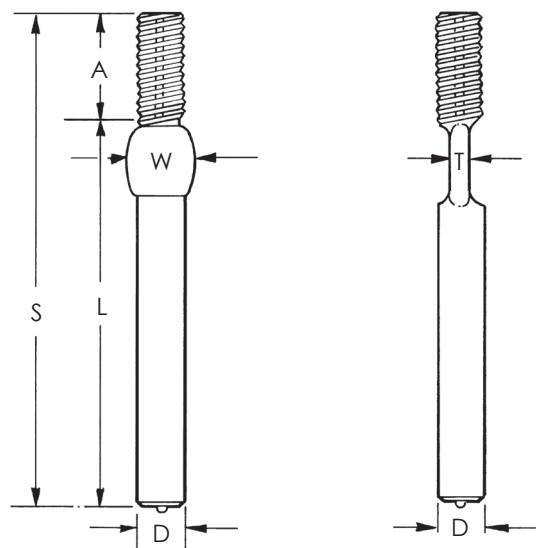
ARC Weld Studs - Externally Threaded

TCC - THREADED COLLAR CRIMPED WELD STUDS - TECHNICAL DETAILS

Complete Stud Welding TCC weld studs are available in mild steel and stainless steel materials.

TCC studs are commonly used in refractory applications for heat recovery power generation systems. After the TCC studs are welded in place and the refractory material installed, the sheet metal skin is placed over the studs and hex nuts installed. The crimped area of the stud supports the sheet metal skin and precludes the skin from compressing the insulation below. See TCW - Threaded Collar Washer and TC - Threaded Collar studs for similar function studs.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications							Standard Accessories		
Base Diameter	Min. Length	Thread Size	Min. Thread Length	Crimp Width	Crimp Thickness	Ferrule	Foot	Grip	Chuck
D	L	C	A	W	T	P/N	P/N	P/N	P/N
0.375	2.000	3/8-16	0.500	0.500	0.218	F037-F	B-1C	GC-037	CN-037
0.500	2.000	1/2-13	0.500	0.625	0.218	F050-F	B-1C	GC-050	CN-050

To order or specify give: Stud Code, D x L x C x A, Material and Quantity

Example: TCC, .50 x 5.0 with 1/2-13 x 1.0, (BW), 18-8 SS, 3800 pcs.

**Specify (L) Length on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."**

TCC stud Flash Dimensions are the same as .375 and .500 Diameter NT studs.

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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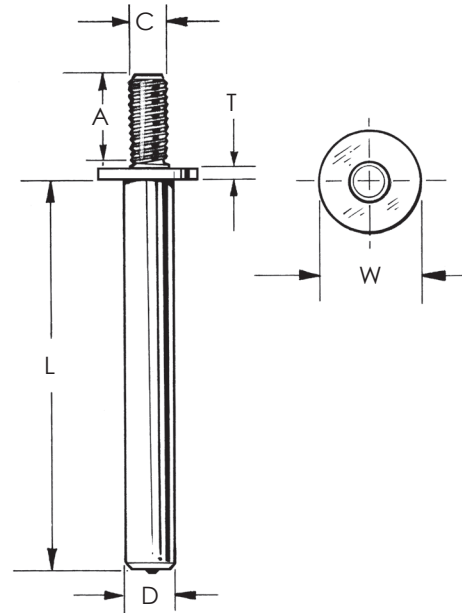
TCW – THREADED COLLAR WASHER WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding TCW weld studs are available in mild steel and stainless steel materials.

TCW studs are commonly used in refractory applications for heat recovery power generation systems. See TCC - Threaded Collar Crimped and TC - Threaded Collar studs for similar function studs.

The washer is installed prior to thread rolling process in order to lock the washer on stud. Washer can not be removed after threads are rolled.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications							Standard Accessories		
Base Diameter	Min. Length	Thread Size	Min. Thread Length	Min. Washer Diameter	Washer Thickness	Ferrule	Foot	Grip	Chuck
D	L	C	A	W	T	P/N	P/N	P/N	P/N
0.500	2.000	3/8-16	0.500	1.000	0.120	F050-F	B-1C	GC-050	CN-037
0.625	2.000	1/2-13	0.500	1.250	0.120	F062-F	B-2C	GC-062	CN-050

To order or specify give: Stud Code, Diameter, Length, C x A, Material and Quantity

Example: TCW, .50 x 5.0 with 1/2-13 x 3/4, (BW), 304 SS, 5000 pcs.

**Specify (L) Length on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."**

TCW stud Flash Dimensions are the same as .500 and .625 Diameter NT studs.

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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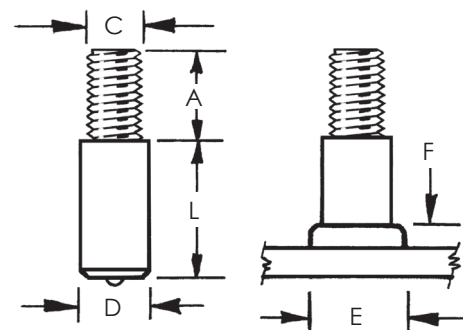
ARC Weld Studs - Externally Threaded

TS – THREADED SHOULDER WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding TS studs are available in mild steel and stainless steel materials. As most TS studs are made to each customer's order, the customer can specify all dimensions when ordering.

TS studs are used to provide a spacer between the base metal and the attached part.

For application and dimensional assistance, contact **Complete Stud Welding** Representative.



Stud Specifications						Standard Accessories			
Base Diameter	Max. Thread Diameter	Min. Thread Length	Min. Base Length	Flash Dimensions		Ferrule	Foot	Grip	Chuck*
D	C	A	L	E	F	P/N	P/N	P/N	P/N
0.250	#8	0.250	0.312	0.359	0.109	F025-F	B-1N	GN-025	CN-015
0.312	#10	0.250	0.312	0.438	0.109	F031-F	B-1N	GN-031	CN-018
0.375	1/4 - 20	0.250	0.312	0.500	0.125	F037-F	B-1N	GN-037	CN-025
0.438	5/16 - 18	0.312	0.350	0.578	0.141	F043-F	B-1N	GN-043	CN-031
0.500	3/8 - 16	0.375	0.375	0.688	0.156	F050-F	B-1N	GN-050	CN-037
0.625	1/2 - 13	0.500	0.500	0.797	0.188	F062-F	B-2N	GN-062	CN-050
0.750	5/8 - 11	0.562	0.625	0.938	0.250	F075-F	B-2N	GN-075	CN-062
0.875	3/4 - 10	0.625	0.625	1.094	0.313	F087-F	B-3N	GN-087	CN-075
1.000	7-8 - 9	0.750	0.720	1.250	0.375	F100-F	B-3N	GN-100	CN-087

* Chuck part number provided is for the Threaded Diameter (C) shown.

To order or specify give: Stud Code, Base diameter, Length, Thread Size, Thread Length, Material and Quantity

Example: TS, .500 x 1.00, 3/8-16 x 5/8, (BW), 304 SS, 2200 pcs.

Specify (L) Length on a Before Weld basis by indicating "BW" or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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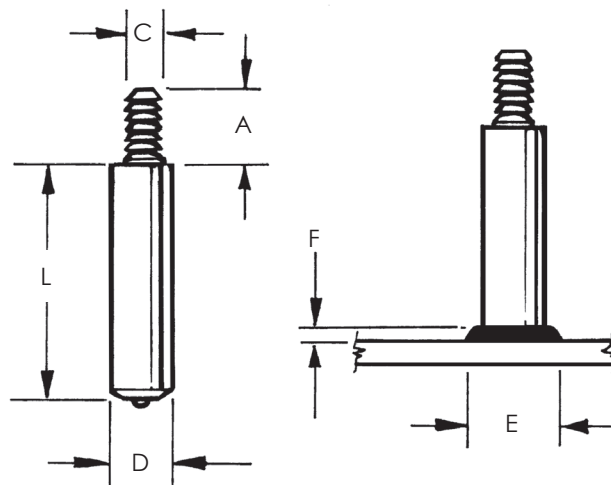
ARC Weld Studs - Externally Threaded

TAG - SHOULDER ANNULAR GROOVE WELD STUDS - TECHNICAL DETAILS

Complete Stud Welding TAG weld studs are available in mild steel and stainless steel materials.

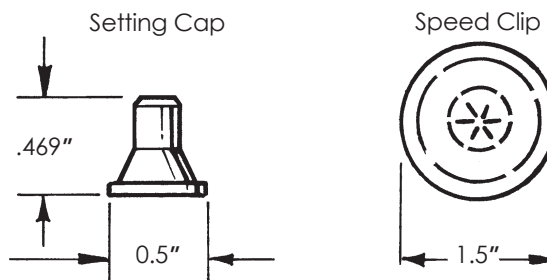
TAG studs are used to make roof or wall systems and to cover and insulate tanks. The speed clip is commonly used to secure insulation material impaled over the stud prior to capping. After the sheet metal skin is impaled over the annular grooves, the cap-setting tool and a hammer are used to install the setting caps onto the TAG studs.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories			
Base Diameter	Groove Diameter	Groove Length	Min. Length	Flash Dimensions					
D	C	A	L	E	F	Ferrule	Foot	Grip	Chuck
0.312	0.188	0.375	0.625	0.438	0.109	F031-F	B-IN	GN-03I	CN-018
0.312	0.188	0.438	0.625	0.438	0.109	F031-F	B-IN	GN-03I	CN-018

Recommended Hardware:	Part Number
Speed Clip - Mild Steel	SAG-001
Speed Clip - Stainless Steel	SAG-002
Speed Clip - Aluminum	SAG-003
Setting Caps - Aluminum	SAG-004
Setting Tool	SAG-005



To order or specify give: Stud Code, Dimensions D x L: A, Material and Quantity

Example: TAG .312 x 7/8, .437, (BW), Mild Steel, 4000 pcs.

Specify (L) Length on a Before Weld basis by indicating "BW"

or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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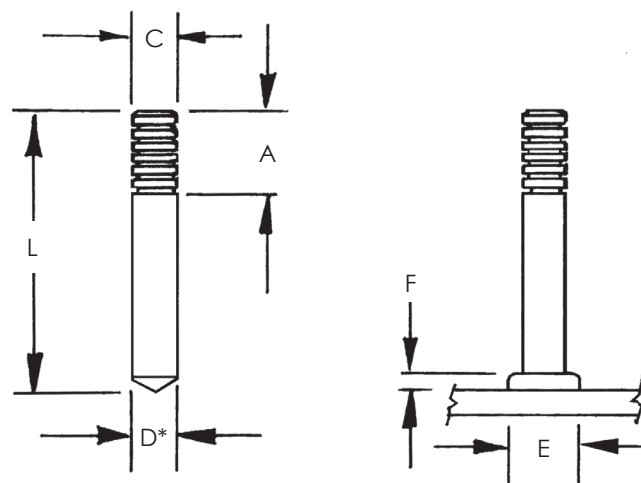
ARC Weld Studs - Externally Threaded

TAR – ANNULAR RING (NAVY) WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding TAR weld studs are available in mild steel and stainless steel materials.

TAR studs are used to install insulation materials. After the stud is welded in place, the insulation is impaled over the stud and then the mushroom navy cap is installed onto the stud with a hammer. The cap is now locked onto the stud.

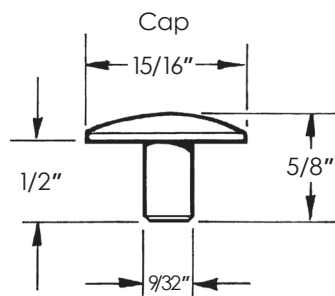
For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



*TAR Studs are fluxed as requested.

Stud Specifications						Standard Accessories			
Base Diameter	Groove Diameter	Groove Length	Min. Length	Flash Dimensions					
D	C	A	L	E	F	Ferrule	Foot	Grip	Chuck
0.188	0.175	0.312	0.750	0.281	0.094	F019-F	B-IN	GN-019	CN-018

Recommended Hardware	Part Number
Mushroom Navy Cap - Aluminum	TAR-001



To order or specify give: Stud Code, Dimensions C x L, A, Material and Quantity

Example: TAR, .188 x 7/8, (BW), Stainless, 5000 pcs.

Specify (L) Length on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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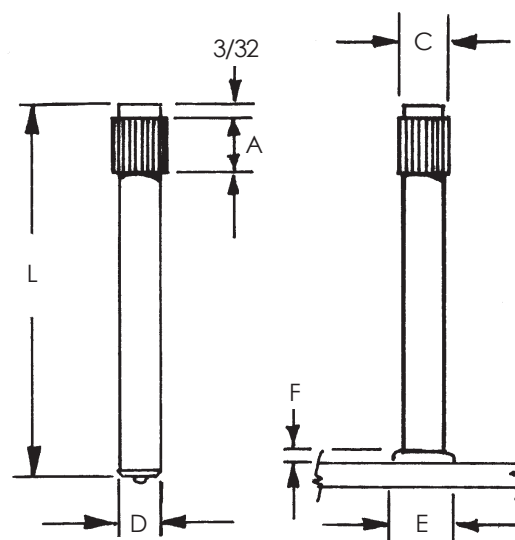
ARC Weld Studs - Externally Threaded

TKN - KNURLED WELD STUDS - TECHNICAL DETAILS

Complete Stud Welding TKN weld studs are available in mild steel and stainless steel materials.

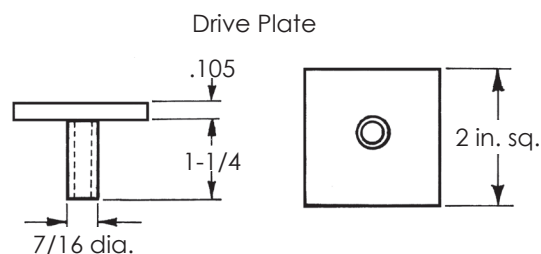
TKN studs are used to install insulation materials. After the stud is welded in place, the insulation is impaled over the stud and then the drive plate is installed onto the stud with a hammer. The drive plate is now locked onto the stud.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories			
Base Diameter	Knurled Diameter	Groove Length	Min. Length	Flash Dimensions					
D	C	A	L	E	F	Ferrule	Foot	Grip	Chuck
0.312	0.327	0.375	0.875	0.438	0.109	F031-F	B-IN	GN-03I	CN-03I

Recommended Hardware	Part Number
Drive Plate - Mild Steel	TKN-001
Drive Plate - Stainless Steel	TKN-002



To order or specify give: Stud Code, Dimensions D x L, Material and Quantity

Example: TKN, .312 x 1, (BW), Stainless, 5000 pcs.

**Specify (L) Length on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."**

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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ARC Weld Studs - Internally Threaded

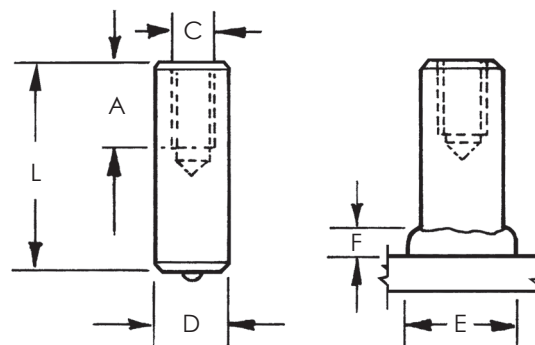
TI - THREADED INTERNALLY WELD STUDS -TECHNICAL DETAILS

Complete Stud Welding TI weld studs are available in mild steel and stainless steel materials. As the majority of TI studs are made to each customer's order, the customer can specify all dimensions.

Coarse and fine threads are available in both imperial (UNC-2B and UNF-2B) and ISO metric (Class 6g) sizes. The imperial coarse threads are depicted below (UNC-2B).

TI studs are used to secure components to larger structures and or as a standoff.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories			
Base Diameter	Max. Thread Tap	Max Std. Thread Depth	Minimum Length*	Flash Dimensions		Ferrule	Foot	Grip	Chuck
D	C	A	L	E	F	P/N	P/N	P/N	P/N
0.250	#8	0.250	0.500	0.359	0.109	F025-F	B-1N	GN-025	CN-025
0.312	#10	0.281	0.577	0.438	0.109	F031-F	B-1N	GN-031	CN-031
0.375	1/4 - 20	0.375	0.718	0.500	0.125	F037-F	B-1N	GN-037	CN-037
0.438	5/16 - 18	0.468	0.858	0.578	0.141	F043-F	B-1N	GN-043	CN-043
0.500	3/8 - 16	0.562	0.983	0.688	0.156	F050-F	B-1N	GN-050	CN-050
0.625	1/2 - 13	0.750	1.287	0.797	0.188	F062-F	B-2N	GN-062	CN-062
0.750	5/8 - 11	0.937	1.593	0.938	0.250	F075-F	B-2N	GN-075	CN-075
0.875	3/4 - 10	1.125	1.859	1.094	0.313	F087-F	B-3N	GN-087	CN-087
1.000	7/8-9	1.312	2.125	1.250	0.375	F100-F	B-3N	GN-100	CN-100

Note, the minimum length (L) is reduced when smaller thread sizes are used compared to what is shown.

To order or specify give: Stud Code, Dimensions D x L, C x A, Material and Quantity

Example: TI, .50 x 1, with 3/8-16 x .562, (BW), Mild Steel, 1000 pcs.

Specify (L) Length on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **TARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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Arc Weld Studs - Internally Threaded

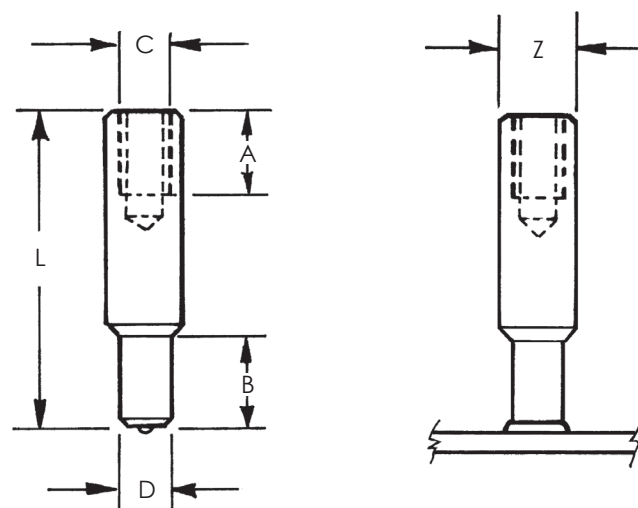
TIR - THREADED INTERNALLY REDUCED BASE WELD STUDS - TECHNICAL DETAILS

Complete Stud Welding TIR weld studs are available in mild steel and stainless steel materials. As the majority of TIR studs are made to each customer's order, the customer can specify all dimensions.

Coarse and fine threads are available in both imperial (UNC-2B and UNF-2B) and ISO metric (Class 6g) sizes. The imperial coarse threads are depicted below (UNC-2B).

TIR studs are used to secure components to larger structures and or as a standoff. The reduced weld base diameter may satisfy application needs and or equipment limitations.

For application, dimensional and in stock assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications							Standard Accessories		
Major Diameter	Max. Thread Tap	Min. Thread Depth	Minimum Length*	Base Diameter	Base Length	Ferrule	Foot	Grip	Chuck
Z	C	A	L	D	B	P/N	P/N	P/N	P/N
0.375	1/4 - 20	0.250	0.828	0.250	0.375	F025-LP	B-1N	GN-025	CN-037
0.500	3/8 - 16	0.375	1.015	0.375	0.375	F037-LP	B-1N	GN-037	CN-050
0.625	1/2-13	0.375	1.250	0.500	0.547	F050-LP	B-1N	GN-050	CN-062
0.750	1/2-13	0.375	1.250	0.500	0.547	F050-LP	B-1N	GN-050	CN-075
0.875	5/8-11	0.500	1.703	0.625	0.797	F062-LP	B-2N	GN-062	CN-087
1.000	3/4-10	0.500	1.875	0.750	0.922	F075-LP	B-2N	GN-075	CN-100

Note, the minimum length (L) is reduced when smaller thread sizes are used compared to what is shown.

To order or specify give: Stud Code, Dimensions Z x L, C x A, D x B, Material and Quantity

Example: TIR, .50 x 1.25 with 3/8-16 x .562, RB .375 x .375, (BW), Mild Steel, 1200 pcs.

**Specify (L) Length on a Before Weld basis by indicating "BW"
or on an After Weld basis by indicating "AW."**

See **Accessories** for accessory detail and **Ferrule Specifications** for ferrule options.

See **ARC Stud Welding – General Information** and **Technical Details** for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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Arc Weld Studs - TUFFSTUDDS

TUFFSTUDD WEAR PROTECTION SYSTEM – PRODUCT INFORMATION

Tuffstudd Wear Protection System is a proven product in protecting equipment exposed to high wear and abrasion. The Tuffstudd System has had excellent results protecting mining, construction and aggregate equipment over other methods of wear protection.

Some other methods of wear protection are hard facing, AR plate, Hardox plate, weld buttons and shrouds. The Tuffstudd System has been used in conjunction with and as an alternative to these other methods.

PRODUCT FEATURES:

Dead Bed Effect - Tuffstudds are applied in a staggered pattern that captures material between the studs resulting in material wearing on material versus material wearing on the equipment. Tuffstudds have a height profile ranging from 3/8" to 5/8".

Equipment Life - The split second time to weld a Tuffstudd minimizes the heat input to the base metal (i.e. Your equipment) thereby reducing stress, distortion and warping.

Tuffstudds have a hardness of 50 to 60 Rc. Tuffstudds increase service life up to 3 times longer than non-studded surfaces, reducing equipment downtime and component replacement costs.

Fast Installation - An achievable welding rate of 200 Tuffstudds per hour correlates to coverage area of 1.43 to 2.86 square feet per hour and the deposition of 7.4 to 18 pounds per hour.

Replacement - Repair and re-stud previously studded surfaces.

Safety - Compared to other welding processes, stud welding is virtually smokeless and the arc flash is much shorter and partially covered.

REALIZABLE BENEFITS:

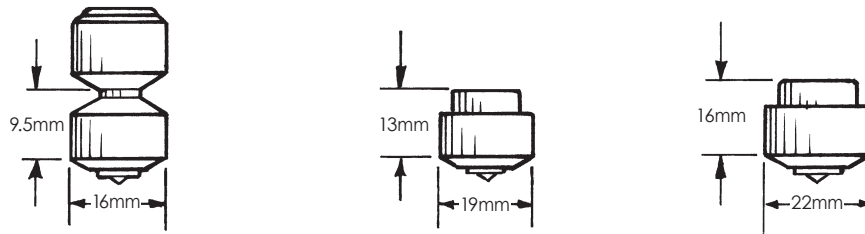
Increased life of material handling and processing equipment.
Reduced wear protection installation costs.
Reduced equipment maintenance costs.
Reduced equipment downtime.

SOME PROVEN TUFFSTUDD APPLICATIONS INCLUDE:

Dragline buckets & Dippers
Shovel and Loader Buckets
Dozer Blades
Gyratory Crushers
Roll Crushers
Discharge Chutes
Augers

Arc Weld Studs - TUFFSTUDDS

TS – TUFFSTUDDS WEAR PROTECTION WELD STUDS – TECHNICAL DETAILS



Product Detail	Series 58*	Series 68	Series 78
Alloy Selection:	* Low profile knock-off design		
A-Series Alloy	Medium-high carbon chromium carbide in iron-molybdenum alloy matrix		
Part number	TSA-58	TSA-68	TSA-78
Hardness (Rc)	48 - 52		
Recommended use	Very good abrasion and excellent impact resistance.		
I-Series Alloy	Medium-high carbon chromium carbide in iron-molybdenum alloy matrix		
Part number	TSI-58	TSI-68	TSI-78
Hardness (Rc)	55 - 60		
Recommended use	Excellent abrasion resistance and good impact resistance		
Stud Dimensions:			
Diameter	5/8"	3/4"	7/8"
Length before weld	1/2"	5/8"	3/4"
Length after weld	3/8"	1/2"	5/8"
Packaging & Coverage:			
Studs Per box	500	250	250
Studs Per square foot	140	100	70
Square feet per box	3.5	2.5	3.5
Installation rates:			
Studs per hour	200	200	200
Square feet per hour	1.4	2.0	2.9
Pounds per hour	7.4	12.4	18.0
Pounds per square foot	5.2	6.2	6.3
Best Use:	Leading edges & overhead position	Behind leading edge rows & in large areas	
Welding Detail:			
Amperage	800 - 1000	1000 - 1100	1200 - 1400
Weld Time (seconds)	0.60 - 0.70	0.70 - 0.85	0.85 - 1.00
Weld Position	Down hand, Side hand & Overhead	Down hand & Side Hand	Down hand
Preheat	Not required. Minimal to remove condensation during cold weather.		
Chuck	CN-062	CN-050	CN-062
Ferrule Grip	GDN-062	GN-075	GN-087
Foot	B-2N	B-2N	B-3N

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SECTION 4

CD WELD STUDS GENERAL INFORMATION & TECHNICAL DETAILS

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

OFFICE: 216.904.4008

EMAIL: SALES@COMPLETESTUDWELD.COM

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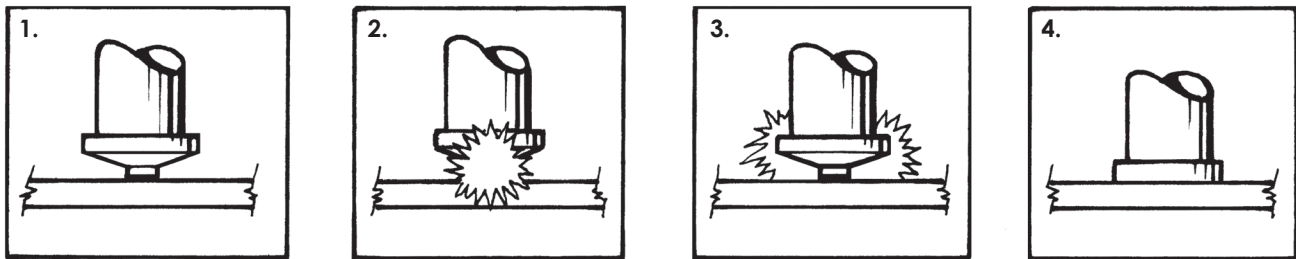
CD Weld Studs

General Information & Technical Details

CAPACITOR DISCHARGE (CD) STUD WELDING PROCESS DESCRIPTION

Process Description:

Capacitor Discharge (CD) Stud Welding involves the same basic principles and metallurgical aspects as any other arc welding procedure. When the weld gun is activated, a special precision weld tip initiates a controlled electric arc from the welder capacitor bank which melts the end of the stud and a portion of the base metal. The stud is held in place as the molten metal solidifies instantly accomplishing a high quality fusion weld.



1. The weld gun and stud are positioned against the work.
2. Stored energy is discharged through special weld "timing" tip and stud starts downward.
3. The stud is forced into the pool of molten metal.
4. Metal solidifies and weld is completed in milliseconds.

Process Advantages:

Base & Stud Material Compatibility - CD Stud Welding is compatible with just about any weldable material, and permits the welding of dissimilar metals. See Chart on the next page for further details.

Reverse-Side Marking - CD Stud Welding is generally used to weld smaller diameter studs to thin base metals, especially where reverse side marking is not permissible. Since the entire weld cycle is completed in milliseconds, welds can be made to thin material without pronounced distortion, burn-through, or reverse side discoloration. See CD Stud Reverse-Side Marking Guide.

CD Weld Studs

General Information & Technical Details

COMPATIBILITY OF BASE METAL & CD STUD MATERIAL COMBINATIONS

BASE WELD MATERIAL	STUD MATERIAL			
	MILD STEEL	STAINLESS	ALUMINUM	BRASS
	1008, 1010, 1015, 1018	302, 304, 305	1100, 5086, 6063	70-30, 65-35
MILD STEEL: 1006 through 1030	Excellent	Excellent	—	Excellent
MEDIUM CARBON STEEL: 1030 through 1050	Good *	Good *	—	Good *
GALVANIZED SHEET DUCT OR DECKING	Excellent	Excellent	—	—
STRUCTURAL STEEL:	Excellent	Excellent	—	Excellent
STAINLESS STEEL: 405, 410, 430, AND 300 SERIES, EXCEPT 303	Excellent	Excellent	—	Excellent
LEAD FREE BRASS; ELECTROLYTIC COPPER; ROLLED COPPER	Excellent	Excellent	—	Excellent
MOST ALUMINUM ALLOYS OF THE 1100, 3000, 5000, AND 6000 SERIES **	der	—	Excellent	—
ZINC ALLOYS (die cast)	Good *	Good *	Excellent	Good *

* Good: Generally Full Strength results, depending upon the combination of stud size and base metal.

** Other materials such as 7000 Series Aluminum, titanium alloys, Inconel, etc. can be welded under specified conditions.

CD Weld Studs

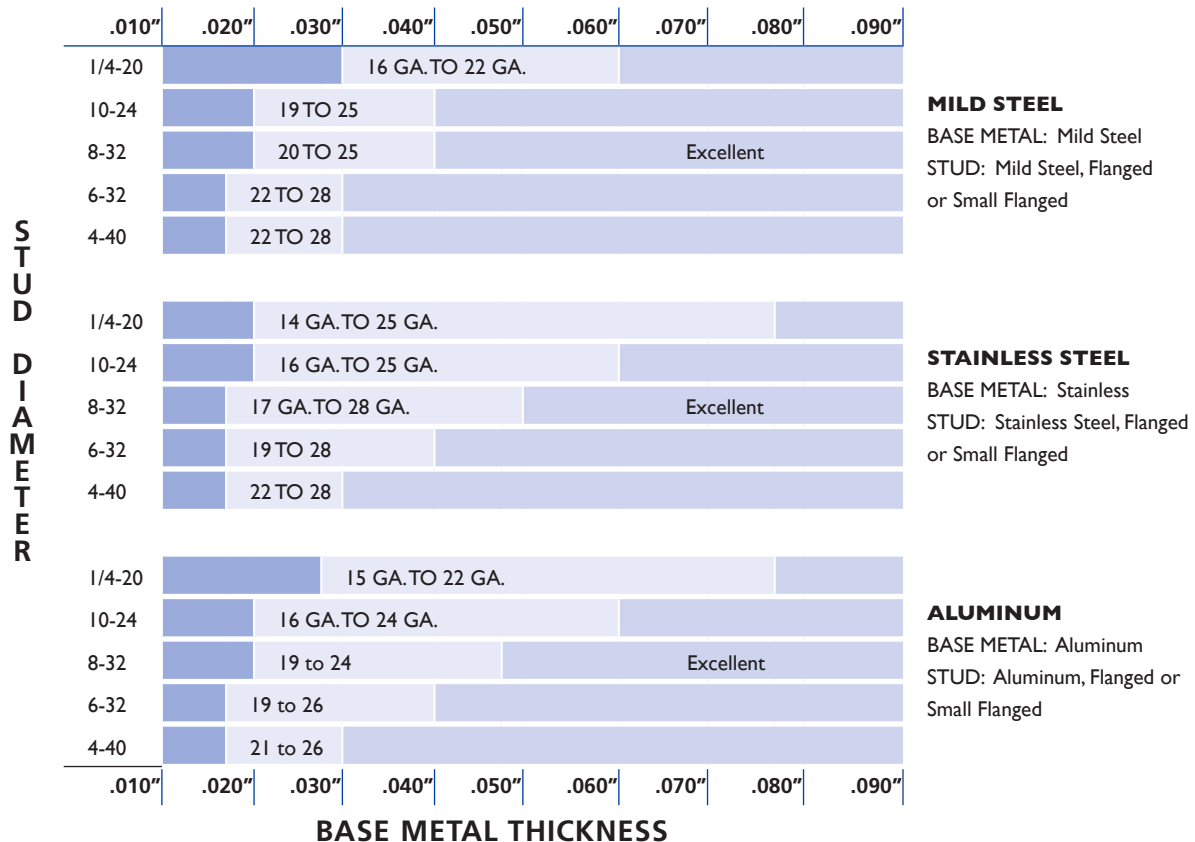
General Information & Technical Details

CD STUD REVERSE-SIDE MARKING GUIDE

The charts below will be of help in determining the best combination of stud weld base size and base metal thickness. The terms on the charts are defined as follows:

UNACCEPTABLE	Unacceptable Marking, Base Metal Failure.
ACCEPTABLE	Visible Marking(s), Excellent Weld.
EXCELLENT	No Marking, Excellent Weld.

Additional factors that can influence the degree of reverse-side marking are tip size, weld voltage, spring pressure and the CD process used (i.e. Contact versus Gap).



CD Weld Studs

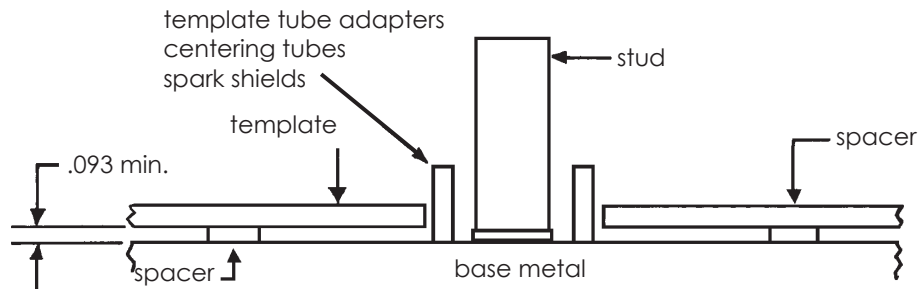
General Information & Technical Details

CD WELD STUD LOCATING OPTIONS

Template Method:

This method of templating is recommended by **Complete Stud Welding** for use with gun attachments called "Template Tube Adaptors," "Centering Tubes" and "Spark Shields."

