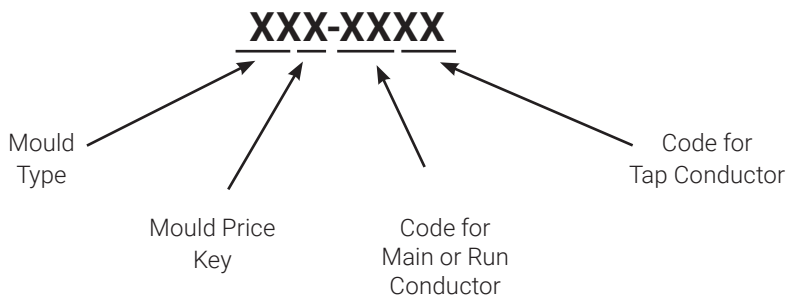
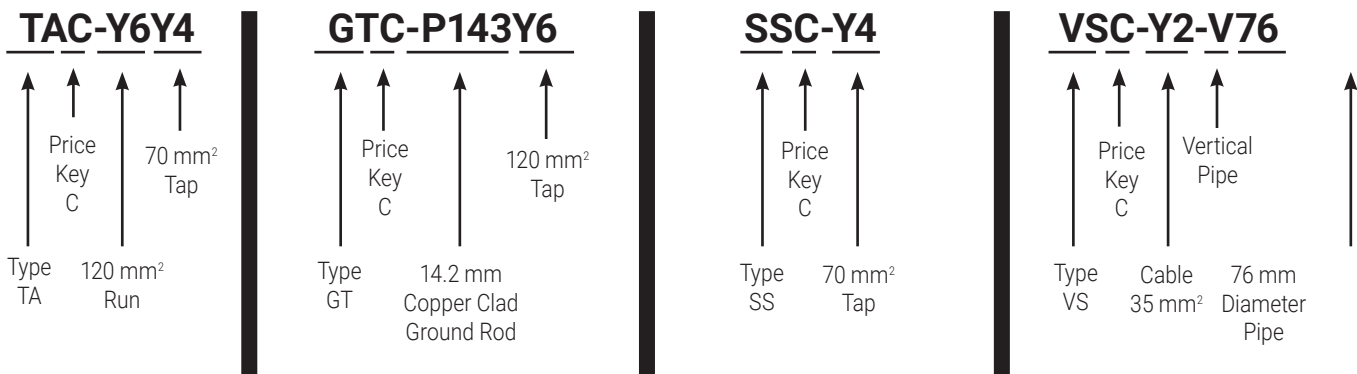


The Cadweld Mould Numbering System

The Cadweld Mould Part Number gives, in code, the complete information of the mould
– type of connection, mould price key, and conductor size(s).



EXAMPLES



CERTAIN TOOLS MAY BE REQUIRED FOR VARIOUS CONNECTIONS.

If required, these tools are listed on the same page as the connection and in Section A.

- Some tools listed in Section A can save you a lot of time.
- Also refer to A9E, Contractor Tips, to make your job easier, and learn about labor saving ideas.

For other Cadweld literature, videos and software, visit nVent.com/ERICO

REQUIRED TOOLS SUMMARY

Required tools are listed with each mould. For your reference, handle clamps and/or frame are summarized below.

MOULD	REQUIRED
A*	Includes frame with handle
C, Q & R	Requires L160
D, F & Z	Requires L159
E*	Includes frame but also requires L160
J*	Includes frame but also requires L159
K*, M* & V*	Includes frame with handles

* To order mould only - without handles or frame - add suffix "M" to mould part number.

The Cadweld Mould Numbering System

COMMON REFERENCE FOR CABLE DIAMETERS

Concentric Cable			
Nominal Area (mm ²)	Strand	Diameter Range (mm)	Cable Size Code
6	7/1.07	3,21	A7
10	7/1.37	4,12	W2
16	7/1.73	5,18	W3
25	7/2.16	6,48	Y1
25	19/1.32	6,60	Y1
35	7/2.54	7,62	Y2
35	19/1.55	7,75	Y2
50	19/1.85	9,27	Y3
70	19/2.18	10,90	Y4
95	19/2.57	12,80	Y5
95	37/1.83	12,80	Y5
120	37/2.03	14,21	Y6
120	19/2.84	14,20	Y6
150	37/2.29	16,00	Y7
185	37/2.54	19,80	Y8
240	37/2.90	20,30	Y9
300	61/2.51	22,60	Y0

For other cable sizes or different stranding, please contact your local Cadweld distributor, agent or nVent.

