TRU-WELD

A Division of TFP Corporation



CAPACITOR DISCHARGE (CD)

Stud Welding Booklet

- CD Studs (Flanged)
- CD Studs (un-Flanged)
- CD Stud Welding Equipment
- CD Stud Welding Information
- Shipping Weights







460 Lake Road
Medina, Ohio 44256
www.truweldstudwelding.com

1-800-321-5588 Toll Free 330-725-7741

330-725-0161 Fax



Since 1959 Tru-Weld has been an industry leader of weld stud sales and manufacturing. TRU-WELD manufactures weld stud fasteners for a vast variety of applications. From the small everyday handheld tools, yard machinery, etc. to automobiles, aircrafts, bridges, ocean liners, steel structure buildings and military vehicles; weld studs are all around us in our everyday lives.

Stud Welding

Simply stated, the process of "Stud Welding" is the fusing of a threaded or non-threaded metal shaft or stud to a workpiece with a high power electrical detonation - yielding a stronger bond than if it were forged or traditionally welded.

Full Service Manufacturing With our full in-house manufacturing facility, Heat Treating and Finishing departments, Tru-Weld will design and manufacture a weld stud to suit your specific needs and application.

Service, Quality and Competitive Pricing The three vital steps that make the business world go around. We believe that with uncompromised service, high quality manufacturing and competitive pricing, TRU-WELD will continue to retain our current and gain new customers around the world. Please contact us to see if we can add you as another satisfied customer.

Experience Since 1928 TFP Corp. has been manufacturing Cold-Formed Fasteners. And now 49 years later - since 1959 Tru-Weld has maintained industry leadership in weld stud sales, manufacturing and equipment.

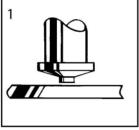
Our experienced Management and Staff is committed to provide the utmost in quality and service in every step of our production, while remaining competitive in the marketplace. It is our goal to meet our customer's needs more effectively than our competitors through a process of continuous quality improvement. Our long-standing relationship with our customers and suppliers is our key to continued success and growth. If we can be of any further assistance to you and your company, please do not hesitate to contact us.

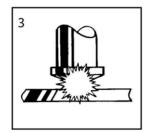


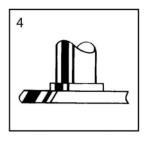
THE STUD WELDING PROCESS

Capacitor Discharge Stud Welding

Capacitor Discharge (CD) stud welding is generally used to weld smaller diameter fasteners to thin base metals. Since the entire weld cycle is completed in milliseconds, welds can be made without pronounced distortion, burn-through or reverse side discoloration. As long as one end of the fastener is designed for CD welding, CD studs can be manufactured in almost any shape.







Step 1

Step 2

Step 3

Step 4

- 1) The weld gun and stud is positioned against the work plate. No ferrule is needed.
- **2)** Stored energy discharged through special weld "timing" tip and the stud starts downward.
- 3) The stud is forced downward into the pool of molten metal.
- 4) Metal solidifies and weld is completed in a split second.



CD STUD WELDING MATERIAL CAPABILITIES

BASE MATERIAL	STUD MATERIAL				
	MILD STEEL; 1010 - 1030	STAINLESS STEEL 302/304/305	ALUMINUM 1100/5086/6061	BRASS 70-30/65-35	
MILD STEEL: 1006-1030	EXCELLENT	EXCELLENT	NA	EXCELLENT	
MEDIUM CARBON STEEL: 1030-1050	GOOD	GOOD	NA	GOOD	
GALVANIZED SHEET DUCT OR DECKING	EXCELLENT	EXCELLENT	NA	NA	
STRUCTURAL STEEL	EXCELLENT	EXCELLENT	NA	EXCELLENT	
STAINLESS STEEL: 405,410,430, AND 300 SERIES (EXCL. 303)	EXCELLENT	EXCELLENT	NA	EXCELLENT	
LEAD-FREE BRASS, ELECTROLYTIC COPPER, LEAD-FREE ROLLED COPPER	EXCELLENT	EXCELLENT	NA	EXCELLENT	
MOST ALUMINUM ALLOYS OF THE 1000,3000,5000, AND 6000 SERIES 1	NA	NA	EXCELLENT	NA	
DIE-CAST ZINC ALLOYS	GOOD	GOOD	EXCELLENT	GOOD	

¹⁾ OTHER MATERIALS, SUCH AS 7000 SERIES ALUMINUM, TITANIUM ALLOYS, INCONEL, ETC. CAN BE WELDED UNDER SPECIFIED CONDITIONS.
2) GOOD – GENERALLY FULL STRENGTH RESULTS, DEPENDING ON THE COMBINATION OF STUD SIZE AND BASE METAL.