These attachments are installed directly onto the gun or used indirectly with a CD foot. These attachments have diameters of 1", 1.25", 1.375" and 30mm. Contact your sales representative for details.



Options	Gun Mount	Foot
Template Tube Adaptor - 1" Dia.	039-839	—
Template Tube Adaptor - 1-1/4" Dia.	039-840	—
Center Tubes - 30mm Dia.	80-40-513	—
Spark Shield - Phenolic 1.156" Dia.	033-769L	028-833
Spark Shield - Brass 1.156" Dia.	033-769B	028-833

Scribe Method:

The operator can scribe a mark in the base metal at the location for the stud to be welded. The scribe mark can either be the center point or can be a circle. With the later, the weld base diameter of the stud would fit within the circle.

EXAMPLES: **X** -Locate stud in center of the X.
○ -Locate stud in center of the circle.

Center Punch Method: Not Recommended

When the CD Stud Welding Process is being used, the special weld tip on the end of all CD Type studs should not be used with center punch marks as a method of locating CD Type studs.

The diameter and length of the special weld tip controls the time duration of the CD Stud Welding Process and is absolutely critical in obtaining welds that develop full fastener strength. Accordingly, the introduction of a center punch mark interferes with the timing of the CD Stud Welding process and will result in weld failures.

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CD Weld Studs

General Information & Technical Details

CD WELD STUDS – TECHNICAL DETAILS

Threaded & No Thread CD Weld Studs: Complete Stud Welding has various sizes of externally and internally threaded weld studs and various shapes and size of no thread weld studs. These weld studs are used in various construction, automotive and industrial applications.

Threads: The chart below depicts the thread standards for imperial and metric external and internal threads. Unless requested or quoted otherwise, threads will be quoted based on these common thread standards.

Unless indicated or quoted otherwise, external threads will be a rolled type thread. The strength and surface finish of rolled threads are considered to be superior to cut type threads.

	External Threads	Internal Threads
Imperial Threads - Coarse	UNC-2A	UNC-2B
Imperial Threads - Fine	UNF-2A	UNF-2B
Metric Threads	Class 6g	Class 6H

Auto Feed Quality: All CD weld studs are available in auto feed quality. This allows for usage in auto feed stud welding systems. Auto feed hand guns and weld heads are available with the power source(s) and feeding equipment for incorporation into automated CNC and robotic systems. Auto feed quality should be requested at the time of quotation.

Material: The chart below depicts the common material types with corresponding typical tensile strengths used to produce CD Weld Studs.

Material Type(s)	Typical Tensile Strength	
	Ultimate (psi)	Yield (psi)
Mild Steel C1006 -C1018 range	55,000	35,000
Stainless Steel 18-8 (302HQ & 304)	75,000	30,000
Aluminum Alloy 5356 & 5154	40,000	29,000
Aluminum Alloy 1100	21,000	20,000
Copper Alloy (Brass) CDA 260 & CDA 268	50,000	30,000

Note, all external threaded mild steel CD studs are copper flashed / plated.

CD Weld Studs

General Information & Technical Details

CD WELD STUDS – TECHNICAL DETAILS

Plating: For mild steel studs, copper plating is standard for externally threaded studs. Upon request Nickel, Zinc and other plating's are available.

Annealing: All low carbon steel and stainless steel studs are annealed where required.

Weld Base: CD Studs are available in the Flanged, Small-Flanged and Non-Flanged condition.

Length Reduction: CD Studs have no appreciable length reduction after welding.

Shielding: The CD Process does not utilize ferrules or arc shields as with the ARC Stud Welding Process.

Generally shielding gas is not required.

Welding Position: CD Studs can easily be welded in the down hand, side hand and overhead positions.

Other: For further details please see the following sections:

- CD Stud Welding Guidelines

- CD Stud Weld Inspection - Visual

- CD Stud Weld Inspection - Mechanical (torque values)

- CD Weld Stud Weight Charts

- CD Weld Studs - Standard Stock Sizes

CD Weld Studs

General Information & Technical Details

CD STUD WELDING GUIDELINES

The following guidelines should be followed for producing and maintaining good CD Stud Welds:

- Ensure the stud welding equipment is capable of welding the stud size intended to be welded.
- Ensure the Stud Welding Equipment is in proper working order and that all cable and ground connections are tight.
- Weld surface cleanliness. The surface should be free from excessive oils, grease and other lubricants and from rust, mill scale, and other oxides. These conditions contribute to high electrical resistance in areas of welding and grounding.
- Weld surface imperfections, such as extreme roughness, which can prevent complete fusion in the weld area and or interfere with the time duration of the process, should be avoided.
- The stud axis must be perpendicular to the work surface to obtain complete fusion.
- Proper weld end design of the stud is necessary. The tip size, weld base diameter and face angle must be correct for the application.
- The operator should follow the equipment manufacturer's setup parameters (i.e.. Weld voltage, Spring pressure, Plunge and when using GAP or Drawn Arc Method, Lift).
- Visually inspect all welds for 360 degree weld flash. See next page for illustrations of Good, Cold and Hot welds. If a questionable weld is evident after the welds have been visually inspected, the weld should be mechanically tested.
- Mechanically test 2 welded studs at the start of each shift and change in stud size.
- Mechanical Testing of CD stud welds should be done by bend testing or torque testing. The tests are used to establish welding conditions and qualify production studs. The stud and or weld may be tensile tested and or submitted to other forms of destructive or non-destructive testing as the application requires.
- The bend test should be performed by bending the stud 30 degrees by striking with a hammer or, preferably, bending with a pipe.
- Torque values are given in the subsequent table for various stud materials and stud diameters.

CD Weld Studs

General Information & Technical Details

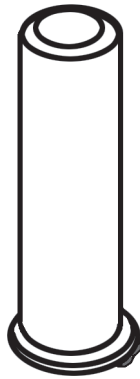
CD STUD WELD INSPECTION – VISUAL

The CD stud weld can be visually inspected by observing the weld flash at the base of the stud. The illustrations and comments below are intended to assist in visually judging the quality of the weld. For assistance, contact your **Complete Stud Welding** Sales Representative.



Good Weld

Full, even, shiny weld flash all around stud.



Cold Weld

No or uneven weld flash around weld stud.



Hot Weld

Large crater, excessive metal expulsion with shiny appearance.

CD Weld Studs

General Information & Technical Details

CD STUD WELD INSPECTION – MECHANICAL – TENSILE / TORQUE STRENGTHS

The following 3 pages of charts contain CD weld stud - Tensile / Torque Strengths.
The data was calculated based on the formulas shown below. These formulas and the notes below are considered integral parts of the Tensile/Torque Strength charts that follow.

Tensile Load	$L = SA$
Torque	$T = 0.2 \times D \times L$
META*	$A = \pi/4 \times [D - (0.9743/N)]$

A = Mean Effective Thread Area (META)*	D = Nominal Thread Diameter
L = Tensile Load Pounds	N = Threads Per Inch
S = Tensile Stress in PSI	T = Torque in Inch Pounds

* META is used instead of root area in calculating screw strengths because of closer correlation with actual tensile strength. META is based on mean diameter, which is diameter of an imaginary coaxial cylinder whose surface would pass through the thread profile approximately midway between the minor and pitch diameters.

** Please note, in actual practice a stud should not be used at its yield load. A factor of safety must be applied. It is generally recommended that studs be used at no more than 60% of yield. However the factor of safety may vary up or down, depending on the application. **The user will determine the appropriate safety factor.**

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

Shear values were calculated at 75% of the Ultimate Tensile Load of the stud.

See next 3 pages for charts on Tensile and Torque Strengths

**** & *** Applies to subsequent Tensile / Torque Strength Charts.**

CD Weld Studs

General Information & Technical Details

CD STUD WELD INSPECTION – MECHANICAL – TENSILE / TORQUE STRENGTHS

Low Carbon Steel - 55,000 PSI Min. Tensile, 35,000 PSI Min. Yield					
Thread Size	Yield Load (Lbs.)**	Ultimate Tensile Load (Lbs.)	Yield Torque (inch lbs.)***	Ultimate Torque (inch lbs.)***	Shear Strength (75% of Tensile Load)
4-40	211	332	5	7	249
6-32	318	500	9	14	375
8-32	490	770	16	25	578
10-24	614	964	23	37	723
10-32	700	1,100	27	42	825
1/4-20	1,120	1,760	56	88	1,320
5/16-18	1,820	2,860	114	179	2,145
3/8-16	2,695	4,235	202	318	3,176
M3 - .50	269	423	6	10	317
M4 - .70	469	737	15	23	553
M5 - .80	759	1,192	30	47	894
M6 - 1.00	1,085	1,705	51	81	1,279
M8 - 1.25	1,960	3,080	123	194	2,310
M10 - 1.50	3,106	4,881	245	384	3,661

Stainless Steel - 75,000 PSI Min. Tensile, 30,000 PSI Min. Yield					
Thread Size	Yield Load (Lbs.)**	Ultimate Tensile Load (Lbs.)	Yield Torque (inch lbs.)***	Ultimate Torque (inch lbs.)***	Shear Strength (75% of Tensile Load)
4-40	181	452	4	10	339
6-32	273	682	8	19	511
8-32	420	1,050	14	34	788
10-24	526	1,315	20	50	986
10-32	600	1,500	23	57	1,125
1/4-20	954	2,385	48	119	1,789
5/16-18	1,560	3,900	97	244	2,925
3/8-16	2,325	5,813	174	436	4,359
M3 - .50	230	576	5	14	432
M4 - .70	402	1,005	13	32	754
M5 - .80	650	1,626	26	64	1,220
M6 - 1.00	930	2,325	44	110	1,744
M8 - 1.25	1,680	4,200	106	265	3,150
M10 - 1.50	2,663	6,656	210	524	4,992

** & *** For footnote details see first page of CD Stud Weld Inspection - Mechanical

COMPLETE
STUD WELDING
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CD Weld Studs

General Information & Technical Details

CD STUD WELD INSPECTION – MECHANICAL – TENSILE / TORQUE STRENGTHS

Standard CD Weld Studs - Tensile / Torque Strengths					
Aluminum 5356 / 5154 - 40,000 PSI Min. Tensile, 29,000 PSI Min. Yield					
Thread Size	Yield Load (Lbs.)**	Ultimate Tensile Load (Lbs.)	Yield Torque (inch lbs.)***	Ultimate Torque (inch lbs.)***	Shear Strength (75% of Tensile Load)
4-40	175	241	4	5	181
6-32	264	363	7	10	273
8-32	406	560	13	18	420
10-24	508	701	19	27	526
10-32	580	800	22	30	600
1/4-20	928	1,280	46	64	960
5/16-18	1,508	2,080	94	130	1,560
3/8-16	2,233	3,080	167	231	2,310
M3 - .50	223	307	5	7	230
M4 - .70	389	536	12	17	402
M5 - .80	629	867	25	34	650
M6 - 1.00	899	1,240	42	59	930
M8 - 1.25	1,624	2,240	102	141	1,680
M10 - 1.50	2,574	3,550	203	280	2,663

Aluminum 1100 - 21,000 PSI Min. Tensile, 20,000 PSI Min. Yield					
Thread Size	Yield Load (Lbs.)**	Ultimate Tensile Load (Lbs.)	Yield Torque (inch lbs.)***	Ultimate Torque (inch lbs.)***	Shear Strength (75% of Tensile Load)
4-40	121	127	3	3	95
6-32	182	191	5	5	143
8-32	280	294	9	10	221
10-24	351	368	13	14	276
10-32	400	420	15	16	315
1/4-20	636	668	32	33	501
5/16-18	1,040	1,092	65	68	819
3/8-16	1,550	1,628	116	122	1,221
M3 - .50	154	161	4	4	121
M4 - .70	268	281	8	9	211
M5 - .80	434	455	17	18	341
M6 - 1.00	620	651	29	31	488
M8 - 1.25	1,120	1,176	71	74	882
M10 - 1.50	1,775	1,864	140	147	1,398

** & *** For footnote details see first page of CD Stud Weld Inspection - Mechanical

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STUD WELDING
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CD Weld Studs

General Information & Technical Details

CD STUD WELD INSPECTION – MECHANICAL – TENSILE / TORQUE STRENGTHS

Standard CD Weld Studs - Tensile / Torque Strengths					
Brass - 50,000 PSI Min. Tensile, 30,000 PSI Min. Yield					
Thread Size	Yield Load (Lbs.)**	Ultimate Tensile Load (Lbs.)	Yield Torque (inch lbs.)***	Ultimate Torque (inch lbs.)***	Shear Strength (75% of Tensile Load)
4-40	181	302	4	7	226
6-32	273	454	8	13	341
8-32	420	700	14	23	525
10-24	526	877	20	33	657
10-32	600	1,000	23	38	750
1/4-20	960	1,600	48	80	1,200
5/16-18	1,560	2,600	98	163	1,950
3/8-16	2,310	3,850	173	289	2,888
M3 - .50	230	384	5	9	288
M4 - .70	402	670	13	21	503
M5 - .80	650	1,084	26	43	813
M6 - 1.00	930	1,550	44	73	1,163
M8 - 1.25	1,680	2,800	106	176	2,100
M10 - 1.50	2,663	4,438	210	349	3,328

** & *** For footnote details see first page of CD Stud Weld Inspection - Mechanical

CD Weld Studs

General Information & Technical Details

WEIGHT CHARTS – CD FLANGED MILD STEEL STUDS

THREADED STUDS IN POUNDS PER 1,000 PIECES							
Length	4-40	6-32	8-32	10-24	1/4-20	5/16-18	3/8-16
1/4	0.7	1.0	1.4	1.8	3.1	—	—
3/8	0.9	1.4	1.9	2.5	4.4	7.0	9.5
1/2	1.2	1.8	2.5	3.2	5.7	9.1	12.6
5/8	1.4	2.1	3.0	3.9	7.0	11.1	15.7
3/4	1.7	2.5	3.6	4.6	8.2	13.2	18.8
7/8	1.9	2.9	4.2	5.4	9.5	15.3	21.9
1	2.2	3.3	4.7	6.1	10.8	17.4	25.8
1-1/4	2.7	4.0	5.8	7.5	13.4	21.5	31.3
1-1/2	3.2	4.8	6.9	8.9	16.0	25.7	37.5
1-3/4	3.6	5.5	8.0	10.4	18.5	29.8	43.8
2	4.1	6.3	9.2	11.8	21.1	34.0	50.0
2-1/4	4.6	7.0	10.3	13.2	23.7	38.1	56.3
2-1/2	5.1	7.8	11.4	14.6	26.3	42.3	62.5
Ea.Add. Inch	2.0	3.0	4.4	5.7	10.3	16.6	25.0

NON-THREADED STUDS IN POUNDS PER 1,000 PIECES							
Length	3/32	1/8	5/32	3/16	1/4	5/16	3/8
1/4	0.7	1.1	1.6	2.2	3.9	—	—
3/8	0.9	1.5	2.3	3.2	5.6	8.7	11.8
1/2	1.2	1.9	2.9	4.2	7.4	11.4	15.7
5/8	1.4	2.4	3.6	5.2	9.1	14.1	19.6
3/4	1.6	2.8	4.3	6.1	10.8	16.8	23.5
7/8	1.9	3.2	5.0	7.1	12.6	19.5	27.4
1	2.1	3.7	5.7	8.1	14.3	22.3	31.3
1-1/4	2.6	4.5	7.0	10.0	17.8	27.7	39.1
1-1/2	3.1	5.4	8.4	12.0	21.3	33.1	47.0
1-3/4	3.6	6.3	9.7	14.0	24.8	38.5	54.8
2	4.0	7.2	11.1	15.9	28.3	44.0	62.6
2-1/4	4.5	8.0	12.4	17.9	31.8	49.4	70.4
2-1/2	5.0	8.9	13.8	19.8	35.2	54.8	78.3
Ea.Add. Inch	1.9	3.5	5.4	7.8	13.9	21.7	30.5

CD Weld Studs

General Information & Technical Details

CD WELD STUDS- STANDARD STOCK SIZES

The attached information indicates the THREADED CD Weld Studs that are considered to be "Standard Stock Sizes." This means that 99% of the time these studs will be in stock.

The attached information does not cover the vast inventory of CD Weld Studs that are:
"Threaded CD Weld Studs NOT Considered to be "Standard Stock Sizes" that are in stock.
Non Threaded CD Weld Studs that are in stock.
Other Styles of CD Weld Studs that are in stock.

Contact your [Complete Stud Welding](#) Sales Representatives for assistance.

CD Weld Studs

General Information & Technical Details

CD WELD STUDS- STANDARD STOCK SIZES

Thread Size	Stud Length	MILD STEEL		STAINLESS STEEL		ALUMINUM	
		Flanged	Non-Flanged	Flanged	Non-Flanged	Flanged	Non-Flanged
4 - 40	X 1/4	Y	Y	Y	Y	Y	
	X 5/16			Y			
	X 3/8	Y	Y	Y	Y	Y	
	X 1/2	Y	Y	Y	Y	Y	
	X 5/8	Y	Y	Y	Y		
	X 3/4	Y	Y	Y	Y		
	X 7/8			Y			
	X 1	Y	Y	Y			
	X 1-1/4			Y			
6 - 32	X 1/4	Y	Y	Y	Y	Y	
	X 5/16			Y	Y		
	X 3/8	Y	Y	Y	Y	Y	
	X 1/2	Y	Y	Y	Y	Y	
	X 5/8	Y	Y	Y	Y	Y	
	X 3/4	Y	Y	Y	Y	Y	
	X 7/8	Y	Y	Y	Y		
	X 1	Y	Y	Y	Y	Y	
	X 1-1/4	Y	Y	Y	Y	Y	
	X 1-1/2	Y	Y	Y	Y		
8 - 32	X 1/4	Y	Y	Y	Y		
	X 5/16	Y	Y	Y	Y		
	X 3/8	Y	Y	Y	Y	Y	
	X 1/2	Y	Y	Y	Y	Y	
	X 5/8	Y	Y	Y	Y	Y	
	X 3/4	Y	Y	Y	Y	Y	
	X 7/8		Y	Y	Y		
	X 1	Y	Y	Y	Y	Y	
	X 1-1/4	Y	Y	Y	Y	Y	
	X 1-1/2	Y	Y	Y	Y		
10 - 24	X 1/4	Y	Y	Y	Y		
	X 5/16			Y	Y		
	X 3/8	Y	Y	Y	Y	Y	
	X 1/2	Y	Y	Y	Y	Y	
	X 5/8	Y	Y	Y	Y	Y	
	X 3/4	Y	Y	Y	Y	Y	
	X 7/8	Y	Y	Y			
	X 1	Y	Y	Y	Y	Y	
	X 1-1/4	Y	Y	Y	Y	Y	
	X 1-1/2	Y	Y	Y	Y	Y	

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CD Weld Studs

General Information & Technical Details

CD WELD STUDS – STANDARD STOCK SIZES . . . CONTINUED

Thread Size	Stud Length	MILD STEEL		STAINLESS STEEL		ALUMINUM	
		Flanged	Non-Flanged	Flanged	Non-Flanged	Flanged	Non-Flanged
10 - 32	X 1/4	Y	Y	Y	Y	Y	
	X 5/16			Y	Y		
	X 3/8	Y	Y	Y	Y	Y	
	X 7/16			Y			
	X 1/2	Y	Y	Y	Y	Y	
	X 5/8	Y	Y	Y	Y	Y	
	X 3/4	Y	Y	Y	Y	Y	
	X 7/8	Y	Y				
	X 1	Y	Y	Y	Y	Y	
	X 1-1/4	Y	Y	Y	Y	Y	
	X 1-1/2	Y	Y	Y	Y	Y	
	X 1-3/4	Y	Y	Y			
	X 2	Y	Y	Y	Y	Y	
1/4 - 20	X 1/4	Y		Y			
	X 3/8	Y	Y	Y	Y	Y	
	X 1/2	Y	Y	Y	Y	Y	
	X 5/8	Y	Y	Y	Y	Y	
	X 3/4	Y	Y	Y	Y	Y	
	X 7/8	Y	Y	Y	Y		
	X 1	Y	Y	Y	Y	Y	
	X 1-1/4	Y	Y	Y	Y	Y	
	X 1-3/8			Y			
	X 1-1/2	Y	Y	Y	Y	Y	
	X 1-3/4		Y	Y	Y		
	X 2	Y	Y	Y	Y	Y	
	X 2-1/4			Y			
	X 2-1/2	Y	Y	Y	Y	Y	
	X 3			Y		Y	
5/16 - 18	X 1/2	Y	Y	Y	Y		
	X 5/8			Y	Y		
	X 3/4	Y	Y	Y	Y		
	X 7/8			Y			
	X 1	Y	Y	Y	Y		
	X 1-1/4	Y	Y	Y	Y		
	X 1-1/2	Y	Y	Y	Y		
	X 1-3/4			Y			
3/8 - 16	X 2			Y			
	X 1/2	Y	Y	Y	Y		
	X 3/4	Y		Y	Y		
	X 1	Y	Y	Y	Y		
	X 1-1/4	Y	Y	Y	Y		
	X 1-1/2	Y	Y	Y	Y		
X 2		Y		Y			

CD Weld Studs

General Information & Technical Details

CD WELD STUDS – STANDARD STOCK SIZES . . . CONTINUED

Thread Size	Stud Length	MILD STEEL		STAINLESS STEEL		ALUMINUM	
		Flanged	Non-Flanged	Flanged	Non-Flanged	Flanged	Non-Flanged
M3	X 6	Y	Y	Y	Y		
	X 8	Y	Y	Y	Y		
	X 10	Y	Y	Y	Y		
	X 12	Y	Y	Y	Y		
	X 16	Y		Y	Y		
	X 20	Y		Y			
	X 25	Y		Y			
M4	X 6	Y	Y	Y			
	X 8	Y	Y	Y	Y		
	X 10	Y	Y	Y	Y		
	X 12	Y	Y	Y	Y		
	X 15	Y	Y				
	X 16	Y		Y	Y		
	X 20	Y	Y	Y	Y		
	X 25	Y	Y	Y			
	X 30	Y		Y			
	X 35	Y					
	X 40			Y			
M5	X 6						
	X 8	Y		Y			
	X 10	Y	Y	Y	Y		
	X 12	Y	Y	Y	Y		
	X 15			Y			
	X 16	Y	Y	Y	Y		
	X 20	Y	Y	Y	Y		
	X 25	Y	Y	Y	Y		
	X 30	Y		Y	Y		
	X 35	Y		Y			
	X 40	Y		Y			
	X 50	Y					
M6	X 10	Y	Y	Y	Y		
	X 12	Y		Y	Y		
	X 15	Y					
	X 16	Y	Y	Y	Y		
	X 20	Y	Y	Y	Y		
	X 25	Y	Y	Y	Y		
	X 30	Y		Y			
	X 35	Y		Y			
	X 40	Y		Y			
	X 50	Y		Y			
M8	X 12	Y		Y	Y		
	X 15	Y					
	X 16	Y	Y	Y	Y		
	X 20	Y	Y	Y	Y		
	X 25	Y	Y	Y	Y		
	X 30	Y		Y	Y		
	X 35			Y			

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SECTION 5

CD WELD STUDS

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

OFFICE: 216.904.4008

EMAIL: SALES@COMPLETESTUDWELD.COM

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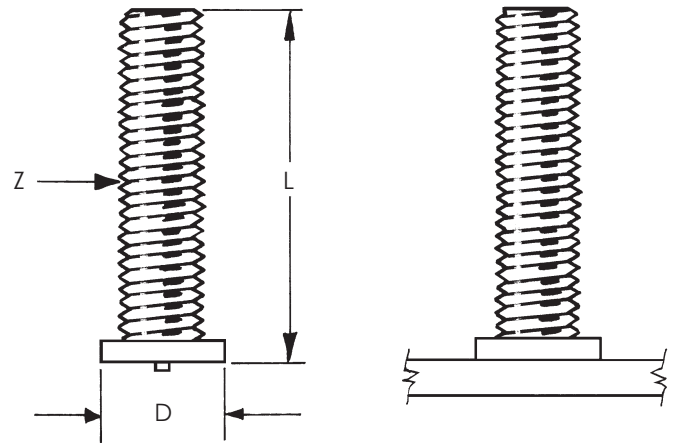
CD Weld Studs

CDF – CD THREADED FLANGED WELD STUDS – TECHNICAL DETAILS

The Capacitor Discharge (CD) Stud Welding process is designed for welding CD type studs to sheet metal with little to no reverse side marking.

The ARC- Short Cycle process is also used to weld CD type studs to sheet metal and plate.

For application, dimensional and technical assistance, please contact your [Complete Stud Welding](#) representative.



Stud Specifications				Standard Accessories				
Thread Size	Stud Diameter	Flange Diameter	Min. Length	B Collet Standard 1-3/8" Long	B Collet Short 1-3/16" Long	Long Collet 2-3/8" Long	Euro Collet 1.80" Long	Collet Inserts 1-3/4" Long
C	Z	D	L	P/N *	P/N *	P/N **	P/N	P/N ***
4-40	0.112	0.187	0.250	CDB-010	CDB-010A	CDBN-010	CDBS-010	CI-010-XXX
6-32	0.138	0.218	0.250	CDB-013	CDB-013A	CDBN-013	CDBS-013	CI-013-XXX
8-32	0.164	0.250	0.250	CDB-015	CDB-015A	CDBN-015	CDBS-015	CI-015-XXX
10-24	0.190	0.250	0.250	CDB-018	CDB-018A	CDBN-018	CDBS-018	CI-018-XXX
10-32	0.190	0.250	0.250	CDB-018	CDB-018A	CDBN-018	CDBS-018	CI-018-XXX
1/4-20	0.250	0.312	0.250	CDB-025	CDB-025A	CDBN-025	CDBS-025	CI-025-XXX
5/16-18	0.312	0.375	0.500	CDB-031	CDB-031A	CDBN-031	CDBS-031	CI-031-XXX
3/8-16	0.375	0.437	0.500	CDB-037	CDB-037A	CDBN-037	CDBS-037	CI-037-XXX
* Note, requires B Stop, see Accessories for details								
** Note, Requires Long Style Stops, see Accessories for details								
*** Note, Collet Inserts are specific to stud length, see Accessories for details								

To order or specify give: Stud Code, C x L, Material and Quantity

Example: CDF, 10-24 x 1.00, aluminum, 5000 pcs.

See [Accessories](#) for accessory details. See [CD Stud Welding General Information](#) and [Technical Details](#) for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

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CD Weld Studs

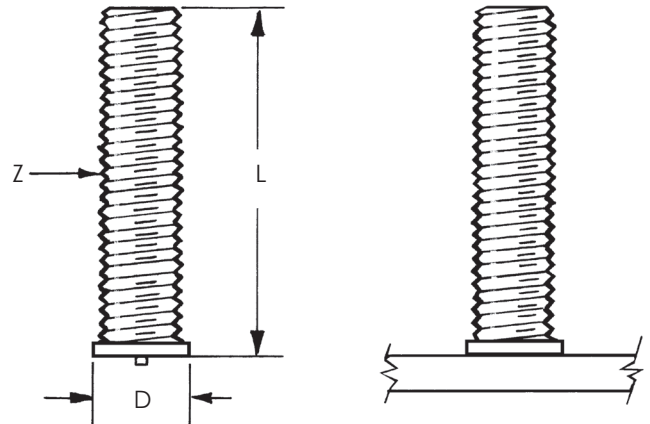
CDS – CD THREADED SMALL FLANGED WELD STUDS – TECHNICAL DETAILS

The Capacitor Discharge (CD) Stud Welding process is designed for welding CD type studs to sheet metal with little to no reverse side marking.

The ARC- Short Cycle process is also used to weld CD type studs to sheet metal and plate.

The smaller flange diameter allows for smaller diameter holes in components to be mounted on welded studs.

For assistance contact your [Complete Stud Welding](#) representative.



Stud Specifications				Standard Accessories				
Thread Size	Stud Diameter	Flange Diameter	Min. Length	B Collet Standard 1-3/8" Long	B Collet Short 1-3/16" Long	Long Collet 2-3/8" Long	Euro Collet 1.80" Long	Collet Inserts 1-3/4" Long
C	Z	D	L	P/N *	P/N *	P/N **	P/N	P/N ***
4-40	0.112	0.143	0.250	CDB-010	CDB-010A	CDBN-010	CDBS-010	CI-010-XXX
6-32	0.138	0.169	0.250	CDB-013	CDB-013A	CDBN-013	CDBS-013	CI-013-XXX
8-32	0.164	0.195	0.250	CDB-015	CDB-015A	CDBN-015	CDBS-015	CI-015-XXX
10-24	0.190	0.221	0.250	CDB-018	CDB-018A	CDBN-018	CDBS-018	CI-018-XXX
10-32	0.190	0.221	0.250	CDB-018	CDB-018A	CDBN-018	CDBS-018	CI-018-XXX
1/4-20	0.250	0.281	0.250	CDB-025	CDB-025A	CDBN-025	CDBS-025	CI-025-XXX
5/16-18	0.312	0.342	0.500	CDB-031	CDB-031A	CDBN-031	CDBS-031	CI-031-XXX
3/8-16	0.375	0.406	0.500	CDB-037	CDB-037A	CDBN-037	CDBS-037	CI-037-XXX
* Note, requires B Stop, see Accessories for details								
** Note, Requires Long Style Stops, see Accessories for details								
*** Note, Collet Inserts are specific to stud length, see Accessories for details								

To order or specify give: Stud Code, C x L, Material and Quantity

Example: CDS, 1/4-20 x 0.75, stainless steel, 5000 pcs.

See [Accessories](#) for accessory details. See [CD Stud Welding General Information](#) and [Technical Details](#) for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

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CD Weld Studs

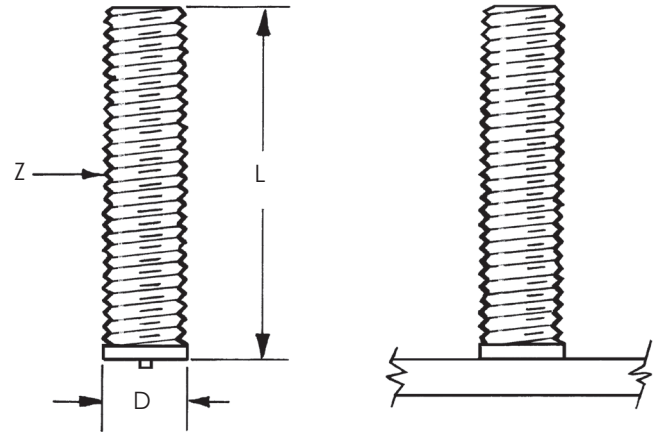
CDN – CD THREADED NON FLANGED WELD STUDS – TECHNICAL DETAILS

The Capacitor Discharge (CD) Stud Welding process is designed for welding CD type studs to sheet metal with little to no reverse side marking.

The ARC- Short Cycle process is also used to weld CD type studs to sheet metal and plate.

The smaller flange diameter allows for smaller diameter holes in components to be mounted on welded studs.

For assistance contact your [Complete Stud Welding](#) representative.



Stud Specifications				Standard Accessories				
Thread Size	Stud Diameter	Flange Diameter	Min. Length	B Collet Standard 1-3/8" Long	B Collet Short 1-3/16" Long	Long Collet 2-3/8" Long	Euro Collet 1.80" Long	Collet Inserts 1-3/4" Long
C	Z	D	L	P/N *	P/N *	P/N **	P/N	P/N ***
4-40	0.112	0.116	0.250	CDB-010	CDB-010A	CDBN-010	CDBS-010	CI-010-XXX
6-32	0.138	0.142	0.250	CDB-013	CDB-013A	CDBN-013	CDBS-013	CI-013-XXX
8-32	0.164	0.168	0.250	CDB-015	CDB-015A	CDBN-015	CDBS-015	CI-015-XXX
10-24	0.190	0.194	0.250	CDB-018	CDB-018A	CDBN-018	CDBS-018	CI-018-XXX
10-32	0.190	0.194	0.250	CDB-018	CDB-018A	CDBN-018	CDBS-018	CI-018-XXX
1/4-20	0.250	0.252	0.250	CDB-025	CDB-025A	CDBN-025	CDBS-025	CI-025-XXX
5/16-18	0.312	0.315	0.500	CDB-031	CDB-031A	CDBN-031	CDBS-031	CI-031-XXX
3/8-16	0.375	0.380	0.500	CDB-037	CDB-037A	CDBN-037	CDBS-037	CI-037-XXX
* Note, requires B Stop, see Accessories for details								
** Note, Requires Long Style Stops, see Accessories for details								
*** Note, Collet Inserts are specific to stud length, see Accessories for details								

To order or specify give: Stud Code, C x L, Material and Quantity

Example: CDN, 10-24 x 0.50, mild steel, 2500 pcs.

See [Accessories](#) for accessory details. See [CD Stud Welding General Information](#) and [Technical Details](#) for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

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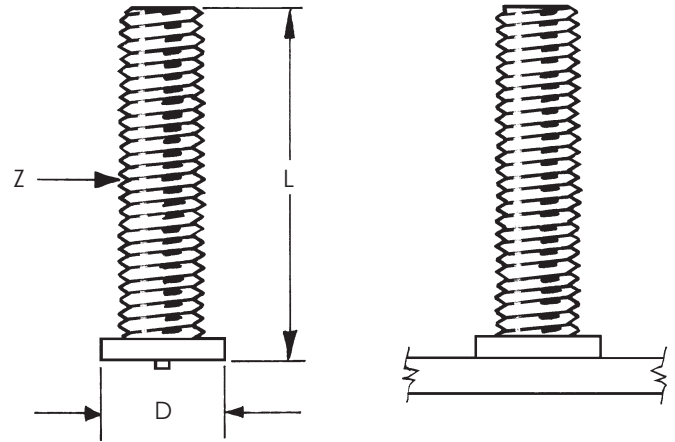
CD Weld Studs

CMF – CD METRIC FLANGED WELD STUDS – TECHNICAL DETAILS

The Capacitor Discharge (CD) Stud Welding process is designed for welding CD type studs to sheet metal with little to no reverse side marking.