BUSBAR / TAPE KEY

Thickness (mm)	CADWELD Code	Width (mm)	CADWELD Code
2	BA	20	H
3	CA	25	J
3,5	DA	30	K
4	EA	35	V
5	FA	40	L
6	PA	50	M
8	GA	60	N
10	HA	80	P
		100	Q

GROUND RODS

Size	CADWELD Code
7 mm	P070
10 mm	P100
12.7 mm	P128
14 mm	P140
14.2 mm	P143
15 mm	P150
16 mm	P160
17.2 mm	P172
19 mm	P190
20 mm	P200

REBAR

Size	CADWELD Code
10 mm	51
12 mm	52
16 mm	53
20 mm	92
22 mm	55
25 mm	56
32 mm	58
36 mm	59
40 mm	83

Metric to Imperial Conversion Chart

METRIC CABLES				US EQUIVALENT			
Area Cross sectional area mm² (SQMM)	Metric Cable Code	Diameter		AWG/MCM Size	AWG/MCM Cable Code	Diameter	
		mm	Inch			Inch	mm
2.0 Concentric	–	1.8	0.071	#14 Concentric	–	0.0726	1.84
3.5 Concentric	G8	2.4	0.095	#12 Concentric	–	0.0915	2.3
w/B1331H sleeve (0.106 ID) - (2.69 mm)				–	–	–	–
4 Solid	G9	2.5	0.0984	#10 Solid	1A	0.102	2.6
6 Solid	H5	3.1	0.122	#8 Solid	1D	0.128	3.25
5.5 Concentric	B5	3.0	0.118	#10 Concentric	1B	0.116	2.95
w/B1331K sleeve (0.140 ID) - (3.56 mm)				–	–	–	–
8.0 Concentric	E0	3.6	0.142	#8 Concentric	1E	0.146	3.7
10 Solid	–	3.8	0.150	#6 Solid	1G	0.162	4.1
10 Concentric	W2	4.2	0.162	#7 Concentric	7L	0.164	4.2
14 Concentric	B0	4.8	0.189	#6 Concentric	1H	0.184	4.7
w/B1331H sleeve (0.106 ID) - (5.38 mm)				–	–	–	–
16 Solid	–	4.5	0.177	#4 Solid	1K	0.204	5.2
16 Concentric	W3	5.2	0.204	#5 Concentric	3Y	0.205	5.2
22 Concentric	A8	6.0	0.236	#4 Concentric	1L	0.232	5.9
25 Solid	W5	5.6	0.220	#3 Solid	1P	0.229	5.8
25 Concentric	Y1	6.4	0.260	#3 Concentric	1Q	0.260	6.6
25 Ropelay	X1	–	–	–	–	–	–
30 Concentric	A6	6.9	0.276	#2 Concentric	1V	0.292	7.4
35 Solid	W7	6.7	0.264	#2 Solid	1T	0.258	6.6
35 Concentric	Y2	7.7	0.305	#2 Concentric	1V	0.292	7.4
35 Ropelay	X2	–	–	–	–	–	–
38 Concentric	D5	7.8	0.315	#2 Concentric	1V	0.292	7.4
40 Concentric	E5	8.4	0.331	#1 Concentric	1Y	0.332	8.4