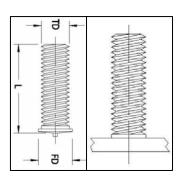
STANDARD LOAD CAPACITIES

STUD MATERIAL	STUD SIZE	MAX. FASTENING TORQUE (INCH/LBS,)	ULTIMATE TENSILE LOAD (LBS.)	MAX. SHEAR LOAD (LBS.)
	6-32	6.0	500	375
LOW-CARBON	8-32	12.0	765	575
COPPER FLASHED	10-24	14.0	960	720
STEEL	1/4-20	43.0	1,750	1,300
SIEEL	5/16-18	72.0	2,900	2,200
	3/8-16	106.0	4,300	3,250
	6-32	10.0	790	590
	8-32	20.0	1,260	940
STAINLES STEEL: 304	10-24	23.0	1,530	1,150
STAINLES STEEL. 304	1/4-20	75.0	2,880	2,160
	5/16-18	126.0	3,750	5,350
	3/8-16	186.0	4,850	7,150
	6-32	2.5	200	125
	8-32	5.0	295	185
ALUMINUM ALLOY:	10-24	6.5	380	235
1100	1/4-20	21.5	670	415
1100	5/16-18	36.0	1,125	695
	3/8-16	53.0	1,660	1,000
	6-32	3.5	375	235
	8-32	7.5	585	365
ALUMINUM ALLOY:	10-24	10.0	735	460
5086	1/4-20	32.5	1,360	850
	5/16-18	54.5	2,300	1,400
	3/8-16	81.0	3,400	2,100
	6-32	8.0	600	390
	8-32	16.0	860	560
DDACC. 70 00 05 05	10-24	18.5	1,040	680
BRASS: 70-30, 65-35	1/4-20	61.0	1,950	1,275
	5/16-18	102.0	3,280	2,140
	3/8-16	150.0	4,800	3,160

^{*}MAXIMUM FASTENING TORQUE SHOULD DEVELOP FASTENER TENSION TO SLIGHTLY LESS THAN YIELD POINT.



TRU-WELD Stud Welding



TYPE CD STUD

FULLY THREADED CAPACITOR DISCHARGE STUD – FLANGED NO FERRULE NEEDED

	WELD STUD SPECIFICATIONS				
TD Diameter and Thread Pitch	L Min. Length before weld	TRU-WELD Part Number	FD Flange Diameter		
#4-40	.250	CDEC-004-541	.187		
#6-32	.250	CDGC-004-541	.218		
#8-32	.250	CDIC-004-541	.250		
#10-32	.250	CDKF-004-541	.250		
#10-24	.250	CDKC-004-541	.250		
1/4-20	.375	CD04-006-541	.312		
5/16-18	.500	CD05-008-541	.375		
3/8-16	.500	CD06-008-541	.437		

CD STUDS ARE AVAILABLE IN VARIOUS LENGTHS, DIAMETERS, AND MATERIALS (TOO MANY TO LIST HERE)

PART NUMBERING CODES (CD STUDS)

PREFIX (IST FOUR DIGITS OR CHARACTERS)

CDEC = #4 CDKC= #10 CDGC = #6 CD04 = 1/4 CDIC = #8 CD05 = 5/16

SUFFIX (LAST THREE DIGITS)

FLANGE/NON-FLANGE (5 OR 6) TIP/NO TIP (4 OR 0) MATERIAL (1, 2, 3)

1 – MILD STEEL

2 – STAINLESS STEEL

3 - ALUMINUM

MATERIAL

MILD STEEL, STAINLESS STEEL, ALUMINUM, BRASS

PLATING

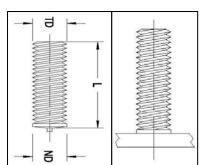
ALL MILD STEEL STUDS ARE COPPER PLATING (NICKEL PLATING AVAILABLE UPON REQUEST ANNEALING

ALL STUDS ARE ANNEALED WHERE REQUIRED

	ESTIMATED WEIGHTS OF THREADED CD STUDS IN POUNDS PER 1000 PIECES					
LENGTH	#4-40	#6-32	#8-32	#10-24	1/4-20	5/16-18
1/4	.69	1.00	1.39	1.79	3.08	4.90
3/8	.94	1.38	1.93	2.50	4.37	6.98
1/2	1.18	1.76	2.49	3.21	5.66	9.06
5/8	1.43	2.13	3.04	3.93	6.95	11.13
3/4	1.67	2.51	3.60	4.64	8.24	13.21
7/8	1.92	2.89	4.15	5.35	9.52	15.29
1	2.16	3.26	4.71	6.07	10.81	17.36
1-1/4	2.65	4.02	5.82	7.50	13.39	21.52
1-1/2	3.15	4.77	6.93	8.92	15.96	25.67
1-3/4	3.64	5.52	8.04	10.35	18.54	29.83