The ARC- Short Cycle process is also used to weld CD type studs to sheet metal and plate.

For application, dimensional and technical assistance, please contact your [Complete Stud Welding](#) representative.



Stud Specifications				Standard Accessories		
Thread Size	Stud Diameter	Flange Diameter	Min. Length	B Collet Standard 1-3/8" Long	Long Collet 2-3/8" Long	Euro Collet 1.80 Long
C	Z	D	L	P/N *	P/N **	P/N
M3 - .50	0.118	0.197	6mm	CDB-003M	CDBN-003M	CDBS-003M
M4 - .70	0.158	0.236	6mm	CDB-004M	CDBN-004M	CDBS-004M
M5 - .80	0.197	0.276	10mm	CDB-005M	CDBN-005M	CDBS-005M
M6 - 1.00	0.236	0.315	10mm	CDB-006M	CDBN-006M	CDBS-006M
M8 - 1.25	0.315	0.413	12mm	CDB-008M	CDBN-008M	CDBS-008M
M10 - 1.50	0.394	0.465	12mm	CDB-010M	CDBN-010M	CDBS-010M
* Note, requires B Stop, see Accessories for details						
** Note, Requires Long Style Stops, see Accessories for details						

To order or specify give: Stud Code, C x L, Material and Quantity

Example: CMF, M8-1.25 X 20mm, stainless steel, 5000 pcs.

See [Accessories](#) for accessory details. See [CD Stud Welding General Information](#) and [Technical Details](#) for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

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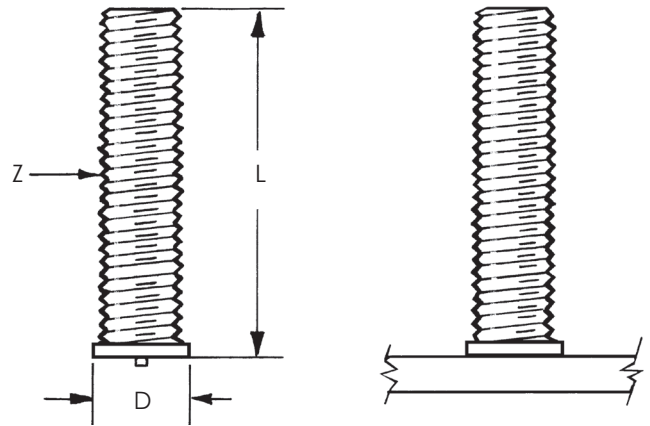
CD Weld Studs

CMS – CD METRIC SMALL FLANGED WELD STUDS – TECHNICAL DETAILS

The Capacitor Discharge (CD) Stud Welding process is designed for welding CD type studs to sheet metal with little to no reverse side marking.

The ARC- Short Cycle process is also used to weld CD type studs to sheet metal and plate.

The smaller flange diameter allows for smaller diameter holes in components to be mounted on welded studs.



Stud Specifications				Standard Accessories		
Thread Size	Stud Diameter	Flange Diameter	Min. Length	B Collet Standard 1-3/8" Long	Long Collet 2-3/8" Long	Euro Collet 1.80 Long
C	Z	D	L	P/N *	P/N **	P/N
M3 - .50	0.118	0.148	6mm	CDB-003M	CDBN-003M	CDBS-003M
M4 - .70	0.158	0.187	6mm	CDB-004M	CDBN-004M	CDBS-004M
M5 - .80	0.197	0.226	10mm	CDB-005M	CDBN-005M	CDBS-005M
M6 - 1.00	0.236	0.266	10mm	CDB-006M	CDBN-006M	CDBS-006M
M8 - 1.25	0.315	0.344	12mm	CDB-008M	CDBN-008M	CDBS-008M
M10 - 1.50	0.394	0.427	12mm	CDB-010M	CDBN-010M	CDBS-010M
* Note, requires B Stop, see Accessories for details						
** Note, Requires Long Style Stops, see Accessories for details						

To order or specify give: Stud Code, C x L, Material and Quantity

Example: CMS, M5-.80 x 25mm, mild steel, 3000 pcs.

See **Accessories** for accessory details. See **CD Stud Welding General Information** and **Technical Details** for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

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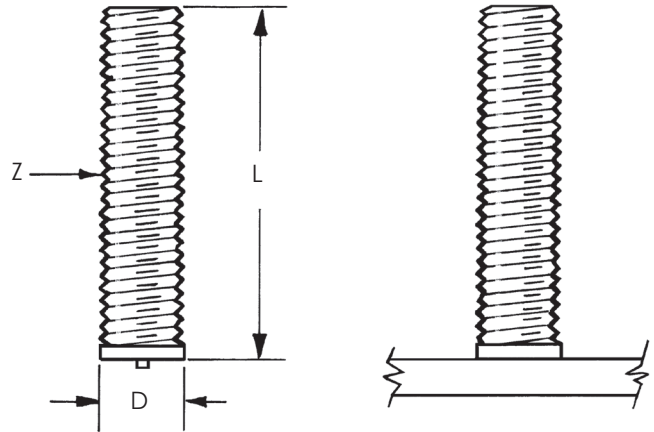
CD Weld Studs

CMN – CD METRIC NON FLANGED WELD STUDS – TECHNICAL DETAILS

The Capacitor Discharge (CD) Stud Welding process is designed for welding CD type studs to sheet metal with little to no reverse side marking.

The ARC- Short Cycle process is also used to weld CD type studs to sheet metal and plate.

The smaller flange diameter allows for smaller diameter holes in components to be mounted on welded studs.



Stud Specifications				Standard Accessories		
Thread Size	Stud Diameter	Flange Diameter	Min. Length	B Collet Standard 1-3/8" Long	Long Collet 2 -3/8" Long	Euro Collet 1.80" Long
C	Z	D	L	P/N *	P/N **	P/N
M3 - .50	0.118	0.120	6mm	CDB-003M	CDBN-003M	CDBS-003M
M4 - .70	0.158	0.160	6mm	CDB-004M	CDBN-004M	CDBS-004M
M5 - .80	0.197	0.199	10mm	CDB-005M	CDBN-005M	CDBS-005M
M6 - 1.00	0.236	0.238	10mm	CDB-006M	CDBN-006M	CDBS-006M
M8 - 1.25	0.315	0.316	12mm	CDB-008M	CDBN-008M	CDBS-008M
M10 - 1.50	0.394	0.395	12mm	CDB-010M	CDBN-010M	CDBS-010M
* Note, requires B Stop, see Accessories for details						
** Note, Requires Long Style Stops, see Accessories for details						

To order or specify give: Stud Code, C x L, Material and Quantity

Example: CMN, M6 - 1.00 x 12mm, stainless steel, 3000 pcs.

See [Accessories](#) for accessory details. See [CD Stud Welding General Information](#) and [Technical Details](#) for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

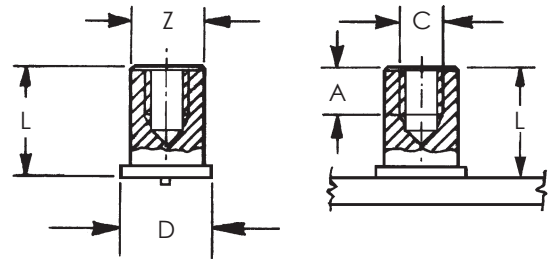
CD Weld Studs

CIT – CD INTERNALLY THREADED, FLANGED (TAPPED PADS) – TECHNICAL DETAILS

CIT flanged weld studs provide greater strength over non flanged studs when welded to thinner sheet.

For application, dimensional and technical assistance, please contact your **Complete Stud Welding** representative.

For CIT Flanged studs with imperial taps, contact your **Complete Stud Welding** representative.



Stud Specifications					Standard Accessories		
Tap Size	Tap Depth	Flange Diameter	Stud Diameter	Length Range	B Collet Standard 1-3/8" Long	Long Collet 2-3/8" Long	Euro Collet 1.80" Long
C	A	D	Z	L	P/N *	P/N **	P/N
M3 - .50	0.197	0.256	0.197	6 - 30mm	CDB-005M	CDBN-005M	CDBS-005M
M3 - .50	0.236	0.295	0.236	8 - 30mm	CDB-006M	CDBN-006M	CDBS-006M
M4 - .70	0.236	0.295	0.236	8 - 30mm	CDB-006M	CDBN-006M	CDBS-006M
M5 - .80	0.295	0.354	0.280	10 - 30mm	CA	CA	CDBS-007M
* Note, requires B Stop, see Accessories for details							
** Note, Requires Long Style Stops, see Accessories for details							
CA - Check Availability, not standard stock items							

To order or specify give: Stud Code, Z x L, C, Material and Quantity

Example: CIT, .236 x 12mm, M4, stainless, 6000 pcs.

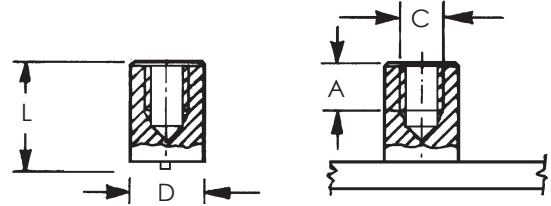
See **Accessories** for accessory details. See **CD Stud Welding General Information** and **Technical Details** for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

CD Weld Studs

CIN – CD INTERNALLY THREADED, NON FLANGED (TAPPED PADS) – TECHNICAL DETAILS

CIN non flanged weld studs are available in mild steel, stainless steel and aluminum materials. As CIN weld studs are typically made to order, metric taps and other dimensions should be specified.

For application, dimensional and technical assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications				Standard Accessories		
Tap Size	Minimum Tap Depth	Min. Stud Diameter	Min. Length	B Collet Standard 1-3/8" Long	Long Collet 2-3/8" Long	Euro Collet 1.80" Long
C	A	D	L	P/N *	P/N **	P/N
6-32	0.197	0.190	0.315	CDB-018	CDBN-018	CDBS-018
8-32	0.236	0.250	0.315	CDB-025	CDBN-025	CDBS-025
10-24	0.295	0.250	0.394	CDB-025	CDBN-025	CDBS-025
10-32	0.295	0.250	0.394	CDB-025	CDBN-025	CDBS-025
1/4-20	0.375	0.312	0.437	CDB-031	CDBN-031	CDBS-031
5/16-18	0.437	0.375	0.500	CDB-037	CDBN-037	CDBS-037
* Note, requires B Stop, see Accessories for details						
** Note, Requires Long Style Stops, see Accessories for details						
Note, Collets listed above based on Min. Stud Diameter shown above						

To order or specify give: Stud Code, C x L, D x A, Material and Quantity

Example: CIN, .250 x 1, 10-32 x .375, stainless, 1200 pcs.

See **Accessories** for accessory details. See **CD Stud Welding General Information** and **Technical Details** for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

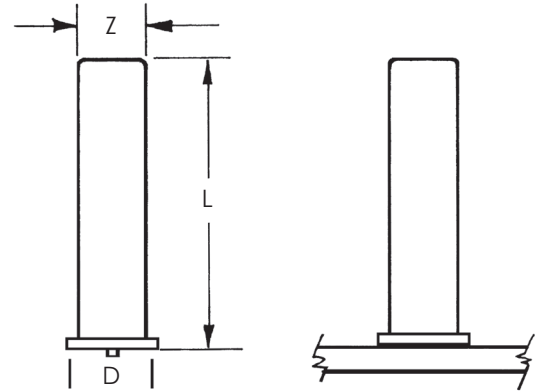
CD Weld Studs

CNF – CD NO THREAD FLANGED WELD STUDS – TECHNICAL DETAILS

The Capacitor Discharge (CD) Stud Welding process is designed for welding CD type studs to sheet metal with little to no reverse side marking.

The ARC- Short Cycle process is also used to weld CD type studs to sheet metal and plate.

For assistance contact your [Complete Stud Welding](#) representative.



Stud Specifications			Standard Accessories				
Stud Diameter	Flange Diameter	Min. Length	B Collet Standard 1-3/8" Long	B Collet Short 1-3/16" Long	Long Collet 2-3/8" Long	Euro Collet 1.80" Long	Collet Inserts 1-3/4" Long
Z	D	L	P/N *	P/N *	P/N **	P/N	P/N ***
0.094	0.174	0.250	CA	CA	CA	CA	CA
0.112	0.187	0.250	CDB-010	CDB-010A	CDBN-010	CDBS-010	CI-010-XXX
0.125	0.187	0.250	CDB-012	CDB-012A	CDBN-012	CDBS-012	CS
0.138	0.218	0.250	CDB-013	CDB-013A	CDBN-013	CDBS-013	CI-013-XXX
0.156	0.250	0.250	CDB-004M	CDB-004AM	CDBN-004M	CDBS-004M	CA
0.164	0.250	0.250	CDB-015	CDB-015A	CDBN-015	CDBS-015	CI-015-XXX
0.188	0.250	0.250	CDB-018	CDB-018A	CDBN-018	CDBS-018	CI-018-XXX
0.215	0.312	0.250	CA	CA	CA	CA	CA
0.250	0.312	0.250	CDB-025	CDB-025A	CDBN-025	CDBS-025	CI-025-XXX
0.273	0.375	0.375	CA	CA	CA	CA	CA
0.312	0.375	0.500	CDB-031	CDB-031A	CDBN-031	CDBS-031	CI-031-XXX
0.375	0.437	0.500	CDB-037	CDB-037A	CDBN-037	CDBS-037	CI-037-XXX
* Note, requires B Stop, see Accessories for details			** Note, Requires Long Style Stops, see Accessories for details				
*** Note, Collet Inserts are specific to stud length, see Accessories for details							
CA - Check Availability, not standard stock items							

To order or specify give: Stud Code, Z x L, Material and Quantity

Example: CNF, 0.312 x 0.75, stainless steel, 5000 pcs.

See [Accessories](#) for accessory details. See [CD Stud Welding General Information](#) and [Technical Details](#) for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

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CD Weld Studs

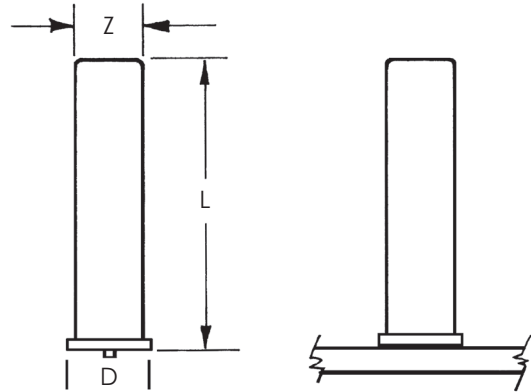
CNS - CD NO THREAD SMALL FLANGED WELD STUDS - TECHNICAL DETAILS

The Capacitor Discharge (CD) Stud Welding process is designed for welding CD type studs to sheet metal with little to no reverse side marking.

The ARC- Short Cycle process is also used to weld CD type studs to sheet metal and plate.

The smaller flange diameter allows for smaller diameter holes in components to be mounted on welded studs.

For assistance contact your [Complete Stud Welding](#) representative.



Stud Specifications			Standard Accessories				
Stud Diameter	Flange Diameter	Min. Length	B Collet Standard 1-3/8" Long	B Collet Short 1-3/16" Long	Long Collet 2-3/8" Long	Euro Collet 1.80" Long	Collet Inserts 1-3/4" Long
Z	D	L	P/N *	P/N *	P/N **	P/N	P/N ***
0.094	0.143	0.250	CA	CA	CA	CA	CA
0.112	0.156	0.250	CDB-010	CDB-010A	CDBN-010	CDBS-010	CI-010-XXX
0.125	0.156	0.250	CDB-012	CDB-012A	CDBN-012	CDBS-012	CS
0.138	0.195	0.250	CDB-013	CDB-013A	CDBN-013	CDBS-013	CI-013-XXX
0.156	0.221	0.250	CDB-004M	CDB-004AM	CDBN-004M	CDBS-004M	CA
0.164	0.221	0.250	CDB-015	CDB-015A	CDBN-015	CDBS-015	CI-015-XXX
0.188	0.221	0.250	CDB-018	CDB-018A	CDBN-018	CDBS-018	CI-018-XXX
0.215	0.281	0.250	CA	CA	CA	CA	CA
0.250	0.281	0.250	CDB-025	CDB-025A	CDBN-025	CDBS-025	CI-025-XXX
0.273	0.343	0.375	CA	CA	CA	CA	CA
0.312	0.343	0.500	CDB-031	CDB-031A	CDBN-031	CDBS-031	CI-031-XXX
0.375	0.406	0.500	CDB-037	CDB-037A	CDBN-037	CDBS-037	CI-037-XXX
* Note, requires B Stop, see Accessories for details			** Note, Requires Long Style Stops, see Accessories for details				
*** Note, Collet Inserts are specific to stud length, see Accessories for details			CA - Check Availability, not standard stock items				

To order or specify give: Stud Code, Z x L, Material and Quantity

Example: CNS, 0.25 x 0.50, mild steel, 5000 pcs.

See [Accessories](#) for accessory details. See [CD Stud Welding General Information](#) and [Technical Details](#) for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

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CD Weld Studs

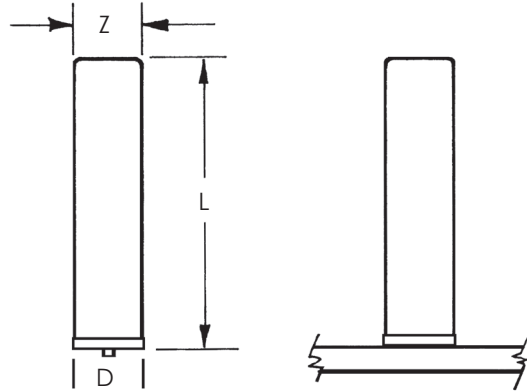
CNN – CD NO THREAD NON FLANGED WELD STUDS – TECHNICAL DETAILS

The Capacitor Discharge (CD) Stud Welding process is designed for welding CD type studs to sheet metal with little to no reverse side marking.

The ARC- Short Cycle process is also used to weld CD type studs to sheet metal and plate.

The smaller flange diameter allows for smaller diameter holes in components to be mounted on welded studs.

For assistance contact your [Complete Stud Welding](#) representative.



Stud Specifications			Standard Accessories				
Stud Diameter	Flange Diameter	Min. Length	B Collet Standard 1-3/8" Long	B Collet Short 1-3/16" Long	Long Collet 2-3/8" Long	Euro Collet 1.80 Long	Collet Inserts 1-3/4" Long
Z	D	L	P/N *	P/N *	P/N **	P/N	P/N ***
0.094	0.094	0.250	CA	CA	CA	CA	CA
0.112	0.112	0.250	CDB-010	CDB-010A	CDBN-010	CDBS-010	CI-010-XXX
0.125	0.125	0.250	CDB-012	CDB-012A	CDBN-012	CDBS-012	CS
0.138	0.138	0.250	CDB-013	CDB-013A	CDBN-013	CDBS-013	CI-013-XXX
0.156	0.156	0.250	CDB-004M	CDB-004AM	CDBN-004M	CDBS-004M	CA
0.164	0.164	0.250	CDB-015	CDB-015A	CDBN-015	CDBS-015	CI-015-XXX
0.188	0.188	0.250	CDB-018	CDB-018A	CDBN-018	CDBS-018	CI-018-XXX
0.215	0.215	0.250	CA	CA	CA	CA	CA
0.250	0.250	0.250	CDB-025	CDB-025A	CDBN-025	CDBS-025	CI-025-XXX
0.273	0.273	0.375	CA	CA	CA	CA	CA
0.312	0.312	0.500	CDB-031	CDB-031A	CDBN-031	CDBS-031	CI-031-XXX
0.375	0.375	0.500	CDB-037	CDB-037A	CDBN-037	CDBS-037	CI-037-XXX

* Note, requires B Stop, see Accessories for details

** Note, Requires Long Style Stops, see Accessories for details

*** Note, Collet Inserts are specific to stud length, see Accessories for details

CA - Check Availability, not standard stock items

To order or specify give: Stud Code, Z x L, Material and Quantity

Example: CNN, 0.156 x 0.625, mild steel, 5000 pcs.

See [Accessories](#) for accessory details. See [CD Stud Welding General Information](#) and [Technical Details](#) for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

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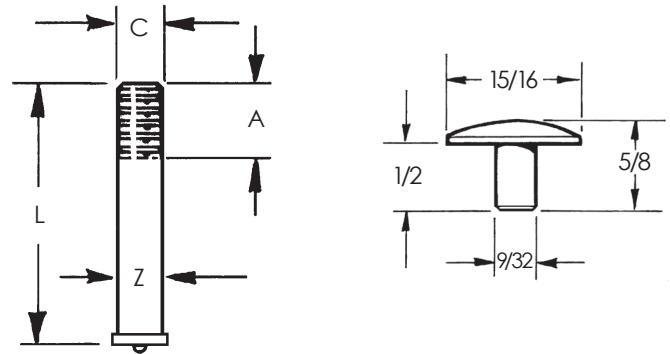
CD Weld Studs

CAR - CD ANNULAR RING (NAVY) STUDS -TECHNICAL DETAILS

CAR weld studs are available in mild steel and stainless steel materials.

CAR weld studs are used to install insulation materials. After the stud is welded in place, the insulation is impaled over the stud and then a Mushroom Navy Cap is installed onto the stud with a hammer. The cap is now locked onto the stud.

For application, dimensional and in stock assistance please contact [Complete Stud Welding](#) representative.



Stud Specifications				Standard Accessories				
Nominal Diameter	Groove Diameter	Groove Length	Min. Length	B Collet Standard 1-3/8" Long	B Collet Short 1-3/16" Long	Long Collet 2-3/8" Long	Euro Collet 1.80 Long	Collet Inserts 1-3/4" Long
Z	C	A	L	P/N *	P/N *	P/N **	P/N	P/N ***
0.188	0.175	0.312	0.750	CDB-018	CDB-018A	CDBN-018	CDBS-018	CI-010-XXX
* Note, requires B Stop, see Accessories for details								
** Note, Requires Long Style Stops, see Accessories for details								
*** Note, Collet Inserts are specific to stud length, see accessories for details.								

To order or specify give: Stud Code, Z x L, Material and Quantity

Example: CAR, .188 x 1.0, mild steel, 2000 pcs.

Materials

Low Carbon Steel - conforms to MIL-S-24149 (Tensile 60,000 PSI min. and yield 50,000 PSI min.)

Copper Plating is standard

Stainless Steel - conforms to MIL-S-24149 (Tensile 85,000 PSI min. and yield 40,000 PSI min.)

Recommended Hardware:	Part Number
Mushroom Navy Cap - Aluminum	AR-001
To order indicate P/N and Quantity - item sold separately	

See [Accessories](#) for accessory details. See [CD Stud Welding General Information](#) and [Technical Details](#) for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

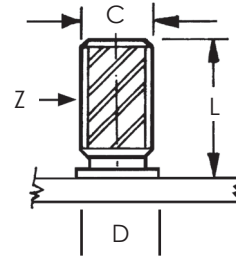
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CD Weld Studs

CMP – CD METRIC PAINT CLEARING WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding Paint Clearing (CMP) weld studs are designed to be welded in place, processed through powder coat and then accept a nut. This eliminates the need to cap studs prior to powder coat. Available in mild steel material.

For application, dimensional and technical assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications				Standard Accessories		
Thread Size	Stud Diameter	Flange Diameter	Min. Length	B Collet Standard 1-3/8" Long	Long Collet 2-3/8" Long	Euro Collet 1.80" Long
C	Z	D	L	P/N *	P/N **	P/N
M4 - .70	0.158	0.236	6mm	CDB-004M	CDBN-004M	CDBS-004M
M5 - .80	0.197	0.276	10mm	CDB-005M	CDBN-005M	CDBS-005M
M6 - 1.00	0.236	0.315	10mm	CDB-006M	CDBN-006M	CDBS-006M
M8 - 1.25	0.315	0.413	12mm	CDB-008M	CDBN-008M	CDBS-008M
* Note, requires B Stop, see Accessories for details						
** Note, Requires Long Style Stops, see Accessories for details						

To order or specify give: Stud Code, C x L, Material and Quantity

Example: CMP, M6-1.00 X 15mm, mild steel, 4500 pcs.

See **Accessories** for accessory details. See **CD Stud Welding General Information** and **Technical Details** for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

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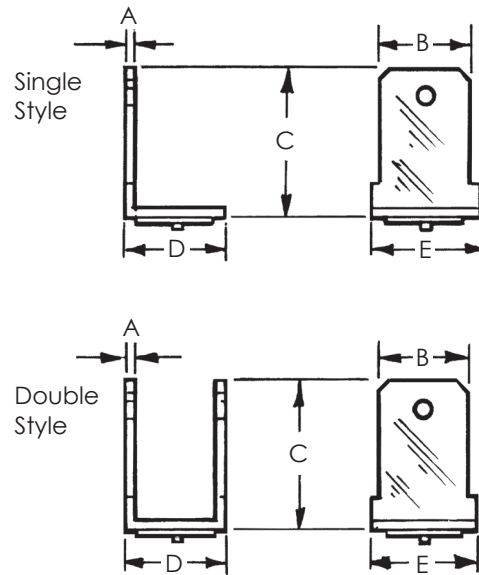
CD Weld Studs

CGS & CGD - CD GROUND STUDS- SINGLE & DOUBLE - TECHNICAL DETAILS

The CGS & CGD weld studs are stud welded in place using the CD Process. After welding in place the "Push On" style electrical terminal connectors are installed on either of these studs.

For application, dimensional and technical assistance, please contact your **Complete Stud Welding** representative.

For additional weld studs used as grounding studs see CDF, CMF, CGT and SCM stud codes.



Stud Specifications							Std. Acc.
Stud Code	Material	Thickness A	Width B	Height C	Base Width D	Base Length E	Euro Collet P/N
CGS Single	Mild Steel	0.032	0.250	0.460	0.375	0.320	82-50-050
	Stainless				0.438		
CGD Double	Mild Steel	0.032	0.250	0.460	0.438	0.320	82-50-050
	Stainless				0.438		

To order or specify give: Stud Code, Material and Quantity

Example: CGS and CGD, stainless, 3000 pcs.

See **Accessories** for accessory details. See **CD Stud Welding General Information** and **Technical Details** for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

CD Weld Studs

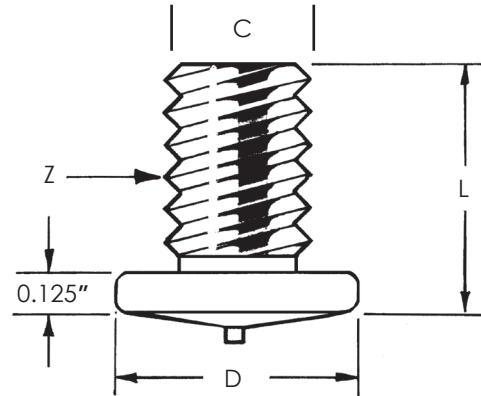
CGT – CD GROUND WELD STUDS – TECHNICAL DETAILS

The (CGT) CD Ground Weld Studs provide a larger than normal flange diameter to assist in obtaining a better ground connection than standard flanged CD studs.

CGT studs are welded in place using CD type equipment and ARC - short cycle type equipment.

CGT weld studs are available in mild and stainless steel materials.

For application, dimensional and technical assistance, please contact your [Complete Stud Welding](#) representative.



Stud Specifications				Standard Accessories		
Thread Size	Stud Diameter	Flange Diameter	Length	B Collet Standard 1-3/8" Long	Long Collet 2-3/8" Long	Euro Collet 1.80" Long
C	Z	D	L ***	P/N *	P/N **	P/N
1/4-20	0.250	0.500	0.590	CDB-025	CDBN-025	CDBS-025
M6 - 1.00	0.236	0.500	0.630	CDB-006M	CDBN-006M	CDBS-006M
M8 - 1.25	0.315	0.500	0.630	CDB-008M	CDBN-008M	CDBS-008M
* Note, requires B Stop, see Accessories for details						
** Note, Requires Long Style Stops, see Accessories for details						
*** Note, these are considered standard lengths, other lengths are special order						

To order or specify give: Stud Code, C, Material and Quantity

Example: CGT, 1/4-20, mild steel, 1,000 pcs.

See [Accessories](#) for accessory details. See [CD Stud Welding General Information](#) and [Technical Details](#) for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

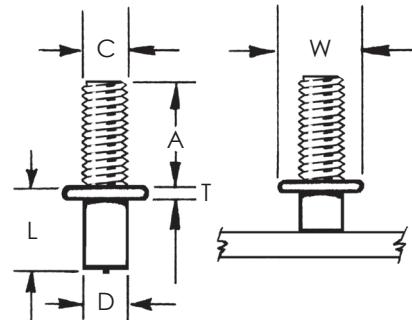
CD Weld Studs

CDC – CD THREADED COLLAR WELD STUDS – TECHNICAL DETAILS

Complete Stud Welding CDC weld studs are available in mild steel and stainless steel.

CDC weld studs are used to provide a spacer between the base metal and the attached part.

For application, dimensional, in stock and welding assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications						Standard Accessories		
Base Diameter	Min. Length	Max. Thread Diameter	Std. Thread Length	Collar Diameter	Collar Thickness	B Collet Standard 1-3/8" Long	Long Collet 2-3/8" Long	Euro Collet 1.80" Long
D	L	C	A	W	T	P/N *	P/N **	P/N
0.160	0.375	10-24	0.500	0.436	0.062	CDB-018	CDBN-018	CDBS-018
0.160	0.375	10-32	0.500	0.436	0.062	CDB-018	CDBN-018	CDBS-018
0.215	0.375	1/4 - 20	0.500	0.500	0.093	CDB-025	CDBN-025	CDBS-025
0.275	0.375	5/16 - 18	0.625	0.562	0.093	CDB-031	CDBN-031	CDBS-031
0.330	0.375	3/8 - 16	0.625	0.625	0.093	CDB-037	CDBN-037	CDBS-037

* Note, may require B Stop, see Accessories for details

** Note, may require Long Style Stops, see Accessories for details

Note, limited stock on CDC studs with metric threads

To order or specify give: Stud Code, C x L, D x A, Material and Quantity

Example: CDC, .330 x 1 w/ 3/8-16 x 5/8, mild steel, 2800 pcs.

See **Accessories** for accessory details. See **CD Stud Welding General Information** and **Technical Details** for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque values, weight charts and standard stock sizes.

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CD Weld Studs

CTB - CD CABLE TIE BASE WELD STUDS - TECHNICAL DETAILS

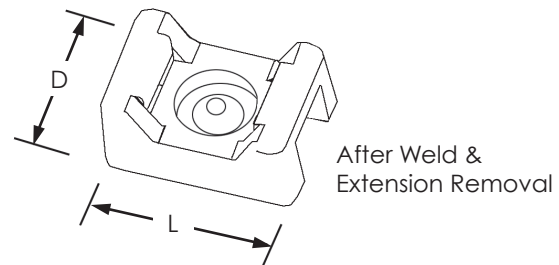
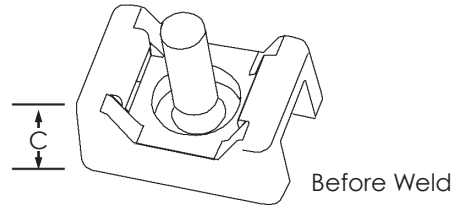
Complete Stud Welding CTB weld studs are a superior option to securing cable tie bases compared to adhesives or screws.

To install, first weld the wire tie base in place, then break off the top portion of stud and insert cable tie. Holds wire bundle up to 1 in diameter.

The retaining stud is a .188 diameter stainless steel or aluminum knock-off style CD stud.

The pull off strength of the cable tie base exceeds that of a typical 3/16 nylon wire tie.

For application, dimensional, in stock, technical details and welding assistance, please contact your **Complete Stud Welding** representative.



Cable Tie Base Specifications					Standard Accessories		
Height	Length	Width	Slot Height	Slot Width	B Collet Standard 1-3/8" Long	Long Collet 2-3/8" Long	Euro Collet 1.80" Long
C	L	D	A	W	P/N *	P/N **	P/N
0.390	0.875	0.625	0.090	0.325	CDB-018	CDBN-018	CDBS-018
* Note, requires B Stop, see Accessories for details							
** Note, requires Long Style Stops, see Accessories for details							

To order or specify give: Stud Code, Material and Quantity

Example: CTB, stainless steel, 1000 pcs.

See **Accessories** for accessory details. See **CD Stud Welding General Information** and **Technical Details** for process description, material combinations, reverse-side marking, locating options, technical details, guidelines, torque valves, weight charts and standard stock sizes.