50 Solid	W6	8.0	0.315	1/0 Solid	2B	0.325	8.3
50 Concentric	Y3	9.0	0.354	1/0 Concentric	2C	0.373	9.5
50 Ropelay	X3	–	–	–	–	–	–
55 Concentric	G5	9.6	0.378	1/0 Concentric	2C	0.373	9.5
60 Concentric	L9	10.0	0.394	2/0 Concentric	2G	0.419	10.6
70 Solid	W8	10.0	0.394	3/0 Solid	2K	0.410	10.4
70 Concentric	Y4	10.9	0.430	2/0 Concentric	2G	0.419	10.6
70 Ropelay	–	–	–	–	–	–	–
80 Concentric	R4	11.5	0.453	3/0 Concentric	2L	0.470	12.0
95 Concentric	Y5	12.6	0.505	4/0 Concentric	2Q	0.528	13.4
95 Ropelay	X5	–	–	–	–	–	–
100 Concentric	X4	13.0	0.512	4/0 Concentric	2Q	0.528	13.4
120 Concentric	Y6	14.2	0.567	250MCM	2V	0.575	14.6
120 Ropelay	X6	–	–	–	–	–	–
125 Concentric	R6	14.5	0.571	250MCM	2V	0.575	14.6
150 Concentric	Y7	16.1	0.634	300MCM	3A	0.630	16.0
150 Ropelay	X7	–	–	–	–	–	–
160 Concentric	V7	–	–	–	–	–	–
185 Concentric	Y8	17.7	0.700	350MCM	3D	0.681	17.3
185 Ropelay	X8	–	–	–	–	–	–
200 Concentric	D7	18.2	0.717	400MCM	3H	0.728	18.5
240 Concentric	Y9	20.3	0.801	500MCM	3Q	0.813	20.7
240 Ropelay	X9	–	–	–	–	–	–
250 Concentric	V9	20.7	0.815	500MCM	3Q	0.813	20.7
300 Concentric	Y0	22.5	0.891	600MCM	3X	0.893	22.7
300 Ropelay	X0	–	–	–	–	–	–
315 Concentric	V0	–	–	–	–	–	–
325 Concentric	S4	23.4	0.922	700MCM	4G	0.964	24.5
400 Concentric	V1	26.2	1.03	800MCM	4Q	1.031	26.2
400 Ropelay	V6	–	–	–	–	–	–
500 Concentric	P9	28.8	1.13	1000MCM	4Y	1.152	29.3
500 Ropelay	W4	–	–	–	–	–	–
600 Concentric	R9	31.9	1.26	1200MCM	5G	1.263	32.1
625 Concentric	W9	32.8	1.29	1250MCM	5J	1.289	32.7
625 Ropelay	W0	–	–	–	–	–	–
725 Concentric	R0	35.2	1.39	1400MCM	5Q	1.364	34.6
800 Concentric	X8	36.8	1.45	1600MCM	5X	1.459	37.1
800 Ropelay	V2	–	–	–	–	–	–
850 Concentric	Q1	37.6	1.48	1700MCM	7G	1.506	38.2
1000 Concentric	V3	41.6	1.64	2000MCM	7G	1.632	41.5
1000 Ropelay	V4	–	–	–	–	–	–