TRU-WELD Stud Welding



TYPE CD STUD

FULLY THREADED CAPACITOR DISCHARGE STUD – NON-FLANGED NO FERRULE NEEDED

l		WELD STUD SPECIFICATIONS					
	TD Diameter and Thread Pitch	meter and Min. Length Part Number		ND Nominal Diameter			
	#4-40	.250	CDEC-004-641	.112			
	#6-32	.250	CDGC-004-641	.138			
	#8-32	.250	CDIC-004-641	.164			
	#10-32	.250	CDKF-004-641	.190			
	#10-24	.250	CDKC-004-641	.190			
	1/4-20	.375	CD04-006-641	.250			
	5/16-18	.500	CD05-008-641	.312			
	3/8-16	.500	CD06-008-641	.375			

CD STUDS ARE AVAILABLE IN VARIOUS LENGTHS, DIAMETERS, AND MATERIALS (TOO MANY TO LIST HERE)

PART NUMBERING CODES (CD STUDS)

PREFIX (IST FOUR DIGITS OR CHARACTERS)

CDEC = #4 CDKC= #10 CDGC = #6 CD04 = 1/4 CDIC = #8 CD05 = 5/16

SUFFIX (LAST THREE DIGITS)

FLANGE/NON-FLANGE (5 OR 6) TIP/NO TIP (4 OR 0) MATERIAL (1, 2, 3)

- 1 MILD STEEL
- 2 STAINLESS STEEL
- 3 ALUMINUM

MATERIAL

MILD STEEL, STAINLESS STEEL, ALUMINUM, BRASS

PLATING

ALL MILD STEEL STUDS ARE COPPER PLATING (NICKEL PLATING AVAILABLE UPON REQUEST

ANNEALING

ALL STUDS ARE ANNEALED WHERE REQUIRED

	ESTIMATED WEIGHTS OF THREADED CD STUDS IN POUNDS PER 1000 PIECES					
LENGTH	#4-40	#6-32	#8-32	#10-24	1/4-20	5/16-18
1/4	.69	1.00	1.39	1.79	3.08	4.90
3/8	.94	1.38	1.93	2.50	4.37	6.98
1/2	1.18	1.76	2.49	3.21	5.66	9.06
5/8	1.43	2.13	3.04	3.93	6.95	11.13
3/4	1.67	2.51	3.60	4.64	8.24	13.21
7/8	1.92	2.89	4.15	5.35	9.52	15.29
1	2.16	3.26	4.71	6.07	10.81	17.36
1-1/4	2.65	4.02	5.82	7.50	13.39	21.52
1-1/2	3.15	4.77	6.93	8.92	15.96	25.67
1-3/4	3.64	5.52	8.04	10.35	18.54	29.83



6400 N. Honeytown Road Smithville, Ohio 44677

(330) 725-7744 Phone (330) 669-2473 Fax

CAPACITOR DISCHARGE PIN WELDER





Pin Welder Description

Model: TWP-2

Incorporates the latest solid state technology into a compact and rugged, portable CD Pin Welder. This system has the capacity to weld pins (including cupped 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
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 2.0 05/09/2013

- 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.

^{**} Specifications are subject to change without prior notice



6400 N. Honeytown Road Smithville, Ohio 44677

(330) 725-7744 Phone (330) 669-2473 Fax

CAPACITOR DISCHARGE STUD WELDER





Model: TWE-250

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

Version 2.0 05/09/2013

- 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.

^{**} Specifications are subject to change without prior notice



6400 N. Honeytown Road Smithville, Ohio 44677

(330) 725-7744 Phone (330) 669-2473 Fax

CAPACITOR DISCHARGE STUD WELDER





Model: TWE-321 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

Version 2.0 05/09/2013

- 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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6400 N. Honeytown Road Smithville, Ohio 44677

(330) 725-7744 Phone (330) 669-2473 Fax

CAPACITOR DISCHARGE STUD WELDER





Model: TWE-375

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

Version 2.0 05/09/2013

- 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 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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(330) 725-7744 Phone (330) 669-2473 Fax

CAPACITOR DISCHARGE STUD WELDER





Model: TWE250PC-12

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-guage through 1/4" full flanged stainless steel studs.

SPECS	TWE250PC-12
SIZE	15-3/4" Length, 8" Width, 9" Height
WEIGHT	26 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

Version 1.1 11/09/2012

** Specifications are subject to change without prior notice

- 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 minimizes the opportunity of the components coming loose during handling or operations.
- High-Impact case, rugged carrying case
- 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.
- The TWE CD Unit weighs less than most other available models for ease or carrying.



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Notes:



A Division of Tru-Fit Products Corporation 460 Lake Road Medina, OH 44256 www.tfpcorp.com

Remit To;

Tru-Fit Products Corporation 460 Lake Road Medina, Ohio 44256 (330) 725-7741 Phone (330) 725-0161 Fax Trufit@tfpcorp.com



MADE IN AMERICA