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CD Weld Studs

CTB - CD CABLE TIE BASE WELD STUDS - TECHNICAL DATA SHEET

Nylon 6/6 Properties				
Property	ASTM Method	Test Condition	Units	Nylon 6/6
Tensile Strength	D368	+73 Degrees F, 50% RH	kpsi	11.2
Elongation at break	D368	+73 Degrees F, 50% RH	%	> 299
Yield Strength	D368	+73 Degrees F, 50% RH	kpsi	8.5
Shear Strength	D732	Dry as Molded	kpsi	9.6
Deformation Under Load	D621	2,000 psi; +122 F, DAM	%	1.4
IZOD Impact	D256	+73 Degrees F, 50% RH	ft lb/in	2.1
Tensile Impact Strength	D1822	+73 Degrees F, Long Specimen; DAM	ft lb/in	240
Melting Point	D789	Fisher-Johns	Degrees F	491
Thermal Conductivity	—	DAM Conche-Fitch	BTU-in/h*F	1.7
Brittleness Temperature	D746	50% RH	Degrees F	-85
Oxygen Index	D2683	DAM	%O	28
Oxygen Index	D2683	50% RH	%O	31
UL Flammability	UL 94	DAM	—	V-2
UL Flammability	UL 95	50% RH	—	V-2

Nylon 6/6 NBS Smoke Generation				
Test Parameters			Specific Optical Density	
Sample Thickness	UL Flammability	Energy Source	at Maximum Smoke Accumulation	At 2 Minutes
1/16	94 V-2	Radiant (2.5 watts/sp cm)	13	0
1/8	94 V-2	Radiant (2.5 watts/sp cm)	26	1

Nylon 6/6 Temperature Index			
Temperature Index			
Minimum Thickness	Electrical Degrees C	Mechanical w/o Impact Degrees C	Hot Wire Ignition (sec)
0.028	125	65	11.8
0.058	125	85	15.0

Weld Stud Dimensions and Properties					
Stud Diameter	Flange Diameter	Length	Length after knock-off *	Material Type **	Ultimate Tensile
0.190	0.265	0.780	0.180	302 SS	85 KPSI
* Excludes flange thickness					
** Along with 304 SS, meets requirements of 18-8 Stainless Steel					

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CD Weld Studs

OTHER CAPACITOR DISCHARGE “CD” WELD STUDS



Oval Head Pin



Round Head Pin



Pierced Pin



Retaining Pin



Pointed Retaining Pin



Notched Insulation Pin



Cone Head Pin



NT Shoulder Pin



Threaded
Shoulder Pin



Tapped Pad
Reduced Base



Knock-off Pin



Keyhole Stud

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SECTION 6

INSULATION PINS

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

OFFICE: 216.904.4008

EMAIL: SALES@COMPLETESTUDWELD.COM

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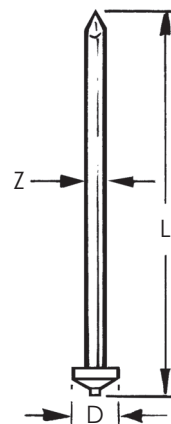
Insulation Pins

CWP – CD WELD PINS – TECHNICAL DETAILS

Weld pins are commonly used to attach blanket insulation to ducts, ovens, boilers and hot/cold equipment. The pins are welded in place, the insulation impaled over the pin and then self locking washers are installed over the pin to secure the insulation.

The CD process is used to weld CD type studs to sheet metal and plate.

For application, dimensional and technical assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications							
10 Gauge				12 Gauge			
Stud Diameter	Flange Diameter	Standard Lengths	Pounds Per 1,000 Pieces	Stud Diameter	Flange Diameter	Standard Lengths	Pounds Per 1,000 Pieces
Z	D	L		Z	D	L	
10 Gauge 0.135	0.220	1.0	5	12 Gauge 0.105	0.175	0.75	2
		1.5	7			1.0	3
		2.0	8			1.25	4
		2.5	11			1.5	5
		3.0	13			2.0	6
		3.5	15			2.5	7
		4.0	17			3.0	8
		4.5	18			3.5	9
		5.0	21			4.0	11
		5.5	22			4.5	12
		6.0	25			5.0	13
		6.5	26			5.5	14
		7.0	29			6.0	15
		8.0	33			6.5	16
		9.0	37			7.0	17
		10.0	41			8.0	20
						9.0	24

To order or specify give: Stud Code, Z x L, Material and Quantity

Example: CWP, 10 Ga. X 4, Mild Steel, 5000 pcs.

Materials: Low carbon steel (copper plated), stainless steel 18-8 and aluminum are standard. Other materials are available upon request. Material is annealed as required.

Plating: Galvanized Weld Pins and other coatings are available.

Accessories: See the Accessories section for details. P/N's CDB-013, CDB-013A, CDBN-013, CDBS-013, CIP-014-075 and CDB-010, CDB-010A, CDBN-010, CDBS-010, CIP-010-075

Self Locking Washers: See Technical Details in this section.

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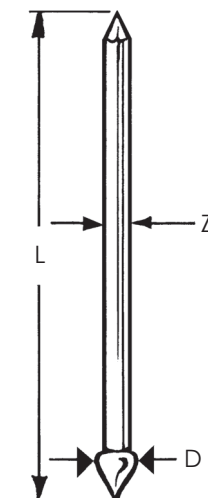
Insulation Pins

CPT - CD POWER TIP WELD PINS - TECHNICAL DETAILS

Weld pins are commonly used to attach blanket insulation to ducts, ovens, boilers and hot / cold equipment. The pins are welded in place, the insulation impaled over the pin and then self locking washers are installed over the pin to secure the insulation.

The CD Stud Welding process is used to weld CPT's to sheet metal and plate.

For application, dimensional and technical assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications							
10 Gauge				12 Gauge			
Stud Diameter	Base	Standard Lengths	Pounds Per 1,000 Pieces	Stud Diameter	Base Diameter	Standard Lengths	Pounds Per 1,000 Pieces
Z	D	L		Z	D	L	
10 Gauge 0.135	0.220	2.5	11	12 Gauge 0.105	0.220	2.5	6
		3.0	14			3.0	8
		3.5	16			3.5	10
		4.0	18			4.0	11
		4.5	20			4.5	12
		5.0	21			5.0	13
		5.5	22			5.5	14
		6.0	26			6.0	15
		7.0	29			7.0	18
		8.0	34			8.0	20

To order or specify give: Stud Code, Z x L, Material and Quantity

Example: CPT, 12 Ga. X 3", Mild Steel, 6000 pcs.

Materials: Low carbon steel (copper plated) and stainless steel are standard. Other materials are available upon request. Material is annealed as required.

Plating: Galvanized Weld Pins and other coatings are available.

Accessories: See the Accessories section for details. P/N's CDB-013, CDB-013A, CDBN-013, CDBS-013, CIP-014-075 and CDB-010, CDB-010A, CDBN-010, CDBS-010, CIP-010-075

Self Locking Washers: See Technical Details in this section.

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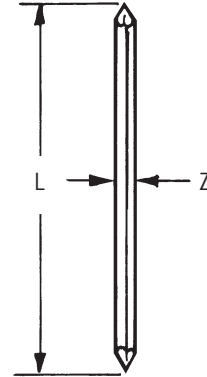
Insulation Pins

DPW – DOUBLE POINTED WELD PINS – TECHNICAL DETAILS

Weld pins are commonly used to attach blanket insulation to ducts, ovens, boilers and hot / cold equipment. The pins are welded in place, the insulation impaled over the pin and then self locking washers are installed over the pin to secure the insulation.

The ARC Stud Welding process is used to weld DPW's to sheet metal and plate.

For application, dimensional and technical assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications				Standard Accessories		
Stud Diameter	Standard Lengths	Pounds Per 1,000 Pieces	Ferrule	Foot	Grip	Chuck
Z	L		P/N	P/N	P/N	P/N
10 Gauge 0.135	1.5	7	F014-F	B-1N	GC-019	CN-013
	2.0	9				
	2.5	11				
	3.0	13				
	3.5	15				
	4.0	17				
	4.5	19				
	5.0	21				
	5.5	23				
	6.0	25				
	6.5	27				
	7.0	29				
	7.5	31				
	8.0	33				

To order or specify give: Stud Code, Z x L, Material and Quantity

Example: DPW, 10 Ga. X 3.5", Mild Steel, 2500 pcs.

Materials: Low carbon steel (copper plated), stainless steel 18-8 and aluminum are standard. Other materials are available upon request. Material is annealed as required.

Plating: Galvanized Weld Pins and other coatings are available.

Self Locking Washers: See TECHNICAL DETAILS in this section.

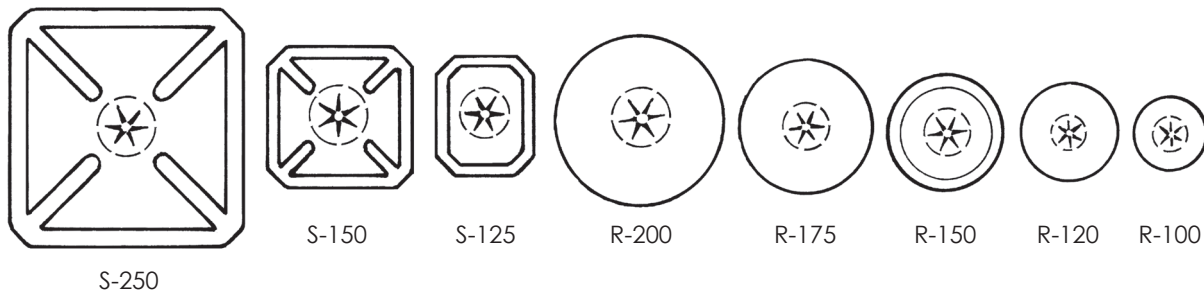
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Insulation Pins

WAS & WAR – SELF LOCKING WASHERS “SPEED CLIPS” – TECHNICAL DETAILS

After weld pins are welded in place and insulation is impaled over the weld pins, the Self Locking Washers are installed onto the weld pins to retain the insulation.

For application, dimensional and technical assistance, please contact your **Complete Stud Welding** representative.



Washer Specifications							
Type / Code	Size	Hole Gauge	Material	Edge	Thickness	Pounds per 1000 pieces	Box Quantity
Square							
WAS-250	2.5 x 2.5	10 Gauge	Mild Steel	Beveled	0.016	28	1000
WAS-150	1.5 x 1.5	12 Gauge	(Galvanized)	Beveled		10	
WAS-125	1 x 1.25	or 14 Gauge	Stainless and Aluminum	Beveled		6	
Round							
WAR-200	2.00	10 Gauge	Mild Steel	Beveled	0.016	14	1000
WAR-175	1.75	12 Gauge	(Galvanized)	Flat		12	
WAR-150	1.50	or	Stainless and	Beveled		9	
WAR-120	1.20	14 Gauge	Aluminum	Beveled		6	
WAR-100	1.00			Beveled		4	

To order or specify give: Product Code, Hole Gauge, Material and Quantity

Example: WAS-150, 10Ga., mild steel, 9000 pcs.

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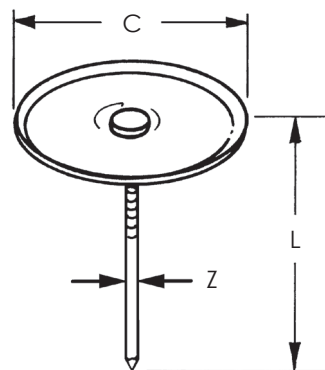
Insulation Pins

CHP – CD CUPPED HEAD WELD PINS – TECHNICAL DETAILS

Weld pins are commonly used to attach blanket insulation to ducts, ovens, boilers and hot / cold equipment. The insulation material is placed on the surface, the Cupped Head Pin pushed through the insulation and then welded to the base metal.

The CD Stud Welding process is best suited for welding CHP's to sheet metal and plate.

For application, dimensional and technical assistance, please contact your **Complete Stud Welding** representative.



Stud Specifications							
Standard Cupped Head Pins				Mini Cupped Head Pins			
Stud Diameter	Cup Head Diameter	Standard Lengths	Pounds Per 1,000 Pieces	Stud Diameter	Cup Head Diameter	Standard Lengths	Pounds Per 1,000 Pieces
Z	C	L		D	C	L	
12 Gauge 0.105	1.500	0.375	9	12 Gauge 0.105	1.188	0.375	6
		0.500	10			0.500	7
		0.625	11			0.625	8
		0.750	11			0.750	8
		0.875	11			0.875	8
		1.000	11			1.000	8
		1.125	12			1.125	9
		1.250	12			1.250	9
		1.375	12			1.375	9
		1.500	12			1.500	9
		1.625	12			1.625	9
		1.750	13			1.750	9
		1.875	13			1.875	10
		2.000	13			2.000	10
		2.125	14			2.125	11
		2.250	14			2.250	11
		2.500	14			2.500	11
		2.626	15			2.626	12
		2.875	15			2.875	12
		3.000	16			3.000	13
		3.125	16			3.125	13
		3.500	17			3.500	14
		4.000	18			4.000	15
		4.125	18			4.125	15
		4.500	19			4.500	16
		5.000	20			5.000	17
		5.500	21			5.500	18
		6.000	23			6.000	19

To order or specify give: Stud Code, C x L, Material and Quantity

Example: CHP, 1.5 x 2.125", 3000 pcs.

Materials: Low carbon steel

Plating: The washer and pin are Galvanized.

Paper Washers: Sold separately either in bulk or installed on the CHP

Accessories: See the Accessories section for details -
1piece Chuck P/N 039-613 and multi part Chuck P/N 035-301

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SECTION 7

METRIC WELD STUDS

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

OFFICE: 216.904.4008

EMAIL: SALES@COMPLETESTUDWELD.COM

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Metric Weld Studs

METRIC WELD STUDS - GUIDE

The chart below indicates the weld studs commonly supplied in metric sizes. The technical details for the stud type or styles throughout this literature apply to metric studs. Should additional specifications be required, please indicate this in the Request for Quote.

Some types or styles of weld studs are used in the imperial size when requested in a metric size because the difference is not meaningful to the application (ie. HCA's, HSC's, DBA's and PSR's). Should the substitution not be possible, please note this on the Request for Quote.

Stud Type / Style	Applicable Comments
ARC Weld Studs:	
Threaded - Externally	Various metric sizes are stocked.
Threaded - Internally	Generally these are made to order. Metric taps are common
No Thread	Generally metric sizes are made to order
CD Weld Studs:	
Threaded - Externally	Various metric sizes are stocked
Threaded - Internally	Some flanged metric sizes are stocked. Many metric tap studs are made to order.
No Thread	Generally metric sizes are made to order
Short Cycle Weld Studs:	
Threaded - Externally	Various metric sizes are stocked.
Threaded - Internally	Generally these are made to order. Metric taps are common
No Thread	Generally metric sizes are made to order

Note, Threaded - internally studs are commonly made to order due to the weld stud dimensions, tap size and or tap depth required by the application. Threaded - internally studs are often called "Tap Studs" or "Tapped Pads."

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SECTION 8

SHORT CYCLE STUD WELDING GENERAL INFORMATION & TECHNICAL DETAILS

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

OFFICE: 216.904.4008

EMAIL: SALES@COMPLETESTUDWELD.COM

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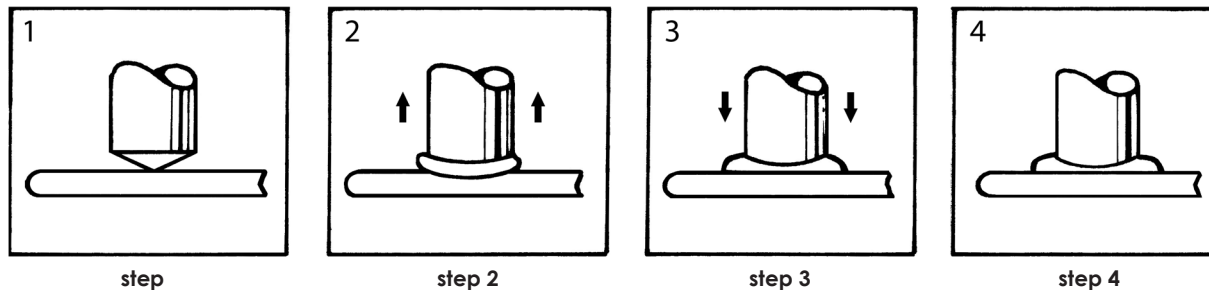
Short Cycle Stud Welding

SHORT CYCLE STUD WELDING PROCESS DESCRIPTION

Short Cycle Drawn Arc Stud Welding is commonly referred to as "Short Cycle Stud Welding" or "SC."

The SC welding sequence is the same as the sequence of ARC Stud Welding, however, with relatively higher currents and shorter welding times (100 milliseconds).

The SC welding process is very suitable for stud diameters up to 1/2" (12mm) on thin sheets. To achieve a high welding quality, use of a shielding gas is recommended.



1) The welding gun is positioned over the base material and the main gun spring is partially compressed.

2) The trigger is pressed and the stud lifts off the base material, drawing an arc. The arc melts the end of the weld stud and the base material below. The process times out and the main current is shut off.

3) The main spring plunges the weld stud down into the molten pool of metal in the base material. The cycle is complete and the resulting weld bond develops full strength of the fastener in the weld zone.

4) The weld gun is withdrawn from the weld stud.

Short Cycle Stud Welding

SHORT CYCLE WELD STUDS – TECHNICAL DETAILS

Threaded & No Thread Short Cycle (SC) Weld Studs: Complete Stud Welding has various sizes of externally and internally threaded weld studs and various sizes of no thread weld studs. These weld studs are used in various automotive and industrial applications.

Threads: The chart below depicts the thread standards for imperial and metric external and internal threads. Unless requested or quoted otherwise, threads will be quoted based on these common thread standards.

Unless indicated or quoted otherwise, external threads will be a rolled type thread. The strength and surface finish of rolled threads are considered to be superior to cut type threads.

Thread Type	External Threads	Internal Threads
Imperial Threads - Coarse	UNC-2A	UNC-2B
Imperial Threads - Fine	UNF-2A	UNF-2B
Metric Threads	Class 6g	Class 6H

Auto Feed Quality: All SC weld studs are available in auto feed quality. This allows for usage in auto feed stud welding systems. Auto feed hand guns and weld heads are available with the power source(s) and feeding equipment for incorporation into automated CNC and robotic systems. Auto feed quality should be requested at the time of quotation.

Material: The chart below depicts the common material types with corresponding typical tensile strengths used to produce SC Weld Studs.

Note, all externally threaded mild steel SC studs are copper flashed / plated.

Material Type(s)	Typical Tensile Strength	
	Ultimate (psi)	Yield (psi)
Mild Steel C1006 -C1018 range	55,000	35,000
Stainless Steel 18-8 (302HQ & 304)	75,000	30,000
Aluminum Alloy 5356 & 5154	40,000	29,000
Aluminum Alloy 1100	21,000	20,000

Short Cycle Stud Welding

SHORT CYCLE WELD STUDS – TECHNICAL DETAILS

Plating: For mild steel studs, copper plating is standard for externally threaded studs. Upon request Nickel, Zinc and other plating's are available.

Annealing: All low carbon steel and stainless steel studs are annealed where required.

Weld Base: Studs are available in the Flanged condition. Other flange diameters and weld base dimensions are quoted upon request.

Length Reduction: SC Studs have an approximate length reduction from welding of 0.030 inches.

Flux: SC Studs are not flux loaded.

Shielding: The SC Process does not require shielding gas up through 1/4" diameter studs, however, in most cases it is recommended to use a shielding gas.

Welding Position: SC Studs can be welded in the down hand, side hand and overhead positions. In the side hand and overhead positions this becomes increasingly more difficult as the stud diameter increases.

Available Sizes: SC studs are available in diameters up through 1/2" (M12) and length is not a limitation. SC studs over 3/8" Diameter typically do not have a flange and are made to order.

Visual Inspection: The weld is acceptable if a 360 degree weld flash is present.

Mechanical Testing: Testing can be done by bend testing or torque testing. The bend test should be done by bending the stud 30 degrees by striking with a hammer or bending with a pipe.

For torque testing, please refer to the CD Stud Weld Inspection - Mechanical (torque values). These values are the same for SC type studs.

Weight Charts: Please see the CD Weld Stud Weight Charts for these values.

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SECTION 9

SHORT CYCLE WELD STUDS

FOR INQUIRIES, TO PLACE ORDERS,
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ANY OF THE FOLLOWING:

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EMAIL: SALES@COMPLETESTUDWELD.COM

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Short Cycle Weld Studs

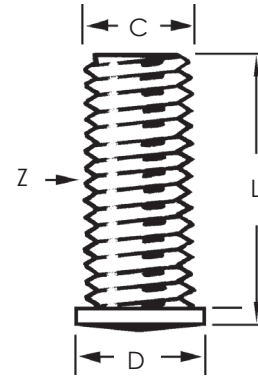
SCT - SHORT CYCLE THREADED WELD STUDS - TECHNICAL DETAILS

The CD Drawn ARC process and the ARC Short Cycle process are the best equipment options for welding of Short Cycle weld studs.

In some applications the Standard ARC Process can be used without the ceramic ferrule.

The small flange diameter allows for components to be easily mounted on welded studs.

For assistance contact your [Complete Stud Welding](#) representative.



Stud Specifications				Standard Accessories			
Thread Size	Stud Diameter	Flange Diameter	Min. Length	Standard Adjustable Chuck	Standard Adjustable Chuck Long Style	Long Collet 2-3/8" Long	Euro Collet 1.80" Long
C	Z	D	L	P/N	P/N	P/N *	P/N
4-40	0.112	0.143	0.250	CN-010	CM-010	CDBN-010	CDBS-010
6-32	0.138	0.169	0.250	CN-013	CM-013	CDBN-013	CDBS-013
8-32	0.164	0.195	0.250	CN-015	CM-015	CDBN-015	CDBS-015
10-24	0.190	0.221	0.250	CN-018	CM-018	CDBN-018	CDBS-018
10-32	0.190	0.221	0.250	CN-018	CM-018	CDBN-018	CDBS-018
1/4-20	0.250	0.281	0.250	CN-025	CM-025	CDBN-025	CDBS-025
5/16-18	0.312	0.344	0.500	CN-031	CM-031	CDBN-031	CDBS-031
3/8-16	0.375	0.418	0.500	CN-037	CM-037	CDBN-037	CDBS-037

* Note, Requires Long Style Stops, see Accessories for details

To order or specify give: Stud Code, C x L, Material and Quantity

Example: SCT, 10-24 X 0.50, mild steel, 8000 pcs.

See [Accessories](#) for accessory detail.

See [Short Cycle Stud Welding – General Information and Technical Details](#) for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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Short Cycle Weld Studs

SCM – SHORT CYCLE THREADED WELD STUDS – METRIC THREAD SIZES

This information is under construction.

Please contact your **Complete Stud Welding** representative for assistance.

under construction

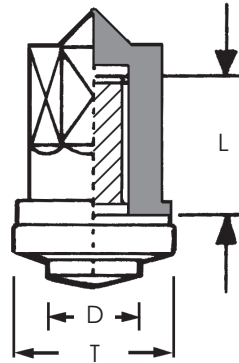
Short Cycle Weld Studs

SCM – SHORT CYCLE GROUND STUD W/ CAP – TECHNICAL DETAILS

The ARC Short Cycle process is the best equipment option for welding Short Cycle Ground Studs.

The Standard ARC Process can be used without the ceramic ferrule. Gas shielding is recommended regardless of process used.

Studs are available with or without the caps installed. Studs are available in mild steel and 18-8 stainless steel. Mild steel studs are copper or nickel plated.



The Short Cycle Ground Stud is used as a ground stud in several automotive and industrial applications. The plastic cap protects the threads and washer face during paint operations. Once the cap is removed, the paint free washer face and threads provide an excellent connection point for ground terminals.

Stud Specifications					Standard Accessories *		
Thread Size	Thread Length	Weld Base Diameter	Collar Diameter	Washer Face Diameter	Standard Adjustable Chuck	Standard Adjustable Chuck Long Style	Euro Collet 1.80" Long
C	L	D	T	W	P/N	P/N	P/N
M6-1.00	0.472	0.317	0.550	0.460	CN-006M	CM-006M	CDBS-006M
	0.591						
M8-1.25	0.472	0.390			CN-008M	CM-008M	CDBS-008M
	0.591						
* For Chucks & Collet to weld with the cap installed, contact your CSW Representative							

To order or specify give: Stud Code, C x L, Material and Quantity

Example: SCM, M6-1.00 X .472, mild steel, 5000 pcs.

See [Accessories](#) for accessory detail.

See [Short Cycle Stud Welding – General Information and Technical Details](#) for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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Short Cycle Weld Studs

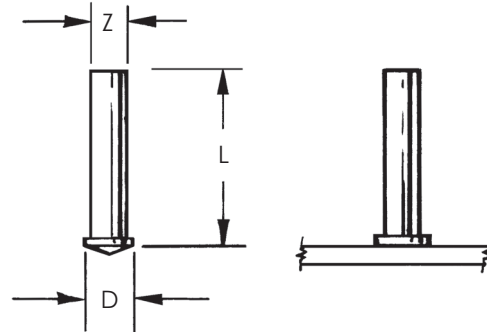
SCN – SHORT CYCLE NO THREAD WELD STUDS – TECHNICAL DETAILS

The CD Drawn ARC process and the ARC Short Cycle process are the best equipment options for welding of Short Cycle weld studs.

In some applications the Standard ARC Process can be used without the ceramic ferrule.

The small flange diameter allows for components to be easily mounted on welded studs.

For assistance contact your [Complete Stud Welding](#) representative.



Stud Specifications			Standard Accessories			
Stud Diameter	Flange Diameter	Min. Length	Standard Adjustable Chuck	Standard Adjustable Chuck Long Style	Long Collet 2 3/8" Long	Euro Collet 1.80" Long
Z	D	L	P/N	P/N	P/N*	P/N
0.094	0.143	0.250	CA	CA	CA	CA
0.112	0.156	0.250	CN-010	CM-010	CDBN-010	CDBS-010
0.125	0.156	0.250	CN-012	CM-012	CDBN-012	CDBS-012
0.138	0.195	0.250	CN-013	CM-013	CDBN-013	CDBS-013
0.156	0.221	0.250	CN-004M	CM-004M	CDBN-004M	CDBS-004M
0.164	0.221	0.250	CN-015	CM-015	CDBN-015	CDBS-015
0.188	0.221	0.250	CN-018	CM-018	CDBN-018	CDBS-018
0.215	0.281	0.250	CA	CA	CA	CA
0.250	0.281	0.250	CN-025	CM-025	CDBN-025	CDBS-025
0.273	0.343	0.375	CA	CA	CA	CA
0.312	0.344	0.500	CN-031	CM-031	CDBN-031	CDBS-031
0.375	0.418	0.500	CN-037	CM-037	CDBN-037	CDBS-037
* Note, Requires Long Style Stops, see Accessories for details						
CA - Check Availability - not standard stock items						

To order or specify give: Stud Code, D x L, Material and Quantity

Example: SCN, .156 X 0.75, mild steel, 2000 pcs.

See [Accessories](#) for accessory detail.

See [Short Cycle Stud Welding – General Information and Technical Details](#) for industry specifications, thread options, Before Weld (BW) length, flux, raw material details, plating options, annealing, load strengths and shipping weights.

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SECTION 10

CABLE HANGERS & CLAMPS

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

OFFICE: 216.904.4008

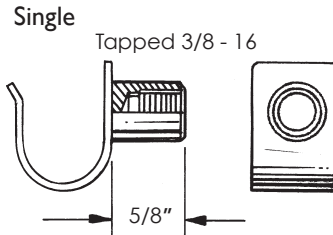
EMAIL: SALES@COMPLETESTUDWELD.COM

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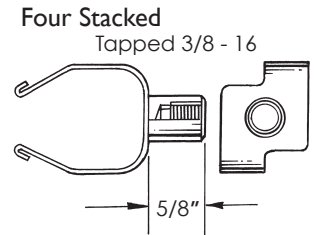
Cable Hangers - Crimp Type

CRIMP TYPE - TECHNICAL DETIALS

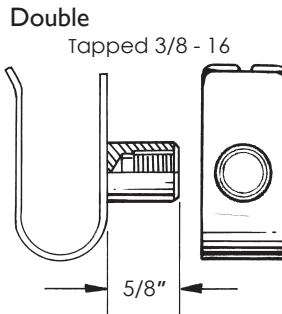
Catalog No.	Cable Dia. in inches From — To	
JCT 1020	.305	.371
JCT 1040	.375	.531
JCT 1051	.531	.680
JCT 1026	.437	.750
JCT 1027	.680	.900
JCT 1030	.750	1.000
JCT 1031	.900	1.224



Catalog No.	Cable Dia. in inches
JCT 1181	.531

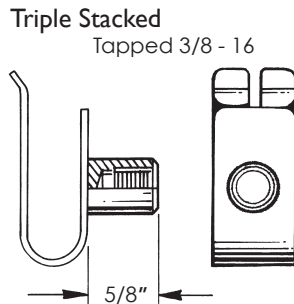


Catalog No.	Cable Dia. in inches From — To	
JCT 2001	.305	.371
JCT 1052	.375	.531
JCT 1162	.531	.680
JCT 2002	.437	.750
JCT 2003	.680	.900
JCT 2004	.750	1.000
JCT 2005	1.000	1.224

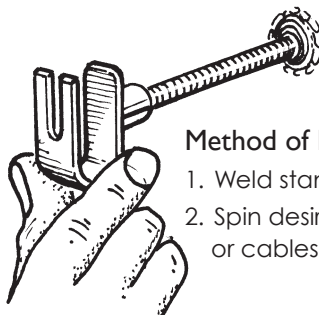


Catalog No.	Cable Dia. in inches
JCT 1041	.500
JCT 1042	1.000
JCT 1043	.750
JCT 1044	1.224
JCT 1045	.680

Catalog No.	Cable Dia. in inches From — To	
JCT 1170	.531	.531
JCT 1171	.325	.371



Cable Hangers are available in Mild Steel and Stainless Steel types 304 and 316.



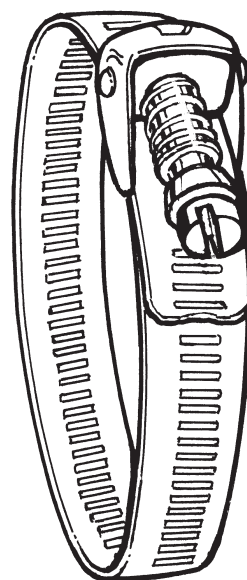
Method of Fastening

1. Weld standard 3/8" dia. stud to overhead deck or bulkhead.
2. Spin desired hanger (crimp, plate or tubular type) onto stud. Secure cable or cables by crimping hanger or banding, depending on type of hanger.

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JWC & JSC – CABLE CLAMPS – TECHNICAL DETAILS

Swivel Action Worm Drive - JWC



Standard Snaplock - JSC
1/16" hex head screw

Technical drawing of a clamp assembly. The drawing includes two views: a top view and a side view. Dimensions are provided in millimeters (mm) and inches (in).

Top View Dimensions:

- Overall width: 31.6 mm / 1.22 in
- Distance from left edge to center of clamp: 27.8 mm / 1.09 in
- Distance from center of clamp to right edge: 14.3 mm / .56 in
- Clamp diameter: 1.8 mm / .07 in

Side View Dimensions:

- Overall height: 20.6 mm / .81 in
- Distance from top edge to center of clamp: 7.9 mm / .31 in
- Distance from center of clamp to bottom edge: 14.3 mm / .56 in

Labels:

- Clamp Diameter
- millimeter
- inch

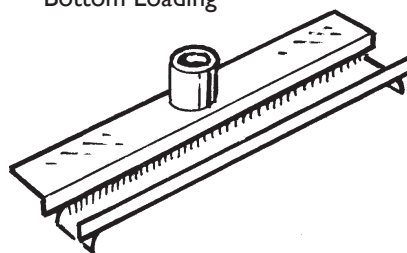
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Cable Hangers - Plate Type

PLATE TYPE

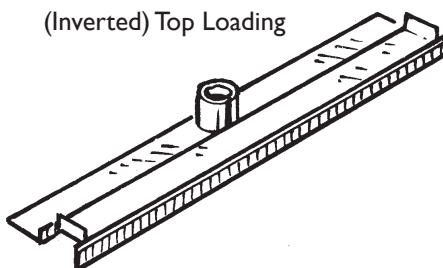
Catalog No.	Length-A in Inches
JPT 15002	2
JPT 15003	3
JPT 15004	4
JPT 15006	6
JPT 15008	8

Bottom Loading



Catalog No.	Length-A in Inches
JPT 16002	2
JPT 16003	3
JPT 16004	4
JPT 16006	6
JPT 16008	8

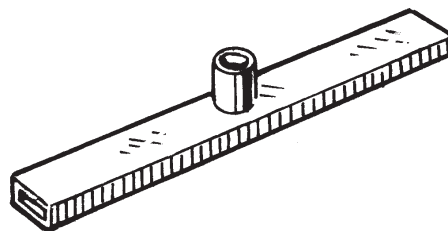
(Inverted) Top Loading



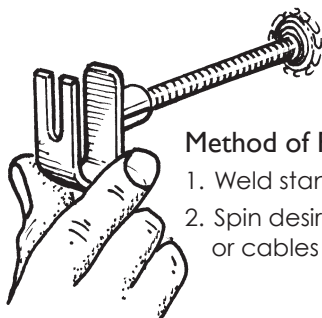
TUBULAR TYPE

Catalog No.	Length-A in Inches
JTT 0150	1.50
JTT 0250	2.50
JTT 0350	3.50
JTT 0450	4.50
JTT 0550	5.50
JTT 0650	6.50
JTT 0750	7.50

7/8" x 3/8" Rectangular



Cable Hangers are available in Mill Steel and Stainless Steel types 304 and 316.



Method of Fastening

1. Weld standard 3/8" dia. stud to overhead deck or bulkhead.
2. Spin desired hanger (crimp, plate or tubular type) onto stud. Secure cable or cables by crimping hanger or banding, depending on type of hanger.