F.1 - Metric Cable Sizes and Code, in Square Millimeters (MM2), abbrev. (QMM)

Cadweld - Technical Advantages

THE CADWELD WELD

- Has a current-carrying capacity equal to that of the conductor
- Creates a permanent bond that withstands repeated fault currents and will not loosen, deteriorate or increase in resistance
- Consistently performs the best in independent IEEE® 837 tests
- Is easy to check visibly for quality

RELIABILITY

As the molecular bond eliminates the concept of surface contact, an electrolyte cannot penetrate between the conductors and cause oxidation and deterioration in the course of time.

CORROSIVE ENVIRONMENTS

This reliability is of particular interest for humid or chemical environments or for bonds directly buried in the ground.

ABILITY TO WITHSTAND HIGH CURRENT

The melting temperature of Cadweld connection is higher than the melting temperature of copper (1082°C). For this reason, in the event of abnormal heating due to a high fault current, the conductor is destroyed before the connection.

CONDUCTIVITY

The Cadweld connections form a solid bond around the conductors assuring continuity. The cross sectional area of the weld has greater current carrying capacity than the conductors.

PERFORMANCE

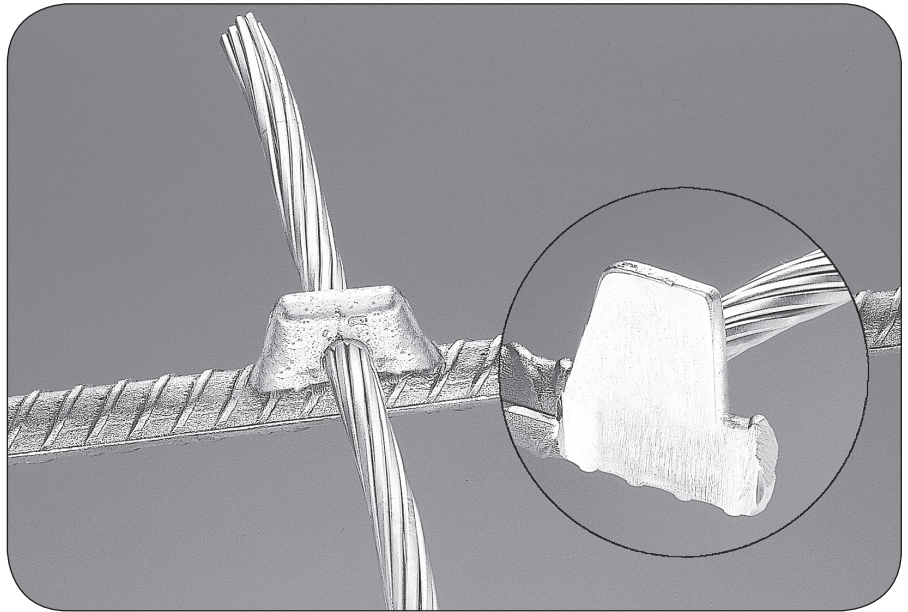
Standard Cadweld welds have a cross section greater than that of the conductors to be joined, which compensates for the difference in resistivity between the conductor and the welding material.

Consequently, under fault conditions the weld will always remain cooler than the conductor.

If special applications do not allow for the required increase in cross section to be employed, the use of the formula:

$$R = \frac{\rho \times l}{S} \text{ and } V = R \times I$$

will make it possible to define precisely the resistance of the Cadweld weld.



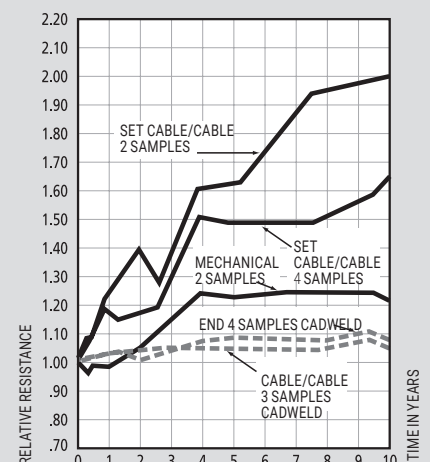
CORROSION TEST

This accelerated ageing test, carried out in a saline environment at a controlled temperature, demonstrates that Cadweld welds retain all their electrical properties during the period of the test whereas the resistance of mechanical connections increase with time and this alters their conductive properties.

Cadweld's exceptional performance is due to its reliability resulting from the molecular bond.

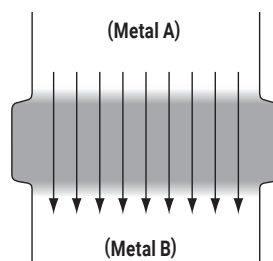
Comparison between Cadweld Bonded Connection and Mechanical Connection Cadweld Weld (Metal A) (Metal B).

The Cadweld bonded connection provides permanent conductivity over the whole of the section due to molecular bonding between the metal surfaces.



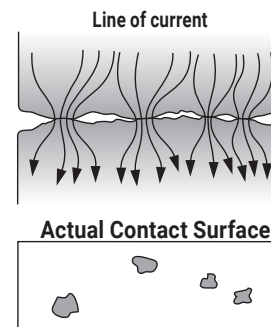
Comparison between Cadweld Bonded Connection and Mechanical Connection

CADWELD WELD



The Cadweld bonded connection provides conductivity over the whole of the section due to molecular bonding between the metal surfaces.

MECHANICAL CRIMPED CONNECTION



The mechanical connection presents a significant difference between the apparent contact surface and the actual surface.

Cadweld - Technical Advantages

GROUNDING SYSTEM – CONDUCTORS AND CONNECTORS

The grounding conductor size is based on the maximum magnitude and duration of available fault current, and on the type of connections being used in the grounding system.

IEEE® Std. 80-1986, Guide for Safety in Substation Grounding, uses a fusing formula as the basis for selecting minimum conductor size to avoid fusing (melting) under fault conditions.

This formula can be simplified to the following:

$$A = K \cdot I \sqrt{S}$$

Where: **A** = Conductor size in mm²
K = Constant from the following table
I = RMS fault current in amperes
S = Fault time in seconds

Based on the standard ambient temperature of 40° C.

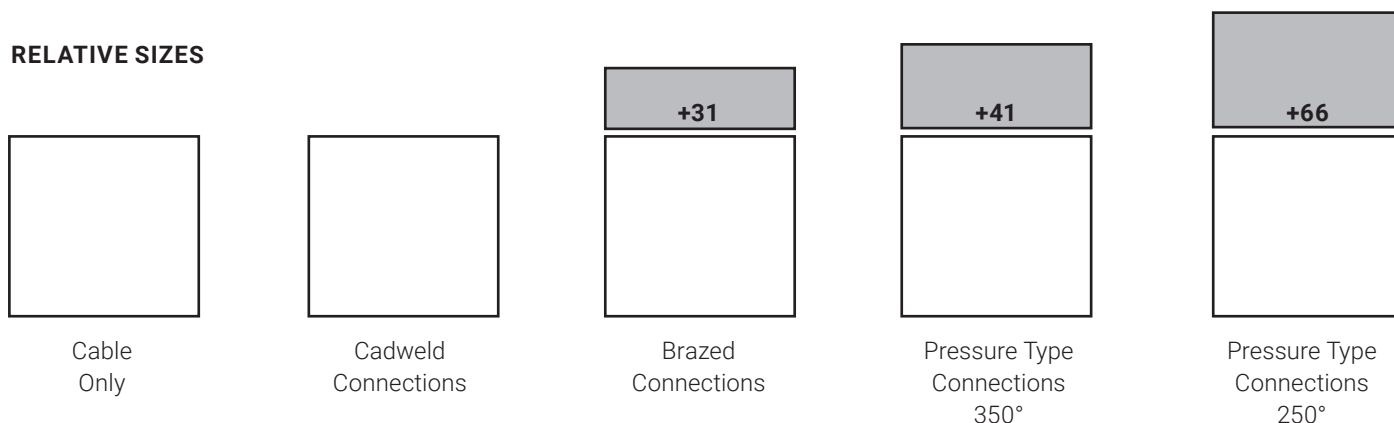
MAX TEMP	CONSTANT K FOR ABOVE FORMULA		
	COPPER (Soft Drawn)	COPPERWELD (Dead Soft Annealed) 40%	COPPERWELD (Dead Soft Annealed) 30%
1083° C	3.55	5.30	6.10
450° C	4.65	6.96	8.04
350° C	5.12	7.67	8.85
250° C	5.90	8.85	10.22

The temperatures listed above for each material are specified in IEEE Std. 80-1986 to be used for different types of connecting means;

Pressure type connectors 250° to 350° C*
 Brazed connections 450° C
 Exothermic welded connections 1083° C

*Except those that have been tested to and passed the requirements of IEEE Std. 837-1989.

RELATIVE SIZES



EXAMPLE – 25,000 Ampere, 2 second fault:

CONNECTION TYPE

Cadweld Electrical

Brazed

Pressure Type (at 350° C)

Pressure Type (at 250° C)

CONDUCTOR SIZE

126 mm² - use 150 mm²

164 mm² - use 185 mm²

181 mm² - use 185 mm²

209 mm² - use 240 mm²

Technical Information

CADWELD THE MOLECULAR BOND

CADWELD EXOTHERMIC CONNECTION

A WELDING PROCESS THAT ELIMINATES THE CONNECTION BY FORMING A MOLECULAR BOND.

Connections are the weak point of all electrical circuits and especially earthing circuits subjected to aging and corrosion. The capacity of an earthing circuit to protect the safety of personnel depends on the quality of the connections made.

BS 6651 (1992) STATES :

"Any joint other than welded represents a discontinuity in the current conducting system and is susceptible to variation and failure."

CADWELD – THE MOLECULAR BOND

The Cadweld process provides a way to produce copper/copper, copper/galvanized or plain steel, copper/copper clad steel, copper/bronze/brass/stainless steel, steel/steel, molecular bonds with no external energy or heat source.

The principle consists of bringing together a welding materials and ignition agent in a suitable graphite mould.

The reduction of copper oxide by aluminium produces molten copper and aluminium oxide slag at extremely high temperatures.