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SECTION 11

FERRULE OPTIONS & DETAILS

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

OFFICE: 216.904.4008

EMAIL: SALES@COMPLETESTUDWELD.COM

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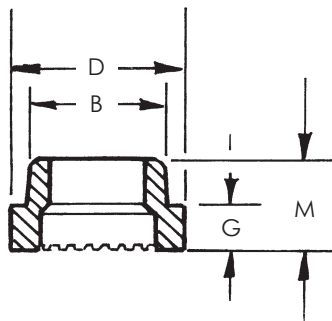
Furrules

FERRULE OPTIONS & COMMON USAGE

Ferrule Options & Common Usage			
Surface	Ferrule Option	Base of Weld Stud	Comment
Flat	Flat	Full Base	For welding full base studs
	Heavy Duty	Full Base	For welding in applications where the "Flat" ferrule is prone to breaking
	Low Profile	Full Base	For welding studs shorter than 1.0" in length
	Vertical	Full Base	For welding in the side hand position / vertical surface
	Weld Thru Deck	Full Base	Specific to the Weld Thru Deck (WTD) application
	Reduced Base	Less than stud Dia.	Specific to welding Reduced Base type weld studs
	Pitch	Pitch Diameter	For welding partially threaded studs
	Thru Bore	Less than stud Dia.	Used for specific applications and or weld base diameters
	Collar Stud	Pitch Diameter	For welding Collar Stud type studs
	Angle to Work	Full Base	Required for very specific applications
	Rectangular	Rectangular	For welding Rectangular Type (shaped) studs
Inside Corner	Inside Angle	Full Base	For welding to the inside angle
Outside Corner	Outside Angle	Full Base	For welding to the outside angle
Round	Curved	Various	For welding to round / curved surface
Edge	Edge	Full Base	For welding stud to edge of plate
Other	Special	All	When needed, ferrules are designed and made to meet application needs
NOTE, Full Base means the full diameter (ie. 1/4", 5/16", 3/8", 7/16", 1/2", 5/8", 3/4", 7/8" or 1") of the stud is to be welded.			

Furrules

STANDARD FERRULES



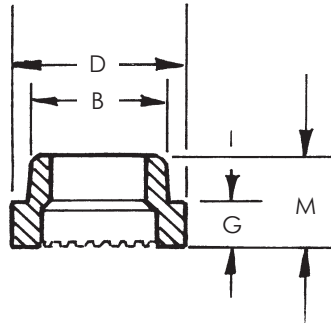
Standard Ferrules						
Type	Nominal Size	CSW Part Number	D	B	M	G
F (Flat)	3/16	F019-F	0.390	0.281	0.390	0.234
	1/4	F025-F	0.455	0.380	0.390	0.234
	5/16	F031-F	0.578	0.455	0.390	0.234
	3/8	F037-F	0.640	0.505	0.390	0.234
	7/16	F043-F	0.703	0.585	0.422	0.234
	1/2	F050-F	0.795	0.650	0.438	0.250
	5/8	F062-F	1.030	0.785	0.516	0.328
	3/4	F075-F	1.218	1.030	0.656	0.468
	7/8	F087-F	1.406	1.210	0.732	0.544
	1	F100-F	1.610	1.406	0.820	0.632
HD (Heavy Duty)	1/4	F025-HD	0.645	0.515	0.390	0.240
	3/8	F037-HD	0.800	0.645	0.400	0.250
	1/2	F050-HD	0.875	0.785	0.455	0.270
	5/8	F062-HD	1.230	1.035	0.520	0.335
LP (Low Profile)	1/4	F025-LP	0.457	0.380	0.282	0.165
	5/16	F031-LP	0.595	0.505	0.265	0.141
	3/8	F037-LP	0.650	0.515	0.308	0.200
	1/2	F050-LP	0.835	0.657	0.305	0.165
	5/8	F062-LP	1.024	0.794	0.433	0.285
	3/4	F075-LP	1.250	1.025	0.465	0.265
V (Vertical)	1/4	F025-V	0.450	0.370	0.390	0.240
	3/8	F037-V	0.640	0.500	0.400	0.240
	1/2	F050-V	0.795	0.655	0.455	0.270
	5/8	F062-V	1.020	0.785	0.520	0.335
	3/4	F075-V	1.220	1.030	0.660	0.475
	7/8	F087-V	1.436	1.221	0.769	0.577
TD (Weld Thru Deck)	3/8	F037-TD	0.893	0.794	0.442	0.286
	1/2	F050-TD	0.800	0.645	0.450	0.265
	5/8	F062-TD	1.015	0.775	0.525	0.340
	3/4	F075-TD	1.335	1.210	0.600	0.415
	7/8	F087-TD	1.528	1.406	0.666	0.466

For other ferrule options (including Angle to Work, Rectangular, Curved, Edge) contact your **Complete Stud Welding** Representative.

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Furrules

STANDARD FERRULES



Standard Furrules						
Type	Nominal Size	CSW Part Number	D	B	M	G
R (Reduced Base)	3/8	F037-R	0.595	0.505	0.250	0.250
	7/16	F043-R	0.675	0.585	0.250	0.250
	1/2	F050-R	0.740	0.650	0.281	0.281
	5/8	F062-R	0.875	0.785	0.281	0.281
	3/4	F075-R	1.030	0.921	0.375	0.375
B (Thru-Bore)	3/8	F037-B	0.647	0.506	0.405	0.252
	1/2	F050-B	0.804	0.637	0.534	0.341
P (Pitch)	1/4	F025-P	0.455	0.380	0.250	0.125
	5/16	F031-P	0.535	0.445	0.250	0.125
	3/8	F037-P	0.595	0.505	0.265	0.140
	7/16	F043-P	0.675	0.585	0.329	0.173
	1/2	F050-P	0.740	0.650	0.362	0.206
	5/8	F062-P	0.905	0.785	0.433	0.277
	3/4	F075-P	1.150	1.030	0.526	0.339
	7/8	F087-P	1.330	1.203	0.593	0.406
TC (Collar Stud)	1	F100-P	1.526	1.406	0.661	0.474
	1/4	F025-TC	0.875	0.785	0.250	0.250
	5/16	F031-TC	0.875	0.785	0.250	0.250
	3/8	F037-TC	0.875	0.785	0.250	0.250
	1/2	F050-TC	1.203	1.045	0.281	0.281
IA (Inside Angle)	1/4	F025-IA	0.586	0.377	0.505	0.362
	3/8	F037-IA	0.650	0.505	0.495	0.335
	1/2 - Radius 1/4"	F050-IA25	0.808	0.673	0.668	0.468
	1/2 - Radius 3/8"	F050-IA37	0.818	0.667	0.684	0.505
	5/8 - Radius 1/4"	F062-IA25	1.034	0.800	0.923	0.733
	5/8 - Radius 3/8"	F062-IA37	1.034	0.800	0.904	0.719
	3/4 - Radius 3/8"	F075-IA37	1.253	1.033	1.016	0.822
OA (Outside Angle)	1/4	F025-OA	0.577	0.432	0.412	0.286
	3/8	F037-OA	0.709	0.505	0.682	0.526
	1/2	F050-OA	1.041	0.794	0.842	0.648
	5/8	F062-OA	1.043	0.790	0.927	0.729
	3/4	F075-OA				

For other ferrule options (including Angle to Work, Rectangular, Curved, Edge) contact your **Complete Stud Welding** Representative.

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SECTION 12

ACCESSORIES

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

OFFICE: 216.904.4008

EMAIL: SALES@COMPLETESTUDWELD.COM

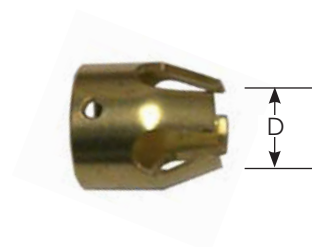
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website www.completestudweld.com e-mail sales@completestudweld.com
32035 Creekside Drive, Cleveland, Ohio 44124 fax 216.378.0349 telephone 216.904.4008

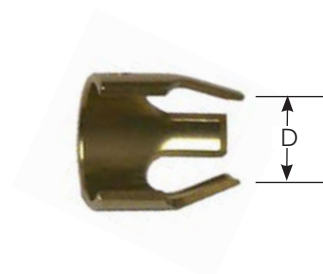
Accessories

FERRULE GRIP - TECHNICAL DETAILS

Stud Size	Foot Size	Grip Dia. "D"	Part #
3/16	Small	0.305	GN-019
1/4	Small	0.380	GN-025
5/16	Small	0.445	GN-031
3/8	Small	0.505	GN-037
7/16	Small	0.585	GN-043
1/2	Small	0.650	GN-050
5/8	Medium	0.785	GN-062
3/4	Medium	1.030	GN-075
7/8	Large	1.203	GN-087
1"	Large	1.406	GN-100



Split Ferrule Grip (1" Long) BRASS			
Stud Size	Foot Size	Grip Dia. "D"	Part #
3/16	Small	0.305	GC-019
1/4	Small	0.380	GC-025
5/16	Small	0.445	GC-031
3/8	Small	0.505	GC-037
7/16	Small	0.585	GC-043
1/2	Small	0.650	GC-050
5/8	Medium	0.785	GC-062
3/4	Medium	1.030	GC-075
7/8	Large	1.203	GC-087
1"	Large	1.406	GC-100



Long Split Ferrule Grip (2" Long) Brass			
Stud Size	Foot Size	Grip Dia. "D"	Part #
3/16	Small	0.305	GC-019
1/4	Small	0.380	GC-025
5/16	Small	0.445	GC-031
3/8	Small	0.505	GC-037
7/16	Small	0.585	GC-043
1/2	Small	0.650	GC-050
5/8	Medium	0.785	GC-062
3/4	Medium	1.030	GC-075



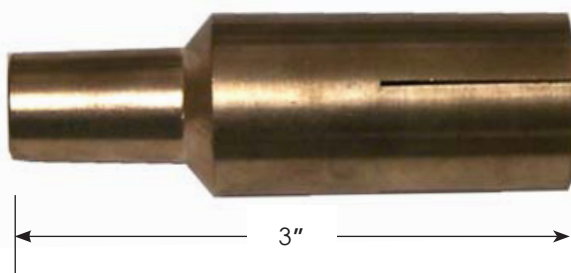
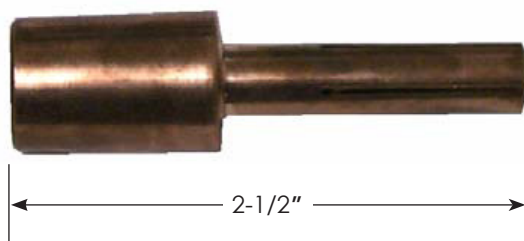
For special sizes and copper grips contact your **Complete Stud Welding** Representative.

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Accessories

CHUCKS – TECHNICAL DETAILS

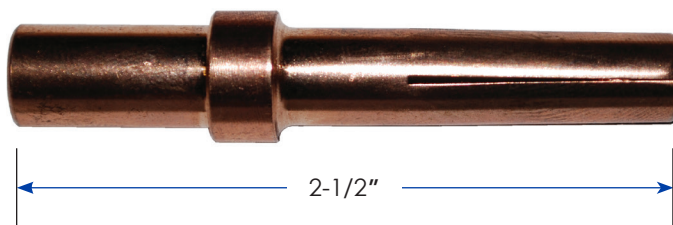
Standard Adjustable Chucks	
Stud Dia.	Part #
2mm (0.079)	CN-002M
#2	CN-008
12 GA & #4	CN-010
3mm (0.116)	CN-003M
1/8 & #5	CN-012
10 GA & #6	CN-013
4mm (0.155)	CN-004M
#8	CN-015
#10	CN-018
5mm (0.196)	CN-005M
6mm (0.236)	CN-006M
0.215	CN-021
0.330	CN-033
1/4	CN-025
5/16	CN-031
8mm (0.315)	CN-008M
3/8	CN-037
10mm (0.390)	CN-010M
7/16	CN-043
12mm (0.472)	CN-012M
1/2	CN-050
14mm (0.551)	CN-014M
9/16	CN-056
5/8	CN-062
16MM (0.63)	CN-016M
0.680	CN-068
18mm (0.708)	CN-018M
3/4	CN-075
7/8	CN-087
20mm (0.787)	CN-020M
1"	CN-100



Accessories

CHUCKS – TECHNICAL DETAILS

EURO Standard Adjustable Chucks	
Stud Dia.	Part #
2mm (0.079)	CN-002M - HBS
#2	CN-008 - HBS
12 GA & #4	CN-010 - HBS
3mm (0.116)	CN-003M - HBS
1/8 & #5	CN-012 - HBS
10 GA & #6	CN-013 - HBS
4mm (0.155)	CN-004M - HBS
#8	CN-015 - HBS
#10	CN-018 - HBS
5mm (0.196)	CN-005M - HBS
0.215	CN-021 - HBS
6mm (0.236)	CN-006M - HBS
1/4	CN-025 - HBS
5/16	CN-031 - HBS
8mm	CN-008M - HBS
0.330	CN-033 - HBS
3/8	CN-037 - HBS
10mm (0.390)	CN-010M - HBS
7/16	CN-043 - HBS
12mm (0.472)	CN-012M - HBS
1/2	CN-050 - HBS
EURO Style “Long” & “Extra Long” Adjustable Chucks available upon request.	



Accessories

LONG AND RECTANGULAR CHUCKS – TECHNICAL DETAILS

3-7/8" Long Adjustable Chucks

Stud Size	Part #
#6	CM-013
#8	CM-015
#10 & 5mm	CM-018
6mm	CM-006M
1/4	CM-025
5/16	CM-031
8mm	CM-008M
0.330	CM-033
3/8	CM-037
10mm	CM-010M
7/16	CM-043
12mm	CM-012M
1/2	CM-050
9/16	CM-056
5/8	CM-062



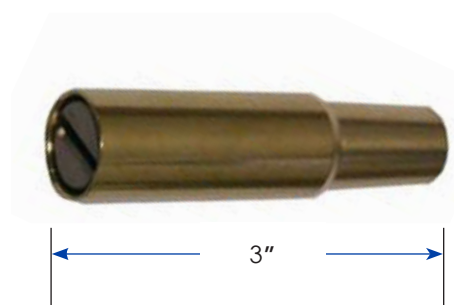
4-3/4" Extra Long Adjustable Chucks

Stud Size	Part #
#6	CL-013
#8	CL-015
#10	CL-018
1/4	CL-025
5/16	CL-031
3/8	CL-037
7/16	CL-043
1/2	CL-050
5/8	CL-062
3/4	CL-075



Rectangular Chucks

Stud Size	Part #
1/8 X 1/4	CR-CA
1/8 X 3/8	CR-CB
1/8 X 5/8	CR-CC
1/8 X 3/4	CR-CG
1/8 X 7/8	CR-CH
1/8 X 1"	CR-CE
1/4 X 3/4	CR-CF
1/4 X 1-1/4	CR-CJ



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Accessories

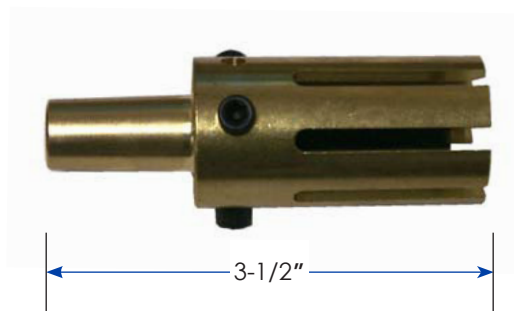
HEADED STUD CHUCKS – TECHNICAL DETAILS

3/8" Dia. Headed Anchor Chuck (3/4" Dia. Head)

Part #	Description
CH-037	Complete Assy.
CH-037-1	Sleeve Only
CH-037-2	Base Only
CH-037-3	Stop Screw
SCREWS	10-32 X 3/8

1/2" Dia. Headed Anchor Chuck (1" Dia. Head)

Part #	Description
CH-050	Complete Assy.
CH-050-1	Sleeve Only
CH-050-2	Base Only
CH-050-3	Stop Screw

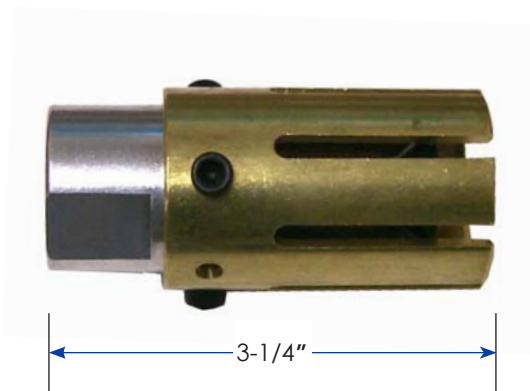


5/8 & 3/4 Dia. Headed Anchor Chuck (1-1/4" Dia. head)

Part #	Description
CH-075	Complete Assy.
CH-075-1	Sleeve Only
CH-075-2	Base Only
CH-075-3	Stop Screw

7/8 Dia. Headed Anchor Chuck (1-3/8" Dia. Head)

Part #	Description
CH-087	Complete Assy.
CH-087-1	Sleeve Only
CH-087-2	Base Only
CH-087-3	Stop Screw



1" Dia. Headed Anchor Chuck (1-5/8" Dia. Head)

Part #	Description
CH-100	Complete Assy.
CH-100-1	Sleeve Only
CH-100-2	Base Only
CH-100-3	Stop Screw
SCREWS	10-32 X 1/2

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Accessories

SPECIAL CHUCKS / LEGS – TECHNICAL DETAILS



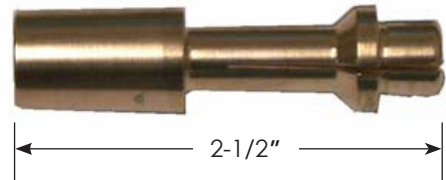
Y Anchor Chucks	
Anchor Size	Part #
3/16	CY-018
1/4	CY-025
5/16	CY-031



Bent Stud Chuck		
Stud Dia.	Bend	Part #
3/8	90 Degree	CB-037-90
3/8	45 Degree	CB-037-45
1/2	90 Degree	CB-050-90
1/2	45 Degree	CB-050-45
5/8	90 Degree	CB-062-90
5/8	45 Degree	CB-062-45
3/4	90 Degree	CB-075-90
3/4	45 Degree	CB-075-45



Arc Stud Welding Legs		
Length	Diameter	Part #
7"	5/16	L-03107
9"	5/16	L-03109
14"	5/16	L-03114
18"	5/16	L-03118
24"	5/16	L-03124
27"	5/16	L-03127
7"	3/8	L-03707
9"	3/8	L-03709
14"	3/8	L-03714
18"	3/8	L-03718
24"	3/8	L-03724
27"	3/8	L-03727
32"	3/8	L-03732
36"	3/8	L-03736
48"	3/8	L-03748
5/16 Leg Washer		LW-031
5/16 Leg Screw		LS-031
3/8 Leg Washer		LW-037
3/8 Leg Screw		LS-037



Male Chucks	
Hole Size	Part No.
8-32	CX-008-32
10-24	CX-010-24
10-32	CX-010-32
1/4-20	CX-025-20
5/16-18	CX-031-18
3/8-16	CX-037-16
1/2-13	CX-050-13
5/8-11	CX-062-11
3/4-10	CX-075-10
1/4	CX-025
3/8	CX-037
1/2	CX-050
5/8	CX-062

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Accessories

WELD THRU DECK ACCESSORIES



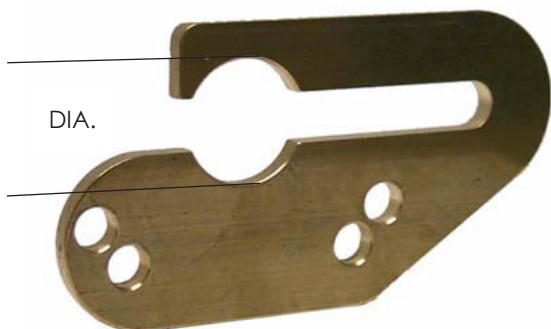
**Weld Thru Deck (WTD)
Foot Assembly**

Part #	Description
B-0021	Foot Assy.
B-0021-1	Foot Only
B-0021-2	Extension Bar
B-0021-3	1/4-20 X 1" Screws



Weld Thru Deck Ferrule Holder

Part #	Description
B-0060-1	3/4 WTD & 7/8 Flat
B-0060-2	3/4 Flat
B-0060-3	5/8 Flat
B-0060-4	1" Flat
B-0060-5	1/2 Flat



Refractory Ferrule Foot Plate

Part #	Neck Dia.
QY-025-1	.810
QY-025-2	.930
QY-025-3	1.030



Heavy Duty Ferrule Grip

Part #	Stud Dia.
GH-050	1/2
GH-062	5/8
GH-075	3/4
GH-087	7/8
GH-100	1"

Accessories

CLOSED FEET – TECHNICAL DETAILS



B-1N



B-2N



B-3N



B-6N/B-7N



B-4N/B-5N



028-833

Standard Closed Feet		
Gun Type	Stud Size	Part #
ARC Guns - For use with ferrule grips		
USA LD & MD	1/8-1/2"	B-1N
USA HD	1/8-1/2"	B-1N
NS-30 & NS-40	1/8-1/2"	B-6N
EURO LD	1/8-1/2"	H-1N
EURO LD (Alum.)	1/8-1/2"	H-1N-I
USA LD & MD	5/8-3/4"	B-2N
USA HD	5/8-3/4"	B-2N
NS-30 & NS-40	5/8-3/4"	B-7N
EURO MD	5/8-3/4"	H-2N
USA HD	7/8-1"	B-3N
BANTAM A-58	1/8-1/2"	B-4N
BANTAM A-58	5/8-3/4"	B-5N
CD Guns - For use with or without a spark shield		
USA CD FOOT	1/8-3/8"	028-833
EURO CD FOOT	1/8-3/8"	H-2N

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Accessories

SPLIT FEET – TECHNICAL DETAILS



B-1C



B-2C



B-3C



B-6C/B-7C



B-4C/B-5C



B-4CR/B-5CR

Standard Split Feet		
Gun Type	Stud Size	Part #
ARC Guns - For use with ferrule grips		
USA LD & MD	1/8-1/2"	B-1C
USA HD	1/8-1/2"	B-1C
NS-30 & NS-40	1/8-1/2"	B-6C
EURO LD	1/8-1/2"	H-1C
USA LD & MD	5/8-3/4"	B-2C
USA HD	5/8-3/4"	B-2C
NS-30 & NS-40	5/8-3/4"	B-7C
EURO MD	5/8-3/4"	H-2C
USA HD	7/8-1"	B-3C
EURO HD	7/8-1"	B-3C
BANTAM A-58	1/8-1/2"	B-4C
BANTAM A-58	5/8-3/4"	B-5C
CD Gun - For use with or without a spark shield		
BANTAM C-2	1/8-3/8"	B-4CR (Recessed)
BANTAM C-2	1/8-3/8"	B-5CR (Recessed)

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Accessories

SPECIAL FEET & FERRULE FOOT PLATES

Closed BI-POD Feet

Gun Type	Stud Size	Part #
USA	1/8-1/2"	BP-1N
USA	5/8-3/4"	BP-2N
USA	7/8-1"	BP-3N



Split BI-POD Feet

Gun Type	Stud Size	Part #
USA	1/8-1/2"	BP-1C
USA	5/8-3/4"	BP-2C
USA	7/8-1"	BP-3C



Twin Leg Ferrule Foot Plate

Stud Size	Part #
1/4	QN-025
5/16	QN-031
3/8	QN-037
1/2	QN-050
5/8	QN-062
3/4	QN-075
7/8	QN-087
1"	QN-100



Single Leg Ferrule Foot Plate

Stud Size	Part #
1/4	QM-025
5/16	QM-031
3/8	QM-037
1/2	QM-050
5/8	QM-062
3/4	QM-075
7/8	QM-087
1"	QM-100



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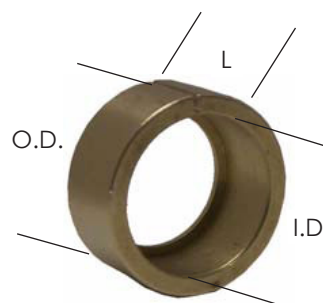
Accessories

SPECIAL ACCESSORIES

Ferrule Tubing				
Stud Size	Part #	I.D.	O.D.	L
#8	MP-015	0.291	0.360	36"
#10	MP-018	0.305	0.375	36"
1/4	MP-025	0.380	0.500	36"
5/16	MP-031	0.445	0.562	36"
3/8	MP-037	0.505	0.625	36"
7/16	MP-043	0.585	0.687	36"
1/2	MP-050	0.650	0.750	36"
5/8	MP-062	0.785	0.906	36"
3/4	MP-075	1.030	1.156	36"



Ferrule Tubing Bushing				
Stud Size	Part #	I.D.	O.D.	Foot Size
#8	MB-015	0.360	0.875	Small
#10	MB-018	0.375	0.875	Small
1/4	MB-025	0.500	0.875	Small
5/16	MB-031	0.562	0.875	Small
3/8	MB-037	0.625	0.875	Small
7/16	MB-043	0.687	0.875	Small
1/2	MB-050	0.750	0.875	Small
5/8	MB-062	0.906	1.156	Medium
3/4	Not required			Medium



Gas Adapter Feet For Aluminum & Short Cycle Welding



PART # BG-1

Use with Ferrule
USA Gun Type



PART # BG-2

BG-2-1	Foot Only
BG-2-2	Spark Shield Only
BG-2-3	Valve Assly.
Use without Ferrule	
USA Gun Type	



PART # BG-3

BG-3-1	Foot Only
BG-3-2	Spark Shield Only
119-0010	Hose Connector
BG-3-XXX	Gas Insert

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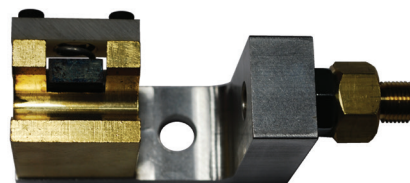
PSR STUD ACCESSORIES

Side Load Chucks			
	Chuck Only	Short Brkt	Long Brkt
Stud Size	Part #	Part #	Part #
3/8	CSLB-037	CSL-037S	CSL-037L
1/2	CSLB-050	CSL-050S	CSL-050L
5/8	CSLB-0562	CSL-062S	CSL-062L
3/4	CSLB-075	CSL-075S	CSL-075L

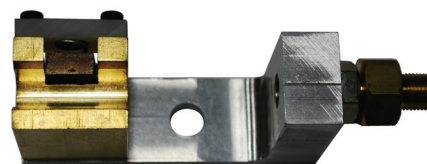
Side Load Chuck Components	
Component	Part #
Hold Down Finger 3/8, 1/2 & 5/8 Chucks	CSLF
Hold Down Finger 3/4 Chuck	CSLF750
Chuck Isolator	CSLN
Chuck Spring	CSLS
Long Bracket	CSLA-1
Short Bracket	CSLA-2

PSR Twin Leg Ferrule Foot Plate	
Stud Size	Part #
3/8	QNW-037
1/2	QNW-050
5/8	QNW-062
3/4	QNW-075

Other Needed Accessories	
Component	Part #
Leg Widener	CLSX
Leg Widener - Special	CLSX-S
3/8 X 9" Legs (2 pcs.) Gun to Leg Widener	L-03709
Legs (2 pcs.) Leg Widener To Foot Plate	-A)
(A- length to be determined based on stud length. See ARC Stud Welding Legs for stock lengths.	



SHORT
VERSION



LONG
VERSION



QNW



CLSX



CLSX-S

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CAPACITOR DISCHARGE ACCESSORIES

"B" Collets - Standard

Stud Dia.	Part #
3mm	CDB-003M
1/4 GA	CDB-008
1/2 GA & #4	CDB-010
3/8 & #5	CDB-012
10 GA & #6	CDB-013
4mm	CDB-004M
#8	CDB-015
#10	CDB-018
5mm	CDB-005M
0.215	CDB-021
6mm	CDB-006M
1/4	CDB-025
5/16	CDB-031
8mm	CDB-008M
3/8	CDB-037
10mm	CDB-010M



"B" Collets - Short

Stud Dia.	Part #
1/4 GA	CDB-008A
1/2 GA	CDB-010A
#6	CDB-013A
#8	CDB-015A
#10	CDB-018A
1/4	CDB-025A



"B" Stop - For Use With Above "B" Collets

Stud Length	Stop Length	Part #
1/4	1-1/4	033-781
3/8	1-1/8	033-782
1/2	1"	033-783
5/8	7/8	033-784
3/4	3/4	033-785
7/8	5/8	033-775
1"	1/2	033-776
1-1/8	3/8	033-777
1-1/4	1/4	033-778
1-3/8 (Button Stop)	1/8	033-779
UNIVERSAL		033-780



Short Button Stop



Universal "B" Stop

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Accessories

CAPACITOR DISCHARGE ACCESSORIES

Euro Collets - 2 Part Assembly

Stud Dia.	Part #
2mm (0.79)	CDBS-002M
#4 & 12 GA.	CDBS-010
3mm (0.116)	CDBS-003M
#6 & 10GA.	CDBS-013
4mm	CDBS-004M
#8	CDBS-015
#10	CDBS-018
5mm (0.196)	CDBS-005M
6mm (0.234)	CDBS-006M
1/4	CDBS-025
5/16	CDBS-031
8mm (0.313)	CDBS-008M
3/8	CDBS-037
10mm	CDBS-010M



Euro Collets - 3 Part Assembly

Stud Dia.	Part #
2mm (0.79)	CDBHBS-002M
#4 & 12 GA.	CDBHBS-010
3mm (0.116)	CDBHBS-003M
#6 & 10GA.	CDBHBS-013
4mm	CDBHBS-004M
#8	CDBHBS-015
#10	CDBHBS-018
5mm (0.196)	CDBHBS-005M
6mm (0.234)	CDBHBS-006M
1/4	CDBHBS-025
5/16	CDBHBS-031
8mm (0.313)	CDBHBS-008M
3/8	CDBHBS-037
10mm	CDBHBS-010M



Accessories

CAPACITOR DISCHARGE ACCESSORIES

B Collets - Long		
Stud Size	Part #	Cross Ref.
#6	CDBN-013	500-001-356
#8	CDBN-015	500-001-357
#10	CDBN-018	500-001-366
1/4	CDBN-025	500-001-359
5/16	CDBN-031	500-001-360
4 mm	CDBN-004M	500-001-361
6 mm	CDBN-006M	500-001-362
12 GA & #4	CDBN-010	500-001-363



Long Style Adj. Stops For Above		
Stud Length	Part #	Cross Ref.
1/4 TO 5/8	CDBNS-062	500-017-017
3/4 TO 1-1/8	CDBNS-113	500-017-018
1-1/4 TO 1-5/8	CDBNS-162	500-017-019
1-3/4 TO 2-1/8	CDBNS-213	500-017-020
Insulator Only	CDBNS-1	500-017-025



KSM / ERICO	Air Collet
Bottom Load	
Stud Dia.	Part #
#4 (.112)	016-412
#6 (.138)	016-415
#8 (.164)	016-416
#10 (.189)	016-417
1/4 (.250)	016-418

Ram Feed	
Stud Dia.	Part #
#4 (.112)	025-016
#6 (.138)	025-017
#8 (.164)	025-018
#10 (.189)	025-019
1/4 (.250)	025-020

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CAPACITOR DISCHARGE ACCESSORIES

Collets Inserts For Weld Pins	
Stud Dia. X Depth	Part #
1/2 GA X 1/2	CIP-010-050
1/2 GA X 3/4	CIP-010-075
1/2 GA X 1"	CIP-010-100
10 GA X 1/2	CIP-014-050
10 GA X 3/4	CIP-014-075



Collets Inserts For Weld Studs			
Stud Dia. X Depth	Part #	Stud Dia. X Depth	Part #
#4 X 1/4	CI-010-025	#10 X 1/4	CI-018-025
#4 X 3/8	CI-010-037	#10 X 3/8	CI-018-037
#4 X 1/2	CI-010-050	#10 X 1/2	CI-018-050
#4 X 1"	CI-010-100	#10 X 5/8	CI-018-062
#6 X 1/4	CI-013-025	#10 X 3/4	CI-018-075
#6 X 3/8	CI-013-037	#10 X 1"	CI-018-100
#6 X 1/2	CI-013-050	1/4 X 1/4	CI-025-025
#6 X 5/8	CI-013-062	1/4 X 3/8	CI-025-037
#6 X 3/4	CI-013-075	1/4 X 1/2	CI-025-050
#6 X 1"	CI-013-100	1/4 X 5/8	CI-025-062
10 GA X 1/2	CI-014-050	1/4 X 3/4	CI-025-075
10 GA X 3/4	CI-014-075	1/4 X 1"	CI-025-100
10 GA X 1"	CI-014-100	5/16 X 3/8	CI-031-037
#8 X 1/4	CI-015-025	5/16 X 1/2	CI-031-050
#8 X 3/8	CI-015-037	5/16 X 5/8	CI-031-062
#8 X 1/2	CI-015-050	5/16 X 3/4	CI-031-075
#8 X 5/8	CI-015-062	5/16 X 1"	CI-031-100
#8 X 3/4	CI-015-075	3/8 X 1/2	CI-037-050
#8 X 1"	CI-015-100	3/8 X 3/4	CI-037-075
		3/8 X 1"	CI-037-100



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Accessories

CAPACITOR DISCHARGE ACCESSORIES

One Piece Contact / Magnetic Chuck

Part #	Description
039-613	Magnetic Chuck - 1 Piece, B Collet Gun
039-613-I	Magnetic Chuck - 1 Piece, Euro Gun



Magnetic Chuck - "B" Collet Gun

Part #	Description
035-301	Complete Assy.
017-633	Magnet Only
029-615	Conductor Plate
039-609	Insul. Tube
039-610	Insul. Disc
Screw	10-32 X 7/8



"B" Collet Protector

Part #	Stud Size
028-837	14 GA X 12 GA
028-838	10 GA
028-836	Body Only
028-834-I	14 GA Insert
028-834	12 GA Insert
028-835	10 GA Insert



Accessories

CAPACITOR DISCHARGE ACCESSORIES

Standard Spark Shield

Part #	Stud Range
033-764	10 GA. - #6
033-765	#8 - 3/8



Vented Spark Shield

Part #	Stud Range
033-769	10 GA. - #6
033-769L	#8 - 3/8
033-769-B	#8 - 3/8, Brass Mat.

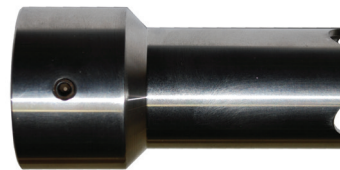


Template Tube Adaptor

Part #	Template I.D.
039-838	1" Dia.
039-840	1-1/4" Dia.
80-40-513	30mm (Euro Gun)



039-838

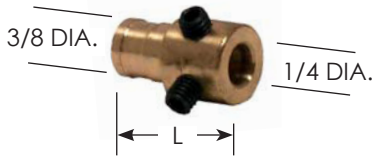


80-40-513

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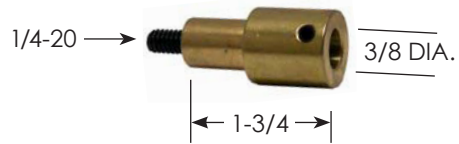
Accessories

ADAPTORS



B-CI Adaptors

Part #	Description
044-082	7/8 Long
033-746	1-9/16 Long



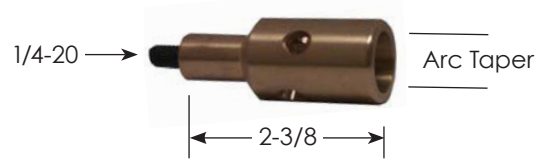
K-B Adaptor

Part #	Description
039-464	1 - 3/4 Long



B-N Adaptor

Part #	Description
039-468	1 - 7/8 Long



K-N Adaptor

Part #	Description
033-750	2 - 3/8 Long



Tapered Base Adaptor

Part #	I.D.
044-083 N-B	3/8 ID
044-084 N-C	1/4 ID



Threaded Tapered Adaptor

Part #	Description
MT-0003	1/2-20 Thread

Accessories

ADAPTORS

Miscellaneous Adaptors	
Part #	Description
033-505	Chuck Adaptor Erico HD & MD
033-505T	Chuck Adaptor - NEW STYLE
033-506	Connector Stud HD & MD
302-0026	AG Style Chuck Adaptor LD
751-458-049	NS-30 Chuck Adaptor
82-01-84	NS-40 Chuck Adaptor
83-50-012-1	EURO Chuck Adaptor HD & MD
80-05-689	EURO Connector Stud HD & MD
033-505L	L-TEC Chuck Adaptor
033-601	EURO Gun - B Collet Adaptor (Long)
033-601-S	EURO Gun - B Collet Adaptor (Short)
033-749	K-CI Adaptors



033-505T



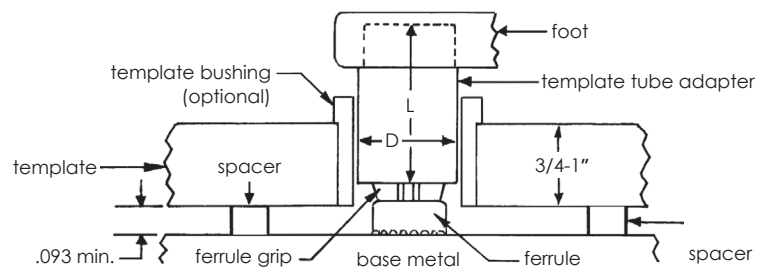
033-504



033-506

Arc Template Tube Adaptors	
Part #	Description
MT-0008	Under 1/2" Dia., AOL 2", D 1.250 A
MT-0012	5/8 TO 3/4 Dia., AOL 2.5", D 1.562 A
MT-0016	7/8 TO 1 Dia., AOL 2.5", D 2.125 A
92-40-051	Assy., 30MM O.D., L - 34MM B
92-41-051	Assy., 30MM O.D., L - 48MM B
92-42-051	Assy., 30MM O.D., L - 58MM B
80-40-737	Nozzle Only, 30MM, L - 34MM B
80-41-737	Nozzle Only, 30MM, L - 48MM B
80-42-737	Nozzle Only, 30MM, L - 58MM B
A	For use with ceramic ferrule on any gun
B	For use with gas on Euro ARC Guns

BLUSHING METHOD



92-4X-051

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Accessories

CONTROL CABLE CONNECTORS



107-0015



107-0014



107-0001

Control Cable Connector - 4 & 6 Pole		
Part #	Description	Style
107-0014	MALE 4 Pole Connector	Old
107-0015	FEMALE 4 Pole Connector	Old
107-0001	PANEL Mount Connector	Old
107-1014	MALE 4 Pole Connector	New
107-1015	FEMALE 4 Pole Connector	New
107-1001	PANEL Mount Connector	New
107-2014	MALE 6 Pole Connector	Euro
107-2015	FEMALE 6 Pole Connector	Euro
107-2001	Panel Mount Connector	Euro



107-1014



107-1015



Arc 2-Wire



Panel Mount



CD Hubbell (M)

Hubbell Style Connector	
Part #	Description
107-0016	ARC 2-Wire (M)
107-0017	ARC 2-Wire (F)
107-0018	ARC 2-Wire (Panel Mount)
107-0019	(M) Rubber Cover
107-0020	(F) Rubber Cover
107-0030	CD Hubbell (M)
107-0032	CD Hubbell (F)
107-0031	CD Hubbell (Panel Mount)

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Accessories

WELD CABLE CONNECTORS



Heavy Duty Hi Temp Camlok Connectors

Part #	Description	Part #	Description
I07-0006	4/O (M) HI Temp	I07-0007	4/O (F) HI Temp
I07-0006-1	4/O (M) Sleeve	I07-0007-1	4/O (F) Sleeve
I07-0006-2	4/O Brass Only	I07-0007-2	4/O Brass Only
I07-0007-MF	HI Temp Pin - Fits (M) OR (F)	I07-0007-MF	HI Temp Pin - Fits (M) OR (F)
I07-0007-CW	Copper Wrap - Fits (M) OR (F)	I07-0007-CW	Copper Wrap - Fits (M) OR (F)



Light Duty Connector

Part #	Description
I07-0010	I/O (M) with Fiber Shell
I07-0011	I/O (F) with Fiber Shell
I07-0012	#4 (M) with Fiber Shell

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Accessories

WELD CABLE CONNECTORS

Panel Mount Camlok Connectors

Part #	Description
107-0003	Male Panel Mount
107-0002	Female Panel Mount



Weld Cable Lugs

Part #	Description
123-0003	#4 with #10 Hole
123-0001	#1 with #10 Hole
123-0006	#1 with 1/4 Hole
123-0002	#1 with 3/8 Hole
123-0008	1/O with 3/8 Hole
123-0009	1/O with 1/2 Hole
123-0013	4/O with 3/8 Hole
123-0010	4/O with 1/2 Hole



ALLEN WRENCH & CHUCK EJECTOR

Accessories

Part #	Description
102-0041	Allen Wrench Set - Imperial
102-0041-M	Allen Wrench Set - Metric
102-0042	Chuck Ejector Key



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SECTION 13

STUD WELDING EQUIPMENT

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

OFFICE: 216.904.4008

EMAIL: SALES@COMPLETESTUDWELD.COM

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SECTION 13

STUD WELDING – RENTAL EQUIPMENT

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Stud Welding Equipment

RENT STUD WELDERS

Complete Stud Welding has CD, ARC and Short Cycle stud welders available for rent to satisfy all applications.

Common stud types / applications are listed below:

CD Applications:

- CD Threaded Studs
- CD Non Threaded Studs
- CD Tap Studs
- CD Cable Tie Bases
- CD Weld Pins
- Insulation Pins
- Power Point Pins
- Cupped Head Pins
- Tap studs

ARC Applications:

- Headed Concrete Anchors
- Headed Shear Connectors
- Weld Thru Deck
- Deformed Bar Anchors
- Threaded Weld Studs
- Non Threaded Weld Studs
- Boiler Tube Pins
- Rectangular Weld Studs
- Collar Studs
- Shoulder Studs

Short Cycle (SC) Applications:

- SC & CD Studs all types
- SC Collar Studs

We accept most major credit cards or we can assist with the credit approval process.

We have a full line of weld studs and accessories to go with your Stud Welder Rental!

For personnel assistance **call (216)904-4008** or email **Sales@completestudweld.com**.
We have the expertise to determine the right equipment for your needs!

COMPLETE STUD WELDING

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SECTION 13

STUD WELDING EQUIPMENT PROCESS & CAPABILITY SUMMARY

CD EQUIPMENT • ARC EQUIPMENT • SHORT CYCLE EQUIPMENT

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

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EMAIL: SALES@COMPLETESTUDWELD.COM

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website www.completestudweld.com e-mail sales@completestudweld.com
32035 Creekside Drive, Cleveland, Ohio 44124 fax 216.378.0349 telephone 216.904.4008

Stud Welding Equipment - New

EQUIPMENT PROCESS AND CAPABILITY SUMMARY

Model Designation	Page Number	Automation	Maximum Capacity By Stud Diameter			Comments
			CD	ARC	Short Cycle	
TWP 2	13.6		3/16"			Great Pin Welder
TWE 250	13.7		1/4"			Contact & Gap availability
TWE 321	13.8		5/16"			Contact & Gap availability
TWE 375	13.9		3/8"			Contact & Gap availability
TWE 250SPC	13.10		1/4"			Contact & Gap availability
TWE 321 SPC	13.10		5/16"			Contact & Gap availability
TWE 375 SPC	13.10		3/8"			Contact & Gap availability
CDi 1502	13.11		1/4"			Contact & Gap availability
CDi 2302	13.12		5/16"			Contact & Gap availability
CDi 3102	13.13		3/8"			Contact & Gap availability
CI 03	13.14		12 gauge pins			CD Contact Gun
C 08	13.15		3/8"			CD Contact Gun
CA 08	13.16		3/8"			CD Gap Gun
SC900	13.17			1/2"	7/16"	Single Gun System
SC1400	13.18			5/8"		Single Gun System
SC1600	13.19			3/4"		Single Gun System
SC1900	13.20			7/8"		Single Gun System
SC2400	13.21			1"		Single Gun System
SC2402	13.22			1"		Single Gun System 50 Hz
SC2420	13.23			1"		Dual Gun System
SC3400	13.24			1.25"		Single Gun System
SC3402	13.25			1.25"		Dual Gun System
Generator	13.26			1.25"		Field Stud Welding System
TWE 19000	13.27			1/2"	1/2"	ARC Stud Welding Gun
TWE 18500	13.28			5/8"		ARC Stud Welding Gun
TWE 17000	13.29			1.25"		ARC Stud Welding Gun
ARC 500	13.30			7/16"	3/8"	Single Gun System
ARC 800	13.31	Optional		1/2"	7/16"	Single Gun System
IT 1002	13.32	Optional		1/2"	1/2"	Single Gun System
ARC 1550	13.33	Optional		3/4"	1/2"	Single Gun System
IT 2002	13.34	Optional		1"	5/8"	Single Gun System
IT 130	13.35			1"	5/8"	Single Gun System
IT 3002	13.36			1"	5/8"	Single or Dual Gun System
AI 06	13.37			1/4"		ARC Stud Welding Gun
A 12	13.38			1/2"	1/2"	ARC Stud Welding Gun
A 16	13.39			5/8"	5/8"	ARC Stud Welding Gun
A 22	13.40			7/8"		ARC Stud Welding Gun
A 25	13.41			1"		ARC Stud Welding Gun
SC 2401	13.42				3/16"	Short Cycle System
Auto Feed Equipment	13.43					
CDMI 2402	13.44					Power Supply
CDM 3201	13.47	Automation	3/8"			Power Supply
IT 50	13.50	Automation		5/8"	1/2"	Power Supply
IT 90	13.51	Automation		1"	5/8"	Power Supply
KAH 412 LA	13.52	Automation	3/8"	1/2"	1/2"	Weld Head
KAH 412	13.53	Automation	3/8"	1/2"	1/2"	Weld Head
PAH-1	13.54	Automation	5/16"		5/16"	Weld Gun
VBZ-3	13.55	Automation	5/16"	5/16"	5/16"	Stud Feeder
PMB-LS2	13.56	Automation				Pneumatic Clamp
PMB-S	13.57	Automation				Pneumatic Clamp
CNC Systems	13.58					
PC-S	13.59	Automation	1/2"	1/2"	1/2"	
MPW 1010	13.60	Automation	1/2"	1/2"	1/2"	
MPW 2010	13.60	Automation	1/2"	1/2"	1/2"	
Other:						
MARC 3 - PAD Welding System	13.61			1.26"		Specialized PAD Welding System

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Stud Welding Equipment - CD

TWP 2 CAPACITOR DISCHARGE PIN WELDER



Pin Welder Description

Incorporates the latest solid state technology into a compact and rugged, portable CD Pin Welder. This system has the capacity to weld pins (including Cup Head pins) up to 10-gauge and CD Studs up to #10.

SPECS	TWE-PIN WELDER
SIZE	12.5" L x 10.1" W x 6.0" H (315mm x 255mm x 150mm)
WEIGHT	Approx. 12.5 lbs.
WELD RANGE	Weld Pins - Up to 10 gauge CD Studs - Up to #10 Cup Head Pins
DUTY CYCLE	16-20 pins per minute
PRIMARY POWER	110 VAC @ 50/60Hz 15 Amp circuit 220 VAC @50/60Hz 7.5 Amp circuit
CHARGE VOLTAGE	35-110 VDC

Operational and Safety Features

- LED Voltage Meter
- Safety Shutdown
- Cooling Fan
- Front-Panel Informational LED's
- Dial-Down weld voltage control

Made In the USA

Version 1.4 4/25/2011

** Specifications are subject to change without prior notice

FEATURES

- Digital DC voltage readout (allows for more accurate and repeatable weld settings).
- Cooling fan for increased efficiency.
- Dial-down DC voltage setting (no need to turn off the unit when resetting to a lower voltage).
- Only 15 amp circuit requirement (unit fused @ 15 amps).
- Terminal connections on the capacitor are over 5/8" in diameter for a good seat of the terminal buss bars to increase reliability.
- The terminal connections on the capacitor have 1/4-28 socket set screws inserted into each one. The socket set screw is used to make the connection to the buss bar. This eliminates damaging the threads in the aluminum connectors of the capacitor, ensuring a solid connection.
- Rigid internal construction connecting the entire internal unit to the front and rear panels minimizes the opportunity of the components coming loose during handling or operations.
- The TWE-Pin Welder is mounted in a rugged outer case for greater durability, texture, and appearance.
- The TWE-Pin Welder weighs less than 13 pounds for ease of carrying.
- Stud Guns are ergonomically designed for better hand fit and comfort (reduces operator fatigue for increased weld repeatability).
- Stud Guns have a permanent internal spring with easy adjustment for various spring pressures allowing an increased opportunity to apply the correct spring pressure to the weld (no need for a variety of different springs for various applications).
- Stud Guns can be configured for "B" Collets, "CI" Collets, Euro Collets or standard tapered chucks.

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Stud Welding Equipment - CD

TWE 250 CAPACITOR DISCHARGE STUD WELDER



Stud Welder Description

Incorporates the latest solid state technology into a compact and rugged CD Stud Welder. This system has the capacity to weld studs and pins (including cupped head pins) ranging from 14-gauge through 1/4" full flanged stainless steel studs.

SPECS	TWE-250
SIZE	16" Length, 8-1/2" Width, 9" Height
WEIGHT	28 lbs.
WELD RANGE	14 gauge through 1/4" Stainless
DUTY CYCLE	30 studs per minute (including 1/4")
PRIMARY POWER	110 VAC @ 50/60Hz 10 Amp circuit or 220 VAC @50/60Hz 5 Amp circuit
CHARGE VOLTAGE	35-200 VDC

Operational and Safety Features

- LED Voltage Meter
- Safety Shutdown
- Cooling Fan
- Front-Panel Informational LED's
- Dial-Down weld voltage control

Made In the USA

** Specifications are subject to change without prior notice

Version 2.0 05/09/2013

FEATURES

- Digital DC voltage readout on all models (allows for more accurate and repeatable weld settings).
- Cooling fan in all models for increased efficiency.
- Dial-down DC voltage setting (no need to turn off the unit when resetting to a lower voltage).
- Only 10 amp circuit requirement (unit fused @ 10 amps).
- 66,000 micro farad capacitors charging to 200 VDC for greater power output @ lower DC voltage requirements.
- Terminal connections on the capacitors are over 5/8" in diameter for a good seat of the terminal buss bars to increase reliability.
- The terminal connections on the capacitors have 1/4-28 socket set screws inserted into each one. The socket set screw is used to make the connection to the buss bar. This eliminates damaging the threads in the aluminum connectors of the capacitor, ensuring a solid connection.
- Rigid internal construction connecting the entire internal unit to the front and rear panels minimizes the opportunity of the components coming loose during handling or operations.
- Sheet metal is powder-coated for greater durability, texture, and appearance.
- Stud Guns are ergonomically designed for better hand fit and comfort (reduces operator fatigue for increased weld repeatability).
- Stud Guns have a permanent internal spring with easy adjustment for various spring pressures allowing an increased opportunity to apply the correct spring pressure to the weld (no need for a variety of different springs for various applications).
- Stud Guns can be configured for "B" Collets, "CI" Collets, Euro Collets or standard tapered chucks.

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32035 Creekside Drive, Cleveland, Ohio 44124 fax 216.378.0349 telephone 216.904.4008

Stud Welding Equipment - CD

TWE 321 CAPACITOR DISCHARGE STUD WELDER



Stud Welder Description

Incorporates the latest solid state technology into a compact and rugged CD Stud Welder. This system has the capacity to weld studs and pins (including cupped head pins) ranging from 14-gauge through 5/16" full flanged stainless steel studs.

SPECS	TWE-321
SIZE	16" Length, 8-1/2" Width, 9" Height
WEIGHT	31 lbs.
WELD RANGE	14 gauge through 5/16" Stainless
DUTY CYCLE	30 studs per minute (including 5/16")
PRIMARY POWER	110 VAC @ 50/60Hz 10 Amp circuit or 220 VAC @50/60Hz 5 Amp circuit
CHARGE VOLTAGE	35-200 VDC

Operational and Safety Features

- LED Voltage Meter
- Safety Shutdown
- Cooling Fan
- Front-Panel Informational LED's
- Dial-Down weld voltage control

Made In the USA

** Specifications are subject to change without prior notice

Version 2.0 05/09/2013

FEATURES

- Digital DC voltage readout on all models (allows for more accurate and repeatable weld settings).
- Cooling fan in all models for increased efficiency.
- Dial-down DC voltage setting (no need to turn off the unit when resetting to a lower voltage).
- Only 10 amp circuit requirement (unit fused @ 10 amps).
- 99,000 micro farad capacitors charging to 200 VDC for greater power output @ lower DC voltage requirements.
- Terminal connections on the capacitors are over 5/8" in diameter for a good seat of the terminal buss bars to increase reliability.
- The terminal connections on the capacitors have 1/4-28 socket set screws inserted into each one. The socket set screw is used to make the connection to the buss bar. This eliminates damaging the threads in the aluminum connectors of the capacitor, ensuring a solid connection.
- Rigid internal construction connecting the entire internal unit to the front and rear panels minimizes the opportunity of the components coming loose during handling or operations.
- Sheet metal is powder-coated for greater durability, texture, and appearance.
- Stud Guns are ergonomically designed for better hand fit and comfort (reduces operator fatigue for increased weld repeatability).
- Stud Guns have a permanent internal spring with easy adjustment for various spring pressures allowing an increased opportunity to apply the correct spring pressure to the weld (no need for a variety of different springs for various applications).
- Stud Guns can be configured for "B" Collets, "CI" Collets, Euro Collets or standard tapered chucks.

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Stud Welding Equipment - CD

TWE 375 CAPACITOR DISCHARGE STUD WELDER



Stud Welder Description

Incorporates the latest solid state technology into a compact and rugged CD Stud Welder. This system has the capacity to weld studs and pins (including cupped head pins) ranging from 14-gauge through 3/8" full flanged stainless steel studs.

SPECS	TWE-375
SIZE	16" Length, 8-1/2" Width, 9" Height
WEIGHT	34 lbs.
WELD RANGE	14 gauge through 3/8" Stainless
DUTY CYCLE	30 studs per minute (including 3/8")
PRIMARY POWER	110 VAC @ 50/60Hz 10 Amp circuit or 220 VAC @ 50/60Hz 5 Amp circuit
CHARGE VOLTAGE	35-200 VDC

Operational and Safety Features

- LED Voltage Meter
- Safety Shutdown
- Cooling Fan
- Front-Panel Informational LED's
- Dial-Down weld voltage control

Made In the USA

** Specifications are subject to change without prior notice

Version 2.0 05/09/2013

FEATURES

- Digital DC voltage readout on all models (allows for more accurate and repeatable weld settings).
- Cooling fan in all models for increased efficiency.
- Dial-down DC voltage setting (no need to turn off the unit when resetting to a lower voltage).
- Only 10 amp circuit requirement (unit fused @ 10 amps).
- 132,000 micro farad capacitors charging to 200 VDC for greater power output @ lower DC voltage requirements.
- Terminal connections on the capacitors are over 5/8" in diameter for a good seat of the terminal buss bars to increase reliability.
- The terminal connections on the capacitors have 1/4-28 socket set screws inserted into each one. The socket set screw is used to make the connection to the buss bar. This eliminates damaging the threads on the aluminum connectors of the capacitor, ensuring a solid connection.
- Rigid internal construction connecting the entire internal unit to the front and rear panels minimizes the opportunity of the components coming loose during handling or operations.
- Sheet metal is powder-coated for greater durability, texture, and appearance.
- Stud Guns are ergonomically designed for better hand fit and comfort (reduces operator fatigue for increased weld repeatability).
- Stud Guns have a permanent internal spring with easy adjustment for various spring pressures allowing an increased opportunity to apply the correct spring pressure to the weld (no need for a variety of different springs for various applications).
- Stud Guns can be configured for "B" Collets, "CI" Collets, Euro Collets or standard tapered chucks.

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Stud Welding Equipment - CD

CAPACITOR DISCHARGE STUD WELDER SPECIAL PACKAGE



Product Description

The TWE-SPC Package incorporates the latest solid state technology of our CD Welders into a compact and rugged mobile capacitor discharge unit. This special packaging is available for all of our Capacitor Discharge Welders - The TWE-250, TWE-321, TWE-375.

TWE-250SPC

TWE-321SPC

TWE-375SPC

Operational and Safety Features

LED Voltage Meter

Safety Shutdown

Cooling Fan

Front-Panel Informational LED's

Dial-down weld voltage control

Storage space for weld gun and cable

Ease of transport due to extension handle and wheels.

Stud Welding Equipment - CD

CDI 1502 TECHNICAL DATA SHEET



Inverter-Capacitor Charging Technology

Maximum welding rates
Minimum energy consumption
Minimum weight
Maximum efficiency

Only power unit in its class (66.000 μ F), which officially fulfills the requirements of the Technical Bulletin 0903 „Capacitor-discharge stud welding with tip ignition“ for studs diameter M8 with a required charging voltage of 220 V.

CDi 1502

Stud Welding Unit (with digital display)

For CD stud welding (capacitor discharge welding)
according to current standards

Technische Daten

Automatic	Option
Welding range	Studs #4 to 5/16", dia. 14 ga to 5/16"; cupped head pins dia. 14 ga and 12 ga; insulation pins dia. 14 ga and #4 (studs M3 to M8, dia. 2 to 8 mm; cupped head pins dia. 2 and 2.7 mm; insulation pins dia. 2 and 3 mm)
Welding material	Mild steel, stainless steel, aluminum and brass
Welding rate	M3 = 40 studs/min. (Charging voltage 60 V) M8 = 14 studs/min. (Charging voltage 200 V) M8 = 12 studs/min. (Charging voltage 220 V)
Capacitance	66,000 μ F
Welding time	1 to 3 msec
Energy	1,600 Ws
Charging voltage	50 to 220 V (stepless voltage regulation)
Primary power	115 V, 50/60 Hz, 10 AT
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP-code	IP 23 (92-12-1502), IP 21 (92-12-1504)
Dimension L x W x H	15.75" x 8.07" x 9.84" (400 x 205 x 250 mm) without handle
Weight	30.87 lbs (14 kg)
Order No	92-12-1502 92-12-1504 (Automatic)

General Information

Application

- Especially suitable for thin sheets (at least 0.5 mm)
- ISO – especially suitable for fixing heating, ventilation and air-conditioning mats (HVAC)

Process variants

- Contact welding
- Gap welding

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STUD WELDING
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Stud Welding Equipment - CD

CDi 2302 TECHNICAL DATA SHEET



Inverter-Capacitor Charging Technology

Maximum welding rates
Minimum energy consumption
Minimum weight
Maximum efficiency

CDi 2302

Stud Welding Unit (with digital display)

For CD stud welding (capacitor discharge welding)
according to current standards

Technische Daten

Welding range	#4 to 5/16" (7/16" limited), dia. 14 ga to 5/16" (dia. 3/8" limited) (M3 to M8 (M10 limited), dia. 2 to 8 mm (dia. 10 mm limited))
Welding material	Mild steel, stainless steel, aluminum and brass
Welding rate	M3 = 33 studs/min. (Charging voltage 60 V) M8 = 12 studs/min. (Charging voltage 170 V) (M10 = 9 studs/min. (Charging voltage 210 V))
Capacitance	99,000 μ F
Welding time	1 to 3 msec
Energy	2,400 Ws
Charging voltage	50 to 220 V (stepless voltage regulation)
Primary power	115 V, 50/60 Hz, 10 AT
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP-code	IP 23
Dimension L x W x H	18.90" x 8.07" x 9.84" (480 x 205 x 250 mm) without handle
Weight	37.48 lbs (17 kg)
Order No	92-12-2302

General Information

Application

- Especially suitable for thin sheets (at least 0.5 mm)

Process variants

- **Contact welding**
- **Gap welding**

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STUD WELDING
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Stud Welding Equipment - CD

CDI 3102 TECHNICAL DATA SHEET



Inverter-Capacitor Charging Technology

Maximum welding rates
Minimum energy consumption
Minimum weight
Maximum efficiency

CDi 3102

Stud Welding Unit (with digital display)

For CD stud welding (capacitor discharge welding)
according to current standards

Technische Daten

Welding range	#4 to 7/16", dia. #4 to 3/8" (M3 to M10, dia. 3 to 10 mm)
Welding material	Mild steel, stainless steel, aluminum and brass
Welding rate	M3 = 20 studs/min. (Charging voltage 50 V) M8 = 10 studs/min. (Charging voltage 140 V) M10 = 6 studs/min. (Charging voltage 200 V)
Capacitance	132,000 µF
Welding time	1 to 3 msec
Energy	3,200 Ws
Charging voltage	50 to 220 V (stepless voltage regulation)
Primary power	115 V, 50/60 Hz, 10 AT
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP-code	IP 23
Dimension L x W x H	18.90" x 8.07" x 9.84" (480 x 205 x 250 mm) without handle
Weight	39.68 lbs (18 kg)
Order No	92-12-3102

General Information

Application

- Especially suitable for thin sheets (at least 0.5 mm)

Process variants

- **Contact welding**
- **Gap welding**

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Stud Welding Equipment - CD

CI 03 STUD WELDING GUN (FOR INSULATION)



CI 03

Stud Welding Gun (for insulation)
for CD stud welding
according to current standards

Technical Data

Welding range	Cupped head pins dia. 14 ga/12 ga (dia. 2/2.7 mm)
Pin length	0.37" to 6.00" (9.5 to 152.4 mm)
Pin material	Mild steel, stainless steel
Pin type	Cupped head pins
Spring pressure	Adjustable, arresting
Welding cable	32.81' (10 m)
IP-Code	IP 20
Workplace noise level	> 90 dB (A) may occur during welding
Dimension L x W x H	6.89" x 1.97" x 5.71" (175 x 50 x 145 mm) without cable and tripod
Weight	1.54 lbs (0.7 kg) without cable and tripod
Order No.	92-20-254

General Information

Application

- Especially suitable for thin sheets (at least 0.5 mm)
- **ISO** – especially suitable for welding on cupped head pins (for fixing heating, ventilation and air-conditioning mats - HVAC)
- Especially suitable for insulation mats with and without aluminum cover. The cupped head pin has a special tip which permits particularly easy penetration of the insulation materials. Variably adjustable spring pressure allows the stud welding gun to be optimally adjusted to a wide range of material densities
- The fixing method with cupped head pins *replaces* the complex procedure: weld on pin – press mat over pin – affix clip – pinch off or bend over projecting tip

Process variants

- **Contact welding**

Stud Welding Equipment - CD

C 08 STUD WELDING GUN



C 08

Stud Welding Gun
for CD stud welding
according to current standards

Technical Data

Welding range	#4 to 5/16", dia. 14 ga to 5/16" (M3 to M8, dia. 2 to 8 mm) other dimensions on request
Stud length	0.24" to 1.57" (6 to 40 mm); longer studs can be welded with optional accessories
Stud material	Mild steel, stainless steel
Stud type	Any type or shape (special chucks if required)
Spring pressure	Adjustable, arresting
Welding cable	21.33' (6.5 m)
IP-Code	IP 20
Workplace noise level	> 90 dB (A) may occur during welding
Dimension L x W x H	6.70" x 1.57" x 5.51" (170 x 40 x 140 mm) without cable
Weight	1.10 lbs (0.5 kg) without cable
Order No.	92-20-256

General Information

Application

- Especially suitable for thin sheets (at least 0.5 mm)
- **ISO** – especially suitable for welding on insulation pins with flange and ignition tip

Process variants

- **Contact welding**

Advantages

Structure

- Rigid casing made of impact-resistant plastic
- Torsion-resistant basic shell (casing) to accommodate all function elements (e.g. ball bearing guide) and accessories (e.g. foot ring)
- Zero-play ball linear bearing for guiding the welding piston
- Sealed welding piston guidance
- Ergonomic design
- Compact dimensions
- Stud length freely adjustable (up to 40 mm; from 40 mm with tripod)
- Mechanical structure tested in production

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Stud Welding Equipment - CD

CA 08 STUD WELDING GUN



CA 08

Stud Welding Gun
for CD and ARC stud welding
according to current standards

Technical Data	
Welding range	#4 to 5/16", dia. 14 ga to 5/16" (M3 to M8, dia. 2 to 8 mm) other dimensions on request
Stud length	0.24" to 1.57" (6 to 40 mm); longer studs can be welded with optional accessories
Stud material	Mild steel, stainless steel, aluminum, brass
Stud type	Any type or shape (special chucks if required)
Stroke	Adjustment range 0.18" (4.5 mm), lockable
Spring pressure	Adjustable, arresting
Welding cable	9.84' (3 m)
IP-Code	IP 20
Workplace noise level	> 90 dB (A) may occur during welding
Dimension L x W x H	7.48" x 1.57" x 5.51" (190 x 40 x 140 mm) without cable
Weight	1.54 lbs (0.7 kg) without cable
Order No.	92-20-255

General Information

Application

- Especially suitable for thin sheets (at least 0.5 mm)

Process variants

- **Gap welding**
- **Short cycle drawn arc welding**

Advantages

Structure

- Rigid casing made of impact-resistant plastic
- Torsion-resistant basic shell (casing) to accommodate all function elements (e.g. ball bearing guide) and accessories (e.g. foot ring)
- Zero-play ball linear bearing for guiding the welding piston
- Sealed welding piston guidance
- Ergonomic design
- Compact dimensions
- Integrated lift and spring-loaded adjustment
- Stud length freely adjustable (up to 40 mm; from 40 mm with tripod)
- Mechanical structure tested in production

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Stud Welding Equipment - ARC

SC900 STUD WELDING SYSTEM



Made In the USA

DESCRIPTION

The SC900 is a fully integrated stud welding system for ferrule-shielded and gas-shielded drawn arc stud welding. The SC900 contains digital controls for weld time, weld current, and gas purge time. The system was designed to be a perfect fit for shop use, welding up through 1/2" studs. This is all contained in a compact, portable package.

Includes;

800 Amp Power Supply Controller, TWE19000 Light Duty stud gun, 25 feet of #2 AWG combo cable, and 15 feet of #2 AWG ground cable with clamp.

** Specifications are subject to change without prior notice

Version 1.2 05/09/2013

FEATURES

Weld Range	1/8" to 1/2" reduced base	Consistent welding regardless of stud diameter.
Duty Cycle	1/8" through 1/4" - unlimited 3/8" - 5 to 6 per minute 1/2" - 2 to 3 per minute	- Adjustable weld time, weld current, gas purge time for a wide range of process control. - Great short cycle performance on thick and thin base materials. - Two handle lift for practical portability. - Stud Job Counter that can be reset for every job.
Dimensions	Height Width Length Weight	12.6" (320mm) 11" (280mm) 22.4" (570mm) 106 lbs. (48Kg)
Input Voltages		230 / 460 VAC 3-Phase 60Hz
Fusing Requirements	(Slow Acting)	230 / 50 Amps 460 / 25 Amps

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Stud Welding Equipment - ARC

SC1400 STUD WELDING SYSTEM



Made In the USA

DESCRIPTION

The SC1400 is fully integrated stud welding system with digital controls for time and current. This system was designed to be a perfect fit for shop use excelling at small to medium-sized diameter studs, all in a compact, affordable package.