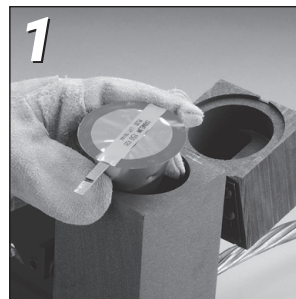
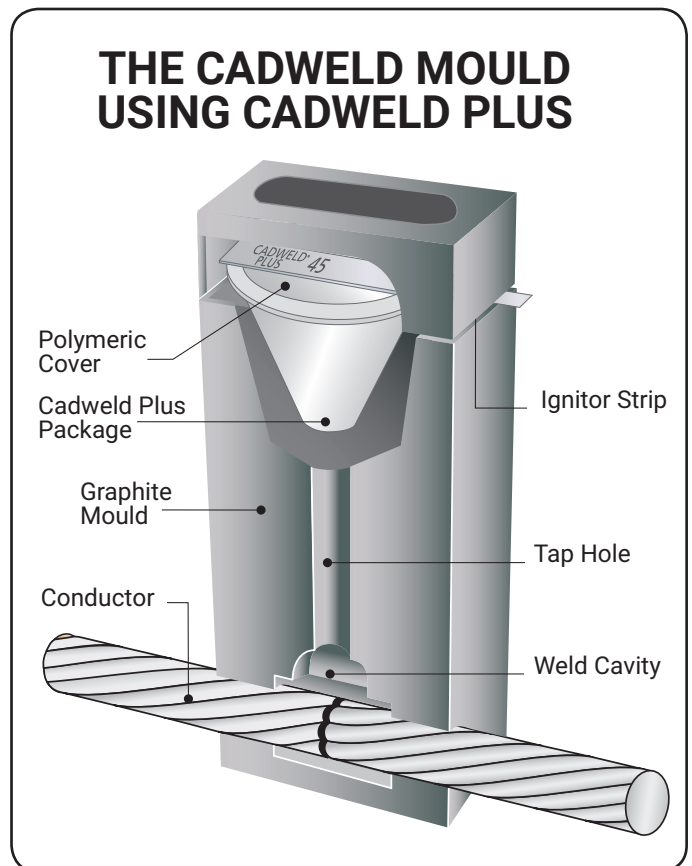
The shape of the mould, its dimensions, and the size of the welding material, are all dependent on the items to be welded.

INSTALLATION IS EASY!

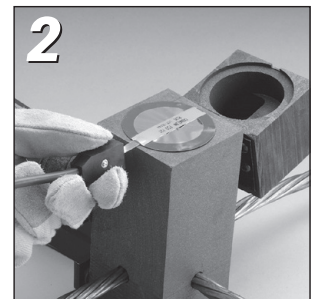
4 SIMPLE STEPS FOR PERMANENTLY WELDED ELECTRICAL CONNECTIONS

The Cadweld Plus Control Unit initiates the reaction of the metal crucible. The standard unit includes a 1.8 meter (6-foot) high temperature control unit lead. The lead attaches to the ignition strip using a custom made, purpose-designed termination clip.

After the termination clip is installed on the ignition strip, the installer pushes and holds the ignition button to start a charging and discharging sequence. Within a few seconds the control unit sends a predetermined voltage to the ignition strip and the reaction is initiated.



1
Insert Cadweld Plus package into mould



2
Attach control unit termination clip to ignition strip



3
Press and hold operating switch and wait for the ignition



4
Open the mould and remove the expended steel cup – no special disposal required

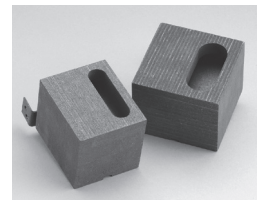
Cadweld Plus

CADWELD PLUS FOR GROUNDING APPLICATIONS

Article Number	Article Number	Size Identification Ring Color	Traditional Welding Material Part Number (Clear Cap)	Box Qty.
165700	165700	Black	15	20
165701	165701	Red	25	20
165702	165702	White	32	20
165703	165703	Light Blue	45	20
165704	165704	Dark Green	65	20
165705	165705	Gray	90	10
165706	165706	Orange	115	10
165707	165707	Dark Blue	150	10
165708	165708	Yellow	200	10
165709	165709	Purple	250	10
165710	165710	Light Green	use 2 x 150	10
165711	165711	Brown	use 2 x 200	10
165712	165712	Light Brown	500	10