Includes;

1400 Amp Power Supply, TWE18500 Medium Duty stud gun, 35 feet of 2/0 weld and control cable and 25 feet of 2/0 ground cable.

** Specifications are subject to change without prior notice

Version 1.5 2/13/2012

FEATURES

Weld Range	1/4" - 5/8" Diameter	Consistent welding regardless of stud diameter.
Duty Cycle	1/4" Thru 3/8" - Unlimited 1/2" - 22 to 24 per minute 5/8" - 9 to 10 per minute	• Smooth arc curve targeted for small to medium-sized diameter studs. • Enhanced Duty Cycle for production requirements. • Capable of up to 100 feet of 2/0 welding cable accommodates a large variety of work station layouts. • Stepless time and current control allow for infinite settings for fine-tuning the welding output.
Dimensions	Height Width Length Weight	22" (559mm) 25" (635mm) 30" (762mm) 380 Lbs. (172kg)
Input Voltages		230 / 460 / 575 VAC 3 Phase 60Hz
Fusing Requirements	(Slow Acting)	230 / 120 Amps 460 / 60 Amps 575 / 50 Amps

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Stud Welding Equipment - ARC

SC1600 STUD WELDING SYSTEM



Made In the USA

DESCRIPTION

The SC1600 is fully integrated stud welding system with digital controls for time and current. This system was designed to be a perfect fit for shop use excelling at small to medium-sized diameter studs, all in a compact, affordable package.

Includes;

1600 Amp Power Supply, TWE17000 Heavy Duty stud gun, 35 feet of 4/0 weld and control cable and 25 feet of 4/0 ground cable.

** Specifications are subject to change without prior notice

Version 1.5 2/13/2012

FEATURES

Weld Range	1/4" - 3/4" Diameter	Consistent welding regardless of stud diameter.
Duty Cycle	1/4" Thru 3/8" - Unlimited 1/2" - 22 to 24 per minute 5/8" - 9 to 10 per minute 3/4" - 4 to 5 per minute	• Smooth arc curve targeted for small to medium-sized diameter studs. • Enhanced Duty Cycle for production requirements. • Capable of up to 100 feet of 4/0 welding cable accommodates a large variety of work station layouts. • Stepless time and current control allow for infinite settings for fine-tuning the welding output.
Dimensions	Height Width Length Weight	22" (559mm) 25" (635mm) 30" (762mm) 380 Lbs. (172kg)
Input Voltages		230 / 460 / 575 VAC 3 Phase 60Hz
Fusing Requirements	(Slow Acting)	230 / 120 Amps 460 / 60 Amps 575 / 50 Amps

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Stud Welding Equipment - ARC

SC1900 STUD WELDING SYSTEM



Made In the USA

DESCRIPTION

The SC1900 is fully integrated stud welding system with digital controls for time and current. This system was designed to be a perfect fit for shop use excelling at small to medium-sized diameter studs, all in a compact, affordable package.

Includes;

1800 Amp Power Supply, TWE17000 Heavy Duty stud gun, 35 feet of 4/0 weld and control cable and 25 feet of 4/0 ground cable.

** Specifications are subject to change without prior notice

Version 2.0 2/13/2012

FEATURES

Weld Range	1/4" - 7/8" Diameter	Consistent welding regardless of stud diameter.
Duty Cycle	1/4" Thru 3/8" - Unlimited 1/2" - 22 to 24 per minute 5/8" - 9 to 10 per minute 3/4" - 4 to 5 per minute 7/8" - 3 to 4 per minute	• Smooth arc curve targeted for small to medium-sized diameter studs. • Enhanced Duty Cycle for production requirements. • Capable of up to 100 feet of 4/0 welding cable accommodates a large variety of work station layouts. • Stepless time and current control allow for infinite settings for fine-tuning the welding output. • Stud Job Counter that can be reset for every job.
Dimensions	Height Width Length Weight	22" (559mm) 25" (635mm) 30" (762mm) 390 Lbs. (177kg)
Input Voltages		230 / 460 / 575 VAC 3 Phase 60Hz
Fusing Requirements	(Slow Acting)	230 / 120 Amps 460 / 60 Amps 575 / 50 Amps

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Stud Welding Equipment - ARC

SC2400 STUD WELDING SYSTEM

Heavy Duty Steel Fabrication Shop Stud Welding System



Made In the USA

DESCRIPTION

The SC2400 is a fully integrated stud welding system with two digital controls for time and current. The system was designed to meet the most challenging stud welding jobs.

Includes;

Power Supply Controller, TWE17000 Heavy Duty stud gun, 50 feet of 4/0 weld and control cable and 25 feet of 4/0 ground cable

FEATURES

Weld Range	1/4" - 1" Diameter	Consistent welding regardless of stud diameter.
Duty Cycle	1/4" Thru 5/8" - Unlimited 3/4" - 18 to 24 per minute 7/8" - 12 to 14 per minute 1" - 6 to 8 per minute	- Enhanced Duty Cycle for production requirements. - Powerful output for even the largest diameter jobs. - Stepless time and current control allow for infinite settings for fine-tuning the welding output. - Safety welding interlock keeps system from double triggering and saves on chuck wear. - Stud Job Counter that can be reset for every job.
Dimensions	Height Width Length Weight	29" (736.6mm) 28" (711.2mm) 36" (914.4mm) 665 Lbs. (302kg)
Input Voltages		230 / 460 / 575 VAC 3 Phase 60Hz
Fusing Requirements	(Slow Acting)	230 / 180 Amps 460 / 90 Amps 575 / 80 Amps

** Specifications are subject to change without prior notice

Version 2.1 12/18/2013

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Stud Welding Equipment - ARC

SC2402 STUD WELDING SYSTEM

Heavy Duty Steel Fabrication Shop Stud Welding System



Made In the USA

DESCRIPTION

The SC2402 is a fully integrated stud welding system with two digital controls for time and current. The system was designed to meet the most challenging stud welding jobs, including thru-deck applications (this also includes G90 decking).

Includes;

Power Supply Controller, TWE17000 Heavy Duty stud gun, 50 feet of 4/0 weld and control cable and 25 feet of 4/0 ground cable

FEATURES

Weld Range	1/4" - 1" Diameter	Consistent welding regardless of stud diameter.
Duty Cycle	1/4" Thru 5/8" - Unlimited 3/4" - 18 to 24 per minute 7/8" - 12 to 14 per minute 1" - 6 to 8 per minute	- Enhanced Duty Cycle for production requirements. - Powerful output for even the largest diameter jobs. - Stepless time and current control allow for infinite settings for fine-tuning the welding output. - Safety welding interlock keeps system from double triggering and saves on chuck wear. - Stud Job Counter that can be reset for every job.
Dimensions	Height Width Length Weight	29" (736.6mm) 28" (711.2mm) 36" (914.4mm) 760 Lbs. (345kg)
Input Voltages		380 / 400 VAC 3 Phase 50Hz
Fusing Requirements	(Slow Acting)	380 / 100 Amps 400 / 100 Amps

** Specifications are subject to change without prior notice

Version 2.0 05/15/2013

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Stud Welding Equipment - ARC

SC2420 STUD WELDING SYSTEM

Dual-Gun Shop Stud Welding System



Made In the USA

DESCRIPTION

The SC2420 is a fully integrated stud welding system with two digital controls for time and current. The system was designed to meet the most challenging stud welding jobs.

Includes;

Power supply controller, two (2) TWE17000 heavy duty stud guns, two (2) sets of 50ft of 4/0 weld and control cable, and two (2) sets of 25ft of 4/0 ground cable w/ HD clamp.

FEATURES

Weld Range	1/4" - 1" Diameter	Consistent welding regardless of stud diameter.
Duty Cycle	1/4" Thru 5/8" - Unlimited 3/4" - 18 to 24 per minute 7/8" - 12 to 14 per minute 1" - 6 to 8 per minute	- Enhanced Duty Cycle for production requirements. - Powerful output for even the largest diameter jobs. - Stepless time and current control allow for infinite settings for fine-tuning the welding output. - Safety welding interlock keeps system from double triggering and saves on chuck wear. - Stud Job Counter that can be reset for every job.
Dimensions	Height Width Length Weight	29" (736.6mm) 28" (711.2mm) 36" (914.4mm) 695 Lbs. (317kg)
Input Voltages		230 / 460 / 575 VAC 3 Phase 60Hz
Fusing Requirements	(Slow Acting)	230 / 180 Amps 460 / 90 Amps 575 / 80 Amps

** Specifications are subject to change without prior notice

Version 2.0 05/11/2013

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Stud Welding Equipment - ARC

SC3400 STUD WELDING SYSTEM



Made In the USA

DESCRIPTION

The SC3400 is a fully integrated stud welding system with two digital controls for time and current. The system was designed to meet the most challenging stud welding jobs, including thru-deck applications (this also includes G90 decking).

Includes;

3000 Amp power supply, TWE17000 Heavy Duty stud gun, 50 feet of 4/0 weld and control cable and 25 feet of 4/0 ground cable.

FEATURES

Weld Range	1/4" - 1-1/4" Diameter	Consistent welding regardless of stud diameter.
Duty Cycle	1/4" Thru 5/8" - unlimited 3/4" - 22 to 24 per minute 7/8" - 16 to 18 per minute 1" - 12 to 14 per minute 1-1/4" - 4 to 5 per minute	• Smooth arc curve allows for the wide range of welding. • Enhanced Duty Cycle for production requirements. • Powerful output for even the largest diameter jobs. • Stepless time and current control allow for infinite settings for fine-tuning the welding output. • Safety welding interlock keeps system from double triggering. • Stud Job Counter that can be reset for every job.
Dimensions	Height Width Length Weight	28" (736.6mm) 29" (711.2mm) 36" (914.4mm) 760 Lbs. (345kg)
Input Voltages		230 / 460 / 575 VAC 3 Phase 60Hz 400 VAC 3 Phase 50Hz
Fusing Requirements	(Slow Acting)	230 / 200 Amps 460 / 100 Amps 575 / 90 Amps

** Specifications are subject to change without prior notice

Version 2.0 05/15/2013

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Stud Welding Equipment - ARC

SC3402 DUAL-GUN STUD WELDING SYSTEM



Made In the USA

DESCRIPTION

The SC3402 is fully-integrated, dual-gun, stud welding system with two digital controls for time and current. The system was designed to meet the most challenging stud welding jobs, including thru-deck applications (this also includes G90 decking).

Includes;

3000 Amp power supply, two (2) TWE17000 heavy duty stud guns, two (2) cable sets of 50-ft. of 4/0 weld and control cable, and two (2) sets of 25-ft. 4/0 ground cable.

FEATURES

Weld Range	1/4" - 1-1/4" Diameter	Consistent welding regardless of stud diameter.
Duty Cycle	1/4" Thru 5/8" - unlimited 3/4" - 22 to 24 per minute 7/8" - 16 to 18 per minute 1" - 12 to 14 per minute 1-1/4" - 4 to 5 per minute	• Smooth arc curve allows for the wide range of welding. • Enhanced Duty Cycle for production requirements. • Powerful output for even the largest diameter jobs. • Stepless time and current control allow for infinite settings for fine-tuning the welding output. • Safety welding interlock keeps system from double triggering. • Stud Job Counter that can be reset for every job.
Dimensions	Height Width Length Weight	28" (736.6mm) 29" (711.2mm) 36" (914.4mm) 875 Lbs. (397kg)
Input Voltages		230 / 460 / 575 VAC 3 Phase 60Hz 400 VAC 3 Phase 50Hz
Fusing Requirements	(Slow Acting)	230 / 200 Amps 400 / 100 Amps 460 / 100 Amps 575 / 90 Amps

** Specifications are subject to change without prior notice

Version 1.6 10/03/2012

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Stud Welding Equipment - ARC

GENERATOR STUD WELDING SYSTEM

Heavy Duty Steel Stud Welding System



Made In the USA

The **TRU-WELD** Diesel Generator is a fully-integrated, stud welding system that offers portability along with your stud welding needs. This system incorporates a SC3400 Heavy Duty Stud Welder with its own portable power source, which enables you to finish jobs effectively and efficiently, without the costly task of disconnecting the power and moving the unit as the job requires.

SYSTEM FEATURES

- Aluminum weather enclosure
- Full sound attenuation
- Critical Sound muffler
- Block engine heater
- Battery charger
- Electronic governor
- Auto-Start control w/over-speed and over-crank shut down
- Automatic low-water shut down
- Alternator w/Permanent Magnet Generator and Automatic Voltage Control
- Two (2) 120 VAC outlets



Version 1.4 10/03/2012

SPECIFICATIONS

Power	480 VAC, 3 Phase
Amp Load Capacity	300 Amps
Generator	256 KVA
Circuit Breaker	350 Amp (Main Line)

** Specifications are subject to change without prior notice

[HTTP://TruweldStudWelding.com](http://TruweldStudWelding.com)

SYSTEM INCLUDES;

- Mobile Generator
- SC3400 Heavy Duty Welder
- TWE17000 Heavy Duty Stud Gun
- 25 ft. 4/0 ground cable w/clamp
- 50 ft. 4/0 starter combo cable
- 100 ft. 4/0 combo cable



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Stud Welding Equipment - ARC

TWE 19000 LIGHT DUTY STUD GUN



DESCRIPTION

The TWE19000 has been designed to fit comfortably for all hands, including when wearing a work glove. The neck of the handle has been tapered so that when grasped, the trigger can be accessed easily, without any unnecessary strain. The handle length allows for better balance of the stud gun and it keeps the welding cable and connector away from your hand, minimizing operator fatigue.

FEATURES

The TWE19000 is approximately 8.0" long from the weld cable to the back cap, and approximately 7" long from the top of the stud gun to the bottom of the handle. The overall weight of the stud gun is approximately 4.2 pounds (excludes 8.5 feet of 2/0 weld cable and 9 feet of control cable. This also excludes all connectors, legs, and foot piece.)

The TWE19000 can be ordered to operate with any type of stud welding equipment. Simply specify the make and model of your equipment and we will provide you with a stud gun connection that is compatible with your unit, regardless of the manufacturer.

Order your TWE19000 Light Duty Stud Gun from your local TRU-WELD Equipment Distributor.

** Specifications are subject to change without prior notice

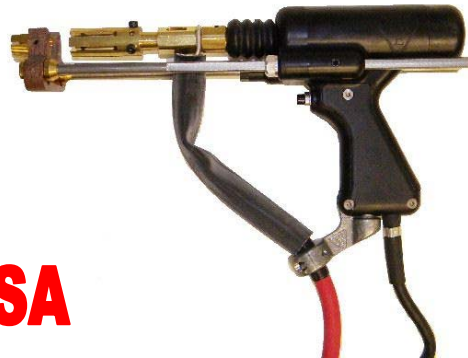
Version 1.4 12/20/2011

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Stud Welding Equipment - ARC

TWE 18500 MEDIUM DUTY STUD GUN



Made In the USA

DESCRIPTION

The TWE85000 has been designed to fit comfortably for all hands, including when wearing a work glove. The neck of the handle has been tapered so that when grasped, the trigger can be accessed easily, without any unnecessary strain. The handle length allows for better balance of the stud gun and it keeps the welding cable and connector away from your hand, minimizing operator fatigue.

FEATURES

The TWE18500 is approximately 8.5" long from the weld cable to the back cap, and approximately 7" long from the top of the stud gun to the bottom of the handle. The overall weight of the stud gun is approximately 4.8 pounds (excludes 8.5 feet of 2/0 weld cable and 9 feet of control cable. This also excludes all connectors, legs, and foot piece.)

The TWE18500 can be ordered to operate with any type of stud welding equipment. Simply specify the make and model of your equipment and we will provide you with a stud gun connection that is compatible with you unit, regardless of the manufacturer.

Order your TWE18500 Medium Duty Stud Gun from your local TRU-WELD Equipment Distributor.

** Specifications are subject to change without prior notice

Version 1.5 10/03/2012

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Stud Welding Equipment - ARC

TWE 1700 HEAVY DUTY STUD GUN

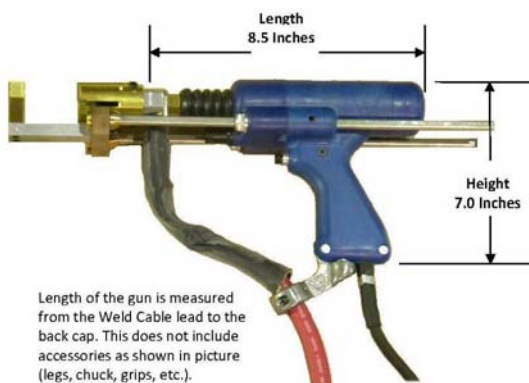


DESCRIPTION

The TWE17000 has been designed to fit comfortably for all hands, including when wearing a work glove. The neck of the handle has been tapered so that when grasped, the trigger can be accessed easily, without any unnecessary strain. The handle length allows for better balance of the stud gun and it keeps the welding cable and connector away from your hand, minimizing operator fatigue.

FEATURES

The TWE17000 heavy duty stud gun has a welding range from 1/8" through 1-1/4" diameter studs.



The TWE17000 is approximately 8.5" long from the weld cable to the back cap, and approximately 7" long from the top of the stud gun to the bottom of the handle. The overall weight of the stud gun is approximately 15 pounds (with 8.5 feet of 4/0 weld cable and 8 feet of control cable (This also includes all connectors, legs, and foot piece.).

The TWE17000 can be ordered to operate with any type of stud welding equipment. Simply specify the make and model of your equipment and we will provide you with a stud gun connection that is compatible with you unit, regardless of the manufacturer.

Order your TWE17000 Heavy Duty Stud Gun from your local TRU-WELD Equipment Distributor.

** Specifications are subject to change without prior notice

Version 1.4 12/20/2011

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Stud Welding Equipment - ARC

ARC 500 STUD WELDING UNIT



ARC 500

Stud Welding Unit
for ARC stud welding
according to current standards

Technical Data

Welding range	#4 to 7/16", dia. 14 ga to 5/16" (M3 to MR10, dia. 2 to 8 mm)	
Welding material	Mild steel, stainless steel	
Welding rate	5 to 15 studs/min (depending on application and stud dia.)	
Welding current	580 A	
Welding time	5 to 350 msec	
Primary power	230/460 V 3 phases, 50/60 Hz, 50/35 AT or 575 V, 3 phases, 50/60 Hz, 25 AT (alternative input voltages available)	
Power source	Transformer/Rectifier	
Cooling type	F (temperature controlled cooling fan)	
IP-Code	IP 23	
Dimension L x W x H	18.50" x 9.06" x 8.66" (470 x 230 x 220 mm) without handle	
Weight	68.34 lbs (31 kg)	
Order No.	230/460 V: 93-16-0401A	575V: 93-15-0401A

General Information

Application

- Especially suitable for thicker sheets of about 2 mm or higher
- **ISO** – especially suitable for attaching cut-to-length ARC-ISO and Fiberfix pins; also material with high heat resistance; excellent for insulation applications in building construction and fire-resistant insulation (FRI)

Process variants

- **Short cycle drawn arc welding**
- **Drawn arc welding**

Equipment

- **Welding with ceramic ferrule (series)**

Stud Welding Equipment - ARC

ARC 800 STUD WELDING UNIT



ARC 800

Stud Welding Unit
for ARC stud welding
according to current standards

Technical Data		
Gas/Automation	Series/Option	
Welding range	#4 to 1/2", dia. 14 ga to 3/8" (M3 to MR12, dia. 2 to 10 mm)	
Welding material	Mild steel, stainless steel	
Welding rate	7 to 17 studs/min (depending on application and stud dia.)	
Welding current	800 A	
Welding time	5 to 1,000 msec	
Primary power	230/460 V 3 phases, 50/60 Hz, 50/35 AT or 575 V, 3 phases, 50/60 Hz, 25 AT (alternative input voltages available)	
Power source	Transformer/Rectifier	
Cooling type	F (temperature controlled cooling fan)	
IP-Code	IP 23	
Dimension L x W x H	18.50" x 9.06" x 8.66" (470 x 230 x 220 mm) without handle	
Weight	81.57 lbs (37 kg)	
Order No.	230/460 V: 93-16-0702A (Gas) 93-16-0704A (Gas/Automation)	575V: 93-15-0702A (Gas) 93-15-0704A (Gas/Automation)
General Information		
Application		
Especially suitable for thicker sheets of about 2 mm or higher		
Process variants		
- Short cycle drawn arc welding - Drawn arc welding		
Equipment		
- Welding with ceramic ferrule (series) - Welding with shielding gas (series) - Automatic (optional)		

Stud Welding Equipment - ARC

IT 1002 STUD WELDING UNIT



Inverter

Maximum welding quality
Maximum welding rates
Minimum energy consumption
Minimum weight
Maximum efficiency

IT 1002

Stud Welding Unit
for ARC stud welding
according to current standards

Technical Data

Gas/Automation/Process control	Series/Option/Option
Welding range	#4 to 5/8", dia. 14 ga to 9/16" (M3 to MR16, dia. 2 to 14 mm)
Welding material	Mild steel, stainless steel, aluminum
Welding rate	1/2" (M12) = 25 studs/min
Welding current	1,000 A (max.)
Current adjustment range	Stud welding 100 to 1,000 A, electrode 50 to 400 A (stepless)
Welding time	5 to 1,000 msec (stepless)
Primary power	480/460 V, 3 phases, 50/60 Hz, 35 AT (alternative input voltages available)
Connected load	50 KVA (with 400 V mains), 40 kW
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 23
Dimension L x W x H	26 " x 11" x 13.4" (660 x 280 x 340 mm) without handle
Weight	63.9 lbs (29 kg)
Order No.	93-66-1202 (Gas) 93-66-1204 (Gas/Automation) 93-66-1206 (Gas/Automation/Process control)

General Information

Application

- Especially suitable for thicker sheets of about 2 mm or higher

Process variants

- Short cycle drawn arc welding
- Drawn arc welding

Equipment

- Welding with ceramic ferrule (series)
- Welding with shielding gas (series)
- Automation (optional)
- Process sequence control (optional)

COMPLETE
STUD WELDING
Products • Service • Knowledge • Integrity

Stud Welding Equipment - ARC

ARC 1550 STUD WELDING UNIT



ARC 1550

Stud Welding Unit
for ARC stud welding
according to current standards

Technical Data

Gas/Automation	Series/Option
Welding range	#4 to 3/4", dia. 14 ga to 3/4" (M3 - M20 RD, dia. 2 to 19 mm)
Welding material	Mild steel, stainless steel
Welding rate	3 to 35 studs/min (depending on application and stud dia.)
Welding current	1,550 A
Current adjustment range	500 to 1,550 A (500 A - 800 A - 1,000 A - 1,200 A - 1,550 A)
Welding time	5 to 1,500 msec (stepless)
Primary power	460 V, 3 phases, 50/60 Hz, 63 AT (alternative input voltages available)
Connected load	40 kVA (460 V mains)
Power source	Transformer/Rectifier
Primary cable	16.40', 1/0 (5 m, 6 mm ²), 460 V; max. cable length 98.42' (30 m), 1/0 (6 mm ²) at 400 V
Max. welding cable extension	65.62', 4/0 (20m, 95 mm ²)
Cooling type	F (temperature controlled cooling fan)
IP-code	IP 23
Dimension L x W x H	18.11" x 15.74" x 28.74" (460 x 400 x 730 mm) without handle
Weight	293.21 lbs (133 kg)
Order No.	93-16-1552A (Gas) 93-16-1554A (Gas/Automation)

General Information

Application

- Especially suitable for thicker sheets of about 2 mm or higher

Process variants

- Short cycle drawn arc welding
- Drawn arc welding

COMPLETE
STUD WELDING
Products • Service • Knowledge • Integrity

Stud Welding Equipment - ARC

IT 2002 STUD WELDING UNIT



Inverter

Maximum welding quality
Maximum welding rates
Minimum energy consumption
Minimum weight
Maximum efficiency

IT 2002

Stud Welding Unit
for ARC stud welding
according to current standards

Technical Data

Gas	Option
Welding range	#4 to 1", dia. 14 ga to 1" (M3 to M24, dia. 2 to 25 mm)
Welding material	Mild steel, stainless steel, aluminum
Welding rate	Dia. 7/8" = 7 studs/min (dia. 22 mm = 7 studs/min)
Welding current	2,000 A (max.)
Current adjustment range	300 to 2,000 A (stepless)
Welding time	5 to 1,500 msec (stepless)
Primary power	480/460 V, 3 phases, 50/60 Hz, 63 AT (alternative input voltages available)
Connected load	100 KVA (with 400 V mains), 80 kW
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 23
Dimension L x W x H	23.6" x 19.7" x 32.7 " (600 x 500 x 830 mm) without handle
Weight	209.4 lbs (95 kg)
Order No.	93-66-2201 93-66-2202 (Gas)

General Information

Application

- Especially suitable for thicker sheets of about 2 mm or higher
- Especially suitable for welding of concrete anchors/shear connectors for job site applications
- Suitable for through deck welding

Process variants

- **Short cycle drawn arc welding**
- **Drawn arc welding**

Equipment

- **Welding with ceramic ferrule** (series)
- **Welding with shielding gas** (optional)

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STUD WELDING
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Stud Welding Equipment - ARC

IT 130 STUD WELDING UNIT



Inverter

Maximum welding quality
Maximum welding rates
Minimum energy consumption
Minimum weight
Maximum efficiency

IT 130

Stud Welding Unit
for ARC stud welding
according to current standards

Technical Data

Gas/Process control	Series/Series
Welding range	#4 to 1", dia. 14 ga to 1" (M3 to M24, dia. 2 to 25 mm)
Welding material	Mild steel, stainless steel, aluminum
Welding rate	Dia. 1" = 6 studs/min (dia. 25 mm = 6 studs/min)
Welding current	2,500 A (max.)
Current adjustment range	300 to 2,500 A (stepless)
Welding time	5 to 1,500 msec (stepless)
Primary power	480/460 V, 3 phases, 50/60 Hz, 63 AT (alternative input voltages available)
Connected load	150 KVA (with 400 V mains) 120 kW
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 21
Dimension L x W x H	25.6" x 22" x 50.8" (650 x 560 x 1,290 mm) without handle
Weight	352.7 lbs (160 kg)
Order No.	93-66-12133 (Gas/Process control/1 Gun connection)

General Information

Application

- Especially suitable for thicker sheets of about 2 mm or higher

Process variants

- Short cycle drawn arc welding
- Drawn arc welding

Equipment

- Welding with ceramic ferrule (series)
- Welding with shielding gas (series)
- Process sequence control (series)

COMPLETE
STUD WELDING
Products • Service • Knowledge • Integrity

Stud Welding Equipment - ARC

IT 3002 STUD WELDING UNIT



Inverter

Maximum welding quality
Maximum welding rates
Minimum energy consumption
Minimum weight
Maximum efficiency

IT 3002

Stud Welding Unit
for ARC stud welding
according to current standards

Technical Data

Gas	Option
Welding range	#4 to 1", dia. 14 ga to 1" (M3 to M24, dia. 2 to 25 mm)
Welding material	Mild steel, stainless steel, aluminum
Welding rate	Dia. 1" = 6 studs/min (dia. 25 mm = 6 studs/min) Through deck welding 3/4" = 12 studs/min (300 feet, AWG 4/0) Industrial application 3/4" = 14 to 15 studs/min
Welding current	2,600 A (max.)
Current adjustment range	300 to 2,600 A (stepless)
Welding time	5 to 1,500 msec (stepless)
Primary power	480/460 V, 3 phases, 50/60 Hz, 125 AT (alternative input voltages available)
Connected load	150 KVA (with 400 V mains), 120 kW
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 23
Dimension L x W x H	25.6" x 22" x 50.8" (650 x 560 x 1,290 mm) without handle
Weight	93-66-3211: 352.74 lbs (160 kg) 93-66-3221: 394.63 lbs (179 kg)
Order No.	93-66-3211 (1 Gun connection) 93-66-3221 (2 Gun connections)

General Information

Application

- Especially suitable for thicker sheets of about 2 mm or higher
- Especially suitable for welding of concrete anchors/shear connectors for job site applications
- Suitable for through deck welding

Process variants

- **Short cycle drawn arc welding**
- **Drawn arc welding**

Equipment

- **Welding with ceramic ferrule (series)**

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STUD WELDING
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Stud Welding Equipment - ARC

AI 06 STUD WELDING GUN (FOR INSULATION)



AI 06

Stud Welding Gun (for insulation)
for ARC stud welding
according to current standards

Technical Data

Welding range	ARC-ISO pins dia. #4 to 1/4" (dia. 3 to 6 mm)
Pin length	0.39" to 15.74" (10 to 400 mm) depending on tripod
Pin material	Mild steel, stainless steel
Pin type	ARC insulation pin, ARC fiberfix pin, ARC threaded stud, ARC pin
Length compensation	0.12" (3 mm) automatic
Stroke	Adjustment range 0.12" (3 mm), lockable
Spring pressure	Adjustable, arresting
Welding cable	32.81' (10 m)
IP-Code	IP 20
Workplace noise level	Up to 90 dB (A) may occur during welding
Dimension L x W x H	7.09" x 2.56" x 5.51" (180 x 65 x 140 mm) without cable, with foot piece
Weight	1.76 lbs (0.8 kg) without cable and tripod
Order No.	93-20-250 (gun including foot piece) 93-40-026 (tripod ISO with support tube) 93-40-066 (tripod ISO with support tube aluminum-teflon)

General Information

Application

- Especially suitable for thicker metal sheets from approx. 2 mm
- **ISO** – especially suitable for welding on ARC-ISO and Fiberfix pins
- Automatic compensation of length tolerance of welding elements through integrated length adjustment

Process variants

- **Short cycle drawn arc welding**
- **Drawn arc welding** with ceramic ring or shielded gas

Advantages

Structure

- Rigid casing made of impact-resistant plastic
- Torsion-resistant basic shell (casing) to accommodate all function elements and accessories (e.g. foot ring)
- Zero-play ball linear bearing for guiding the welding piston
- Sealed welding piston guidance
- Ergonomic design
- Compact dimensions

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Stud Welding Equipment - ARC

A 12 STUD WELDING GUN



A 12

Stud Welding Gun
for ARC stud welding
according to current standards

Technical Data

Welding range	#4 to 1/2", dia. 14 ga to 1/2" (M3 to M12, dia. 2 to 12 mm)
Stud length	0.39" to 15.74" (10 to 400 mm) depending on tripod
Stud material	Mild steel, stainless steel
Stud type	Any type or shape (special chucks if required)
Length compensation	0.12" (3 mm) automatic
Stroke	Adjustment range 0.12" (3 mm), lockable
Spring pressure	Adjustable, arresting
Welding cable	16.40' (5 m)
IP-Code	IP 20
Workplace noise level	Up to 90 dB (A) may occur during welding
Dimension L x W x H	7.87" x 2.56" x 5.51" (200 x 65 x 140 mm) without cable, with foot piece
Weight	1.76 lbs (0.8 kg) without cable
Order No.	93-20-270 (gun including foot piece) 93-40-021 (tripod gas complete) 93-40-022 (tripod ceramic ferrule (CF) complete)

General Information

Application

- Especially suitable for thicker metal sheets from approx. 2 mm
- **ISO** – especially suitable for welding on ARC-ISO and Fiberfix pins
- Automatic compensation of length tolerance of welding elements through integrated length adjustment

Process variants

- **Short cycle drawn arc welding**
- **Drawn arc welding** with ceramic ring or shielded gas

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Stud Welding Equipment - ARC

A 16 STUD WELDING GUN (CLAMPED)



A 16

Stud Welding Gun (damped)
for ARC stud welding
according to current standards

Welding range	Dia. #4 to 5/8" (dia. 3 to 16 mm)
Stud length	0.39" to 9.45" (10 to 240 mm) depending on tripod
Stud material	Mild steel, stainless steel
Stud type	Any type or shape (special chucks if required)
Length compensation	0.24" (6 mm) automatic
Stroke	Adjustment range 0.16" (4 mm), (0.01" (0.25 mm) steps, arresting)
Damping	Adjustable oildamper
Welding cable	15.91', 1/0 (4.85 m, 50 mm ²)
IP-Code	IP 20
Workplace noise level	Up to 90 dB (A) may occur during welding
Dimension L x W x H	10.24" x 2.91" x 8.66" (260 x 74 x 220 mm) without cable, with foot piece
Weight	4.41 lbs (2 kg) without cable
Order No.	93-21-280

General Information

Application

- Especially suitable for thicker metal sheets from approx. 2 mm
- Automatic compensation of length tolerance of welding elements through integrated length adjustment

Process variants

- **Short-cycle drawn-arc welding**
- **Drawn-arc-welding** with ceramic ring or shielded gas

Advantages

Structure

- Rigid casing made of impact-resistant plastic
- Slide bearing for guiding the welding piston
- Sealed welding piston guidance
- Ergonomic design
- Compact dimensions
- Lift adjustment
- Stud length freely adjustable
- Mechanical structure tested in production

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website www.completestudweld.com e-mail sales@completestudweld.com

32035 Creekside Drive, Cleveland, Ohio 44124 fax 216.378.0349 telephone 216.904.4008

Stud Welding Equipment - ARC

A 22 STUD WELDING GUN (CLAMPED)