PLUSCU



Baffle Cover Kit



PLUSCULD

Cadweld Plus Patent Numbers 6,553,911 6,835,910 6,703,578

CADWELD PLUS FOR GROUNDING APPLICATIONS

Cadweld Plus Part Number	Article Number	Size Identification Ring Color	Traditional Welding Material Part Number (Orange Cap)	Box Qty.
25PLUSXF19	165718	Red	25XF19	20
32PLUSXF19	165719	White	32XF19	20
45PLUSXF19	165720	Light Blue	45XF19	20
65PLUSXF19	165721	Dark Green	65XF19	20

Gram weight PLUS welding material type **i.e. 45PLUSF20**

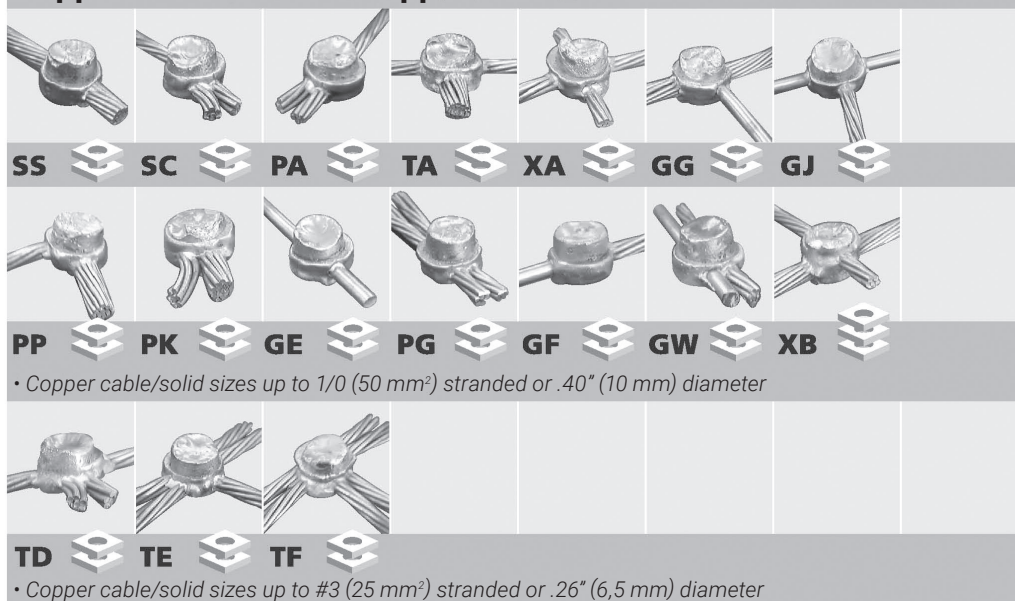
ACCESSORIES

Part Number	Article Number	Description
PLUSCU	165738	Cadweld Plus Control Unit
PLUSCU15L	165745	Cadweld Plus Control Unit with 4.6 meters (15 ft.) Lead
PLUSCULD	165739	Control Unit Replacement Lead 1.8 meters (6 ft.)
PLUSCULD15	165746	Control Unit Replacement Lead 4.6 meters (15 ft.)
MC2X2KIT	165740	Kit, Baffle Cover, Graphite - 51 mm X 51 mm (2" X 2") Mould
MC25X3KIT	165744	Kit, Baffle Cover, Graphite - 64 mm X 76 mm (2 1/2" X 3") Mould
MC3X3KIT	165741	Kit, Baffle Cover, Graphite - 76 mm X 76 mm (3" X 3") Mould
MC4X4KIT	165742	Kit, Baffle Cover, Graphite - 102 mm X 102 mm (4" X 4") Mould