A 22

Stud Welding Gun (damped)
for ARC stud welding
according to current standards

Technical Data

Welding range	Dia. 9/16" to 7/8" (dia. 1") (dia. 14 to 22 mm (dia. 25 mm))
Stud length	0.39" to 15.35" (10 to 390 mm) depending on tripod
Stud material	Mild steel, stainless steel
Stud type	Any type or shape (special chucks if required)
Length compensation	0.35" (9 mm) automatic
Stroke	Adjustment range 0.24" (6 mm), (0.01" (0.25 mm) steps, arresting)
Damping	Adjustable oil damper
Welding cable	15.91', 3/0 (4.85 m, 95 mm ²)
IP-Code	IP 20
Workplace noise level	Up to 90 dB (A) may occur during welding
Dimension L x W x H	10.24" x 2.91" x 8.66" (260 x 74 x 220 mm) without cable, with foot piece
Weight	4.41 lbs (2 kg) without cable
Order No.	93-21-290

General Information

Application

- Especially suitable for thicker metal sheets from approx. 2 mm
- Especially suitable for through deck welding
- Automatic compensation of length tolerance of welding elements through integrated length adjustment

Process variants

- **Drawn arc welding** with ceramic ring

Advantages

Structure

- Rigid casing made of impact-resistant plastic
- Slide bearing for guiding the welding piston
- Sealed welding piston guidance
- Ergonomic design
- Compact dimensions
- Lift adjustment
- Stud length freely adjustable
- Mechanical structure tested in production
- Reduced heating of the stud welding gun body thanks to externally positioned welding current cable

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Stud Welding Equipment - ARC

A 25 STUD WELDING GUN (CLAMPED)



A 25

Stud Welding Gun (damped)
for ARC stud welding
according to current standards

Technical Data

Welding range	Dia. 9/16" to 1" (dia. 14 to 25 mm)
Stud length	0.39" to 15.35" (10 to 390 mm) depending on tripod
Stud material	Mild steel, stainless steel
Stud type	Any type or shape (special chucks if required)
Length compensation	0.35" (9 mm) automatic
Stroke	Adjustment range 0.24" (6 mm), (0.01" (0.25 mm) steps, arresting)
Damping	Adjustable oil damper
Welding cable	4.92', 4/0 (1.5 m, 120 mm ²)
IP-Code	IP 20
Workplace noise level	Up to 90 dB (A) may occur during welding
Dimension L x W x H	10.24" x 2.91" x 8.66" (260 x 74 x 220 mm) without cable, with foot piece
Weight	4.41 lbs (2 kg) without cable
Order No.	93-21-295

General Information

Application

- Especially suitable for thicker metal sheets from approx. 2 mm
- Especially suitable for through deck welding
- Automatic compensation of length tolerance of welding elements through integrated length adjustment

Process variants

- **Drawn arc welding** with ceramic ring

Advantages

Structure

- Rigid casing made of impact-resistant plastic
- Slide bearing for guiding the welding piston
- Sealed welding piston guidance
- Ergonomic design
- Compact dimensions
- Lift adjustment
- Stud length freely adjustable
- Mechanical structure tested in production
- Reduced heating of the stud welding gun body thanks to externally positioned welding current cable

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Stud Welding Equipment - Short Cycle

SC 2401 STUD WELD UNIT



SC 2401

Stud Welding Unit

for short cycle drawn arc stud welding
according to current standards

Technical Data	
Welding range	Short Cycle: #4 to 3/16", dia. 14 ga to 3/16" (M3 to M5, dia. 2 to 5 mm)
Welding material	Mild steel, stainless steel
Welding rate	10 to 15 studs/min (depending on application and stud dia.)
Capacitance	99,000 µF
Welding current	800 to 2,200 A (by charging voltage)
Welding time	10 msec
Energy	2,400 Ws
Charging voltage	70 to 220 V (stepless voltage regulation)
Primary power	115/230 V, 50/60 Hz, 10 AT
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 23
Dimension L x W x H	20.08" x 7.09" x 9.84" (510 x 180 x 250 mm) without handle
Weight	57.32 lbs (26 kg)
Order No.	91-12-2401A
General Information	
Application	
• ISO – especially suitable for attaching cut-to-length ARC-ISO and Fiberfix pins; also material with high heat resistance; excellent for insulation applications in building construction and fire-resistant insulation (FRI)	
Process variants	
• Short cycle drawn arc welding	
Advantages	
Features	
• Microcontroller – for precise process times, optimal functional reliability and maximum operating convenience • Function monitoring – automatic function test following power-up; monitoring of all internal system functions • Display of error codes – on digital display • Library function – automatic specification of charging voltage through selection of stud diameter according to welding range; fine adjustment via arrow keys	

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SECTION 13

STUD WELDING EQUIPMENT – AUTO FEED

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

OFFICE: 216.904.4008

EMAIL: SALES@COMPLETESTUDWELD.COM

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Stud Welding Equipment - Auto Feed

CDMi 2402 TECHNICAL DATA SHEET



Inverter-Capacitor Charging Technology

Maximum welding rates
Minimum energy consumption
Minimum weight
Maximum efficiency

CDMi 2402

Stud Welding Unit

for CD stud welding (capacitor discharge welding)
according to current standards

Technical Data

Automation	Series
Welding range	#4 to 5/16" (7/16" limited), dia. 14 ga to 5/16" (dia. 3/8" limited) M3 to M8 (M10 limited), dia. 2 to 8 mm (dia. 10 mm limited)
Welding material	Mild steel, stainless steel, aluminum and brass
Welding rate	M3 = 40 studs/min. (Charging voltage 60 V) M8 = 21 studs/min. (Charging voltage 170 V) (M10 = 17 studs/min. (Charging voltage 210 V))
Capacitance	99 000 µF/33 000 µF*
Welding time	1 to 3 msec
Energy	2 400 Ws/800 Ws*
Charging voltage	50 to 220 V (stepless voltage regulation)
Primary power	115 V, 50/60 Hz, 10 AT
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 21
Dimension L x W x H	22.44" x 11.22" x 11.42" (570 x 285 x 290 mm) without handle
Weight	57.32 lbs (26 kg)
	* with change over of capacitors
Order No.	92-12-22412 (Automation)

General Information

Application

- Especially suitable for thin sheets (at least 0.5 mm)

Process variants

- Contact welding
- Gap welding

Equipment

- Automation (series)
- Menu navigation in various languages: German, English, French, Italian, Russian, Portuguese, Spanish and Chinese

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Stud Welding Equipment - Auto Feed

CDMI 2402 TECHNICAL DATA SHEET

Advantages

Features

- **Microcontroller** – for precise process times, optimal functional reliability and maximum operating convenience
- **Function monitoring** – automatic function test following power-up; monitoring of all internal system functions
- **Display of error codes** – on LCD display
- **Function control** – All functions are visible on the operator panel via LED or display

Structure

- **Compact**
- **Robust** – metal housing withstands rough treatment in shop and on site
- **Industrial plugs** – standardised and sturdy plugs
- **Two ground connections** – direct coupling of several stud welding machines possible when installed in complex welding systems

Safety

- With integrated **mains filter** (protection against voltage peaks)
- **Optimal for construction sites with large mains voltage fluctuations** – use even with critical voltage supply (- 25 % + 20 %)
- Fulfills the requirements according to DIN EN 60974-10: 2008-09 - **EMC test**
- Fulfills the requirements according to DIN EN 60974-1: 2013-06 - Logged **high voltage test**
- Logged **capacitor forming** for quality control of the stud welding capacitors
- **Controlled capacitor forming** – step-by-step charging of capacitors after long standstill times for longer service life of capacitors
- **Retriggering lock-out** – prevents welding on a welding element that has already been welded
- **Thermal control of inverter-capacitor charging unit and internal temperature of stud welding unit**– automatic switch-off in the event of overheating
- **Temperature controlled cooling fan** – reduces noise and dust in the stud welding unit (greater system reliability)
- **Control unit galvanically separated from welding lines** – high degree of functional safety
- **Optimal cooling air stream** – protection of the electronic components against contamination and ideal cooling of the inverter-capacitor charging circuit board for high cycle sequences
- **Shock-resistant operation panel** – operation panel protected by protruding casing
- **Shock-resistant capacitors** – capacitors protected by shock proofing elements
- **Accessory: Control guard made of acrylic glass (lockable)** – prevents damage and unauthorised access

Welding

- **Graphic display** – clear operator guidance via large LCD display
- **Setting of charging voltage in V and charging energy in Ws** – when changing the charging voltage, the charging energy is automatically adjusted
- **Process sequence control** – detection and evaluation of influencing variables of the welding process via the process control (CP); after every welding, a comparison of the reference CP value and the actual values is performed; display of the actual and target value; welding stop when limit values are exceeded can be activated; limit values can be selected in steps; manual entry of CP value possible
- **15 programs can be stored** – in every program, the parameters (charging voltage, capacity, CP settings and automatic settings) can be selected digitally via a superior control system and specific to the application
- **Remote control of the stud welding machines via standardised RS232 interface possible** – the stud welding machines can be controlled directly via the PC or CNC welding systems
- **Library function** – library with stored welding parameters for different diameter and material combinations for a quick start of the welding process
- **User-specific settings**– weld counter (display of previously executed welds); menu navigation in various languages; units (metric, imperial); date; time; setting of the transmission rate of the interfaces

Stud Welding Equipment - Auto Feed

CDMI 2402 TECHNICAL DATA SHEET

- **Gun / welding head test** – functionality check of the welding guns or the welding heads with a lifting test (check of the lifting function of the gap welding guns and bolt welding heads without contact with the workpiece); functionality check of the welding guns or the welding heads by recording the movement time of the solenoid from triggering to the contact with the workpiece
- **Reading out of CP values via standardised RS232 interface** – for the output of data such as the date, time and welding parameters of each weld with the superior control system; welding parameters of every weld are logged
- **Powerful** – built-in power reserves
- **Inverter-capacitor charging technology** – makes high cycle rates possible
- **Trouble-free changing of welding voltage polarity** possible by reconnecting welding current and ground cables
- **Use of special capacitors** (developed for stud welding)
- **Capacitance switching** – 33 000 µF or 99 000 µF

Suitable stud welding guns/ heads

- C 08
- CA 08
- PAH-1
- KAH 412
- KAH 412 LA

Issue 06/14
(Technical data may change)

Stud Welding Equipment - Auto Feed

CDMi 3202 TECHNICAL DATA SHEET



Inverter-Capacitor Charging Technology

Maximum welding rates
Minimum energy consumption
Minimum weight
Maximum efficiency

CDMi 3202

Stud Welding Unit
for CD stud welding (capacitor discharge welding)
according to current standards

Technical Data

Automation	Series
Welding range	#4 to 7/16", dia. 14 ga to 3/8" M3 to M10, dia. 2 to 10 mm
Welding material	Mild steel, stainless steel, aluminum and brass
Welding rate	M3 = 43 studs/min. (Charging voltage 50 V) M8 = 25 studs/min. (Charging voltage 140 V) (M10 = 18 studs/min. (Charging voltage 200 V))
Capacitance	132 000 µF/66 000 µF*
Welding time	1 to 3 msec
Energy	3 200 Ws/1 600 Ws*
Charging voltage	50 to 220 V (stepless voltage regulation)
Primary power	115 V, 50/60 Hz, 10 AT
Power source	Capacitor
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 21
Dimension L x W x H	22.44" x 11.22" x 11.42" (570 x 285 x 290 mm) without handle
Weight	59.53 lbs (27 kg) * with change over of capacitors
Order No.	92-12-23212 (Automation)

General Information

Application

- Especially suitable for thin sheets (at least 0.5 mm)

Process variants

- Contact welding
- Gap welding

Equipment

- Automation (series)
- Menu navigation in various languages: German, English, French, Italian, Russian, Portuguese, Spanish and Chinese

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STUD WELDING
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Stud Welding Equipment - Auto Feed

CDMI 3202 TECHNICAL DATA SHEET

Advantages

Features

- **Microcontroller** – for precise process times, optimal functional reliability and maximum operating convenience
- **Function monitoring** – automatic function test following power-up; monitoring of all internal system functions
- **Display of error codes** – on LCD display
- **Function control** – All functions are visible on the operator panel via LED or display

Structure

- **Compact**
- **Robust** – metal housing withstands rough treatment in shop and on site
- **Industrial plugs** – standardised and sturdy plugs
- **Two ground connections** – direct coupling of several stud welding machines possible when installed in complex welding systems

Safety

- With integrated **mains filter** (protection against voltage peaks)
- **Optimal for construction sites with large mains voltage fluctuations** – use even with critical voltage supply (- 25 % + 20 %)
- Fulfils the requirements according to DIN EN 60974-10: 2008-09 - **EMC test**
- Fulfils the requirements according to DIN EN 60974-1: 2013-06 - Logged **high voltage test**
- Logged **capacitor forming** for quality control of the stud welding capacitors
- **Controlled capacitor forming** – step-by-step charging of capacitors after long standstill times for longer service life of capacitors
- **Retriggering lock-out** – prevents welding on a welding element that has already been welded
- **Thermal control of inverter-capacitor charging unit and internal temperature of stud welding unit**– automatic switch-off in the event of overheating
- **Temperature controlled cooling fan** – reduces noise and dust in the stud welding unit (greater system reliability)
- **Control unit galvanically separated from welding lines** – high degree of functional safety
- **Optimal cooling air stream** – protection of the electronic components against contamination and ideal cooling of the inverter-capacitor charging circuit board for high cycle sequences
- **Shock-resistant operation panel** – operation panel protected by protruding casing
- **Shock-resistant capacitors** – capacitors protected by shock proofing elements
- **Accessory: Control guard made of acrylic glass (lockable)** – prevents damage and unauthorised access

Welding

- **Graphic display** – clear operator guidance via large LCD display
- **Setting of charging voltage in V and charging energy in Ws** – when changing the charging voltage, the charging energy is automatically adjusted
- **Process sequence control** – detection and evaluation of influencing variables of the welding process via the process control (CP); after every welding, a comparison of the reference CP value and the actual values is performed; display of the actual and target value; welding stop when limit values are exceeded can be activated; limit values can be selected in steps; manual entry of CP value possible
- **15 programs can be stored** – in every program, the parameters (charging voltage, capacity, CP settings and automatic settings) can be selected digitally via a superior control system and specific to the application
- **Remote control of the stud welding machines via standardised RS232 interface possible** – the stud welding machines can be controlled directly via the PC or CNC welding systems
- **Library function** – library with stored welding parameters for different diameter and material combinations for a quick start of the welding process
- **User-specific settings**– weld counter (display of previously executed welds); menu navigation in various languages; units (metric, imperial); date; time; setting of the transmission rate of the interfaces

Stud Welding Equipment - Auto Feed

CDMI 3202 TECHNICAL DATA SHEET

- **Gun / welding head test** – functionality check of the welding guns or the welding heads with a lifting test (check of the lifting function of the gap welding guns and bolt welding heads without contact with the workpiece); functionality check of the welding guns or the welding heads by recording the movement time of the solenoid from triggering to the contact with the workpiece
- **Reading out of CP values via standardised RS232 interface** – for the output of data such as the date, time and welding parameters of each weld with the superior control system; welding parameters of every weld are logged
- **Powerful** – built-in power reserves
- **Inverter-capacitor charging technology** – makes high cycle rates possible
- **Trouble-free changing of welding voltage polarity** possible by reconnecting welding current and ground cables
- **Use of special capacitors** (developed for stud welding)
- **Capacitance switching** – 66 000 µF or 132 000 µF

Suitable stud welding guns/ heads

- **C 08**
- **CA 08**
- **PAH-1**
- **KAH 412**
- **KAH 412 LA**

Issue 06/14
(Technical data may change)

Stud Welding Equipment - Auto Feed

STUD WELDING EQUIPMENT – ARC EQUIPMENT



Inverter

Maximum welding quality
Maximum welding rates
Minimum energy consumption
Minimum weight
Maximum efficiency

IT 50

Stud Welding Unit
for ARC stud welding
according to current standards

Technical Data

Gas/Automation/Process control	Series/Series/Series
Welding range	#4 to 5/8", dia. 14 ga to 9/16" (M3 to MR16, dia. 2 to 14 mm)
Welding material	Mild steel, stainless steel, aluminum
Welding rate	1/2" (M12) = 25 studs/min
Welding current	1,000 A (max.)
Current adjustment range	300 to 1,000 A (stepless)
Welding time	5 to 1,000 msec (stepless)
Primary power	480/460 V, 3 phases, 50/60 Hz, 35 AT (alternative input voltages available)
Connected load	50 KVA (with 400 V mains), 40 kW
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 21
Dimension L x W x H	25.6" x 22" x 50.8" (650 x 560 x 1,290 mm) without handle
Weight	264.5 lbs (120 kg)
Order No.	93-66-42056 (Gas/Automatic/Process control/4 Gun connections)

General Information

Application

- Especially suitable for thicker sheets of about 2 mm or higher

Process variants

- Short cycle drawn arc welding
- Drawn arc welding

Equipment

- Welding with ceramic ferrule (series)
- Welding with shielding gas (series)
- Automation (series)
- Process sequence control (series)

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Stud Welding Equipment - Auto Feed

IT 90 STUD WELDING UNIT



Inverter

Maximum welding quality
Maximum welding rates
Minimum energy consumption
Minimum weight
Maximum efficiency

IT 90

Stud Welding Unit
for ARC stud welding
according to current standards

Technical Data

Gas/Automation/Process control	Series/Series/Series
Welding range	#4 to 1", dia. 14 ga to 7/8" (M3 to M24, dia. 2 to 22 mm)
Welding material	Mild steel, stainless steel, aluminum
Welding rate	Dia. 7/8" = 7 studs/min (dia. 22 mm = 7 studs/min)
Welding current	2,000 A (max.)
Current adjustment range	300 to 2,000 A (stepless)
Welding time	5 to 1,500 msec (stepless)
Primary power	480/460 V, 3 phases, 50/60 Hz, 63 AT (alternative input voltages available)
Connected load	100 KVA (with 400 V mains) 80 kW
Cooling type	F (temperature controlled cooling fan)
IP-Code	IP 21
Dimension L x W x H	25.6" x 22" x 50.8" (650 x 560 x 1,290 mm) without handle
Weight	93-66-12096: 315.26 lbs (143 kg) 93-66-42096: 363.76 lbs (165 kg)
Order No.	93-66-12096 (Gas/Automation/Process control/1 Gun connection) 93-66-42096 (Gas/Automatic/Process control/4 Gun connections)

General Information

Application

- Especially suitable for thicker sheets of about 2 mm or higher

Process variants

- Short cycle drawn arc welding
- Drawn arc welding

Equipment

- Welding with ceramic ferrule (series)
- Welding with shielding gas (series)
- Automation (series)
- Process sequence control (series)

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Stud Welding Equipment - Auto Feed

KAH 412 LA AUTOMATIC STUD WELDING HEAD WITH LENGTH COMPENSATION



KAH 412 LA

Automatic Stud Welding Head with length compensation
for CD or ARC stud welding with automatic stud feeding
according to current standards

Technical Data

Welding range	#4 to 5/16", dia. #4 to 5/16" (M3 to M8, dia. 3 to 8 mm); dia. 3/8" to 1/2" (dia. 10 to 12.7 mm) with modification only
Stud length	0.31" to 1.57" (8 to 40 mm) other lengths on request
Stud material	Mild steel, stainless steel, aluminum, brass
Total stroke of piston	0.28"
Stroke/Length compensation	0.2"/0.08", 0.16"/0.12"
Spring pressure	Arresting
IP-Code	IP 20
Workplace noise level	> 90 dB (A) may occur during welding
Dimension L x W x H	14.76" x 2.60" x 5.71" (375 x 66 x 145 mm) with chuck and quick change system
Weight	7.50 lbs (3.4 kg)
Order No.	94-37-412 (with length compensation)

General Information

Application

- Especially suitable for thin sheets (at least 0.5 mm)
- Automatic compensation of length tolerance of welding elements and height tolerance of the work piece through integrated length adjustment

Process variants

- **Gap welding**
- **Short cycle drawn arc welding**
- **Drawn arc welding** (optional)

Advantages

Structure

- Rigid casing made of metal
- Torsion-resistant aluminum-casing to accommodate all function elements and accessories
- Zero-play ball linear bearing for guiding the welding piston, to ensure maximum precision and reproducibility for welds
- Sealed welding piston guidance
- Compact dimensions
- Integrated lift and spring-loaded adjustment
- Stud length is freely adjustable (up to 40 mm; other lengths available on request)
- Infinitely adjustable spring-loaded adjustment can be read off the scale directly
- Prisma clamping system for fast exchange of the complete stud welding head
- Pushbutton detent system to facilitate changing the feeding tube
- Mechanical structure tested in production

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Stud Welding Equipment - Auto Feed

KAH 412 AUTOMATIC STUD WELDING HEAD WITH DIGITAL DISPLAY



KAH 412

Automatic Stud Welding Head with Digital Display
for CD or ARC stud welding with automatic stud feeding
according to current standards

Technical Data

Welding range	#4 to 5/16", dia. #4 to 5/16" (M3 to M8, dia. 3 to 8 mm); dia. 3/8" to 1/2" (dia. 10 to 12.7 mm) with modification only
Stud length	0.31" to 1.57" (8 to 40 mm) other lengths on request
Stud material	Mild steel, stainless steel, aluminum, brass
Stroke	Adjustment range 0.20" (5 mm), arresting
Spring pressure	Arresting
IP-Code	IP 20
Workplace noise level	> 90 dB (A) may occur during welding
Dimension L x W x H	14.76" x 2.60" x 5.71" (375 x 66 x 145 mm) with chuck and quick change system
Weight	7.50 lbs (3.4 kg)
Order No.	94-31-412C

General Information

Application

- Especially suitable for thin sheets (at least 0.5 mm)

Process variants

- **Contact welding** (optional)
- **Gap welding**
- **Short cycle drawn arc welding**
- **Drawn arc welding** (optional)

Advantages

Structure

- Rigid casing made of metal
- Torsion-resistant aluminum-casing to accommodate all function elements (e.g. ball bearing guide) and accessories
- Zero-play ball linear bearing for guiding the welding piston, to ensure maximum precision and reproducibility for welds
- Sealed welding piston guidance
- Compact dimensions
- Integrated lift and spring-loaded adjustment
- Stud length is freely adjustable (up to 40 mm; other lengths available on request)
- Digital display (1/100 mm) for the position of the welding piston using integrated measuring system
- Direct reading for the adjusted plunge and lift dimension
- Infinitely adjustable spring-loaded adjustment can be read off the scale directly
- Prisma clamping system for fast exchange of the complete stud welding head
- Pushbutton detent system to facilitate changing the feeding tube

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Stud Welding Equipment - Auto Feed

PAH-1 STUD WELDING GUN



PAH-1

Stud Welding Gun

for CD or ARC stud welding with automatic stud feeding according to current standards

Technical Data

Welding range	#4 to 5/16", dia. #4 to 5/16" (M3 to M8, dia. 3 to 8 mm)
Stud length	0.31" to 1.18" (8 to 30 mm)
Stud material	Mild steel, stainless steel, aluminum, brass
Stroke	Adjustment range 0.20" (5 mm)
Welding cable	9.84' (3 m)
IP-Code	IP 20
Workplace noise level	> 90 dB (A) may occur during welding
Dimension L x W x H	11.61" x 2.36" x 6.70" (295 x 60 x 170 mm) without cable
Weight	3.09 lbs (1.4 kg) without cable
Order No.	94-20-025

General Information

Application

- Especially suitable for thin sheets (at least 0.5 mm)

Process variants

- **Contact welding** (optional)
- **Gap welding**
- **Short cycle drawn arc welding**

Advantages

Structure

- Rigid casing made of impact-resistant plastic
- Slide bearing for guiding the welding piston
- Sealed welding piston guidance
- Ergonomic design
- Adjustable lift
- Stud length convertible (up to 30 mm)
- Mechanical structure tested in production
- Electronically controlled

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Stud Welding Equipment - Auto Feed

VBZ-3 FULLY AUTOMATIC STUD FEEDER



VBZ-3

Fully Automatic Stud Feeder
for welding elements with flange
according to current standards

Technical Data

Stud diameter	#4 to 5/16", dia. #4 to 5/16" (M3 to M8, dia. 3 to 8 mm) other diameter on request	
Stud length	0.31" to 1.97" (8 to 50 mm)	
Feed speed	Up to 30 studs/min (depending on welding element and feeding tube)	
Air pressure connection	6 bar/800 liter/min	
Electrical supply	115 V, 60 Hz, 1.8 A (alternative input voltages available)	
IP-Code	IP 20	
Dimension L x W x H	18.50" x 12.20" x 11.02" (470 x 310 x 280 mm)	
Weight	52.91 lbs (24 kg)	
Order No.	94-66-103B	(for dia. 3 mm)
	94-66-104B	(for dia. 4 mm)
	94-66-105B	(for dia. 5 mm)
	94-66-106B	(for dia. 6 mm)
	94-66-171B	(for dia. 7,1 mm)
	94-66-108B	(for dia. 8 mm)
	94-66-153B	(for X-mas tree stud dia. 5)
	94-66-163B	(for X-mas tree stud dia. 6)

General Information

Application

- Feeding unit VBZ-3 for quick, fully automatic feeding for welding elements with flange according to current standards
- Fully automatically feeding of **welding elements** from **dia. 3 to dia. 8 mm** (with flange); (other dia. on request)
- Length from **8 to 50 mm (no rebuilding)**

Options

- Additional regulation of exhaust air by a throttle is possible; this allows ideal adjustment of air flow required for various sizes of welding elements
- Special feeding units on request

Advantages

Features

- Feeding bowl with special coating, to reduce abrasion and noise
- Exhaust air is pulse controlled, no permanent air consumption

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Stud Welding Equipment - Auto Feed

PMB-LS2 PNEUMATIC CLAMP



PMB-LS2
Pneumatic Clamp

Technical Data

Clamping movement	Double action air cylinder through curved sector control
Horizontal clamping way	0.30" (7.5 mm)
Vertical clamping way	0.16" (4 mm)
Max. thickness of work piece	Through elevation adjustment of clamp up to 0.39" (10 mm)
Width of clamp	0.59" (15 mm)
Air pressure connection	Up to 6 bar
Clamp pressure	300 N at 6 bar
Dimension L x W x H	3.54" x 1.97" x 1.97" (90 x 50 x 50 mm)
Weight	1.10 lbs (500 g)
Order No.	90-60-120

General Information

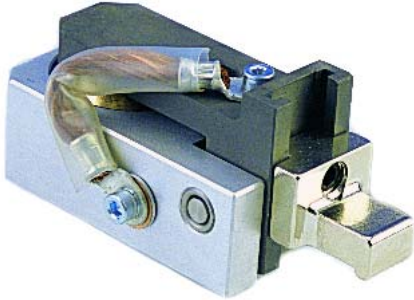
Description

- Pneumatic work piece clamps PMB-LS2 guarantees fast and accurate clamping of the work
- The patented horizontal and vertical movement of clamp fingers allow work piece loading from top or front
- Integrated ground connection to the clamp
- Forward- and clamp-movement through curved sector control
- Bellows are protecting the motor apparatus of fouling

Issue 04/08
(Technical data may change)

Stud Welding Equipment - Auto Feed

PMB-S PNEUMATIC CLAMP



PMB-S
Pneumatic Clamp

Technical Data

Clamping movement	Single action air cylinder
Vertical clamping way	0.16" (4 mm)
Max. thickness of work piece	Through elevation adjustment of clamp up to 0.79" (20 mm)
Width of clamp	0.59" (15 mm)
Air pressure connection	Up to 6 bar
Clamp pressure	300 N at 6 bar
Dimension L x W x H	3.86" x 1.77" x 1.65" (98 x 45 x 42 mm)
Weight	1.01 lbs (460 g)
Order No.	90-60-011

General Information

Description

- Compact pneumatic clamp with vertical movement
- Ground connection to the clamp
- In- and output of the work piece only from the front side

Issue 04/08
(Technical data may change)

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SECTION 13

STUD WELDING EQUIPMENT – CNC AUTO FEED SYSTEMS

FOR INQUIRIES, TO PLACE ORDERS,
SERVICE AND TECHNICAL SUPPORT CONTACT
ANY OF THE FOLLOWING:

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EMAIL: SALES@COMPLETESTUDWELD.COM

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Stud Welding Equipment - CNC Systems



PC-S PRODUCTION CENTER STANDARD MANUAL

PC-S

Production Center Standard Manual

Technical Data

T-slot work plate	19.69" x 14.76" (500 x 375 mm)
Welding range	#4 to 5/16", dia. #4 to 5/16" (M3 to M8, dia. 3 to 8 mm); dia. 3/8" to 1/2" (dia. 10 to 12.7 mm) only possible with modification
Stud length	0.31" to 1.57" (8 to 40 mm) other dimensions on request
Stud feeding *)	Manual or automatic stud feeding (optional) *) not included in delivery
Positioning (accuracy) of welded studs	± 0.008" (± 0.2 mm)
Working stroke of stud welding head	Z-max. = 4.92" (125 mm), z-adjustable = 0.16" to 1.77" (4 to 45 mm) bottom end stop
Stud welding head *)	KAH 412 alternative: KAH 412 LA (mechanical length compensation - gap), *) not included in delivery
Max. number of stud welding heads	1
Connections	Electrical: 115 V, 16 A, 60 Hz Pneumatic: 6 bar min/10 bar max./inner hose dia. 1/4" (dia. 6 mm)
Dimension L x B x H	47.24" x 39.37" x 78.74" (1,200 x 1,000 x 2,000 mm) without cover, 55.12" x 39.37" x 86.61" (1,400 x 1,000 x 2,200 mm) with cover
Weight	Approx. 330.69 lbs (150 kg)
Order No.	90-70-5028D

General Information

Application

- All variations of stud welding
- With manual or automatic stud feeding (30% faster)

Options

- Different stud welding units
- Automatic stud feeder VBZ-3
- Work piece fixtures
- Machine protection cover
- Custom made handling systems
- Pneumatic clamp

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Stud Welding Equipment - CNC System

MPW 1010/2010 CNC MULTI PRODUCTION WELDER



MPW
CNC Multi Production Welder

Technical Data

Working range	49.21" x 41.34" (1,250 x 1,050 mm) MPW 1010; 49.21" x 88.58" (1,250 x 2,250 mm) MPW 2010 (maximum working range for up to 3 welding heads)
Welding range	#4 to 5/16", dia. #4 to 5/16" (M3 to M8, dia. 3 to 8 mm); dia. 3/8" to 1/2" (dia. 10 to 12.7 mm) only possible with modification
Stud length	0.31" to 1.57" (8 to 40 mm) other lengths on request
Welding capacity	Up to 40 studs/min (depending on stud welding unit, stud type and positioning of stud)
Traverse speed	196.85"/min (60 m/min)
Stud feeding	Automatic stud feeding (up to 3 different stud length per welding head)
Positioning accuracy of welded stud	± 0.0059" (± 0.15 mm) for steel and ± 0.008" (± 0.2 mm) for aluminum (depending on work piece and stud geometry)
Positioning and repeat accuracy	± 0.002" (± 0.05 mm)
Stud welding head	KAH 412 Optional: KAH 412 LA (mechanical length compensation - gap)
Max. number of stud welding heads	4 (up to 3 stud lengths per welding head possible)
Connections	Electrical: 400 V, 16 A (32 A), 50 Hz Pneumatic: 6 bar min./10 bar max./inner hose dia. 1/4" (dia. 6 mm)
Motor-driven Z-axis	Z = 0 to 4.53" (0 to 115 mm) free programmable because of servo drive technology
Dimension L x W x H	90.55" x 92.52" x 86.61" (2,300 x 2,350 x 2,200 mm) MPW 1010; 137.80" x 92.52" x 86.61" (3,500 x 2,350 x 2,200 mm) MPW 2010
Order No.	According to project

General Information

Application

- Basic milling operations (optional)
- Special applications like gluing, foaming etc. (on request)

Process variants

- Tip ignition (CD)
- Drawn arc welding (ARC)
- Short cycle drawn arc welding (SC)

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Welding Equipment - MARC Process



MARC 3 PAD WELDING MACHINE PC-M3

MARC 3

Pad Welding Machine PC-M3
for pad welding with rotating arc

Technical Data

Welding range	Min. dia. 5/16" (dia. 8 mm), max. dia. 1.26" (dia. 32 mm) or internal thread #8 to 0.71" (M4 to M18)
Height of pad	Min. 0.16" (4 mm), max. 1.18" (30 mm)
Welding material	Weldable, high and low alloys, mild steel
Welding rate	Depending on dia. 12 pieces/min (dia. 1.10" (dia. 28 mm) approx. 2 to 4 pieces/min)
Welding current	300 to 1,000 A stepless remote controllable
Welding time	5 to 2,000 msec stepless remote controllable
Primary power	480 V, 16 A
Gas connection	Series
Air pressure connection	6 bar/inner hose dia. 1/4" (dia. 6 mm)
Power source	Inverter
Primary power Inverter	480 V, 32 AT (IT MARC 1002)
Controller	CEL M440, 186 GHz
Programming modes	Welding current, welding time, any motion profile, welding piston, shielding gas
Welding head	Linearmotor driven
Field former unit	Tempered
Pneumatic work stroke	4.72" (120 mm)
Height adjustment	9.84" (250 mm)
Order No.	According to project

General Information

Application

- The most innovative process for welding pad type elements
- To be used for nearly any application in metal working industry: The very low heat input avoids any distortion of the work piece and you get a perfect gas-tight weld with high and dynamic loading capacity
- The most effective as well as most economical welding procedure for the welding hollow cylindrical parts
- Closed and pressure sealed weld all-over
- The welding requirements are manifold, reaching from the simplest static firmness to dynamic demanded gas tight connections at high temperature and pressure
- Austenitic stainless steel (1.4301 and similar), low alloys (RSt 37-2 / S 235J2G3)
- **High productivity** together with low manufacturing costs
- Free programmable welding head

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