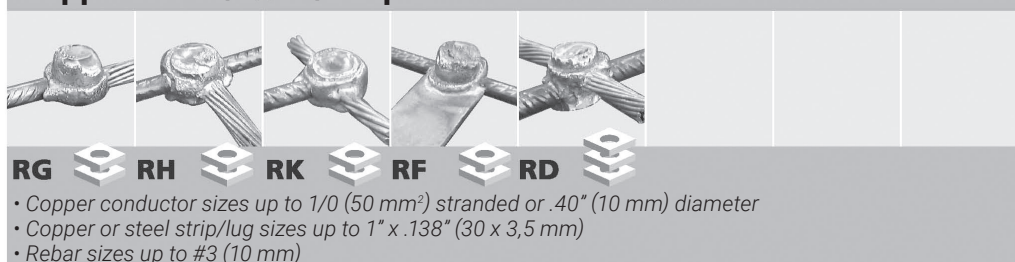
Cadweld Multi

CADWELD MULTI CONNECTION CAPABILITIES

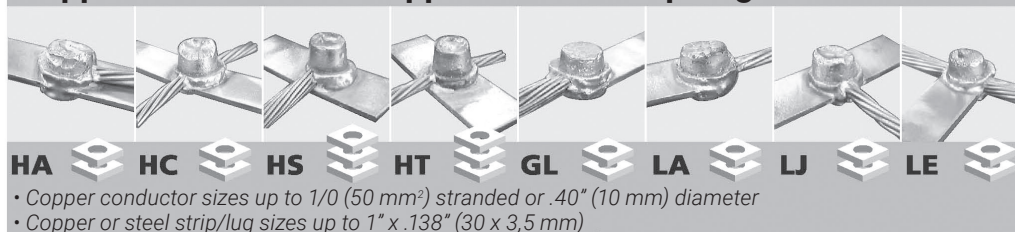
Copper Cable/Solid to Copper Cable/Solid



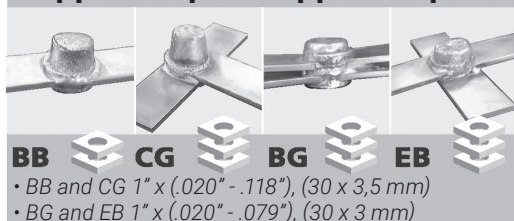
Copper Cable/Solid/Strip to Rebar



Copper Cable/Solid to Copper or Steel Strip/Lug



Copper Strip to Copper Strip

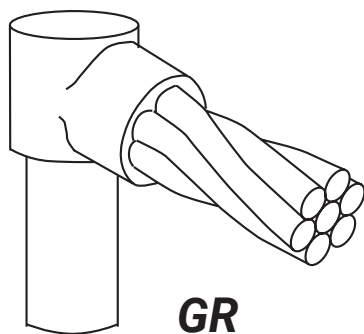


Galvanized Steel Strip to Galvanized Steel Strip



Cable to Ground Rod

GR



GR

GROUND ROD SIZE Dia. (mm)	CABLE SIZE (sq mm)	MOULD PART NO.	WELDING MATERIAL ¹
12.7	25	GR CP 128Y1	65
	35	GR CP 128Y2	65
	50	GR CP 128Y3	65
	70	GR CP 128Y4	90
	95	GR CP 128Y5	90
	120	GR CP 128Y6	90
	150	GR CP 128Y7	115
	185	GR CP 128Y8	115
14.2	25	GR CP 143Y1	65
	35	GR CP 143Y2	90
	50	GR CP 143Y3	90
	70	GR CP 143Y4	90
	95	GR CP 143Y5	90
	120	GR CP 143Y6	90
	150	GR CP 143Y7	115
	185	GR CP 143Y8	150
17.2	240	GR CP 143Y9	250
	25	GR CP 173Y1	90
	35	GR CP 173Y2	90
	50	GR CP 173Y3	90
	70	GR CP 173Y4	90
	95	GR CP 173Y5	90
	120	GR CP 173Y6	90
	150	GR CP 173Y7	115
	185	GR CP 173Y8	115
	240	GR CP 173Y9	150

¹For Cadweld Plus add suffix "PLUSF20" (refer page 8)

CABLE TO GROUND ROD

- Single cable to top of ground rod. Concentric strand copper cable unless otherwise noted. For copperclad, galvanized, stainless clad or stainless steel ground rods.
- **Bold letter** in mould part number is the price key.

REQUIRED TOOLS

	Article No.	Part No.
Handle Clamps		
for C Price Key Moulds	161000	L160
for D Price Key Moulds	161020	L159
Cadweld Plus Control Unit or	165738	PLUSCU
Flint Ignitor	165000	T320

SUGGESTED TOOLS

Conductor Cleaning Brush	165130	T313
Slag Removal Spade		
#65 w/m & smaller	182125	B136A
#90 w/m & larger	182130	B136B
Mould Cleaning Brush	165260	T394
Cable Clamp	165020	B265
File	165260	T329
Torch Head	140160	T111