PENTAIR

# CADWELD WELDED ELECTRICAL CONNECTIONS

## FOR COPPER-CLAD STEEL CONDUCTORS

ERICO

# Table of Contents

# Copper-Clad Steel (CCS) Conductors

Copper-Clad Steel (CCS) conductors are composed of a steel core with a continuous and constant copper cladding that is thoroughly bonded throughout. CCS conductors combine the strength of steel with the high conductivity and corrosion resistance of copper.

CADWELD welded electrical connections have been used to join CCS conductors for over 40 years. The CADWELD exothermic process fuses the CCS conductors together to form a connection that will not corrode, loosen, or increase in resistance for the intended service life of the installation. CCS conductors may also be welded to copper conductors, rebar or any other horizontal or vertical steel surface or structure for electrical grounding.

CADWELD welded electrical connections are preferable to mechanical connections for CCS conductors. Mechanical connections rely on the deformation of the conductors and the pressure exerted by the connector on the conductor to reduce the contact resistance. Since the core of CCS conductors is steel, a CCS conductor will not deform as much as a pure copper conductor and therefore an exothermically welded connection is better suited for this application.

# How to Order CADWELD Products

This catalog lists the most popular CADWELD connections for CCS construction. Look in the index for the connection you need. If you cannot find the connection you need, contact Pentair or your local distributor or agent.

### 1. What connection do you require?

Available connections are listed in the pictorial index, which also shows the degree of difficulty in making the connection, and ease of mold cleaning. We strongly recommend that wherever possible you use molds listed in this catalog. After selecting the connection, turn to the appropriate page and select the mold, welding material and tools you need.

### 2. What are the conductor sizes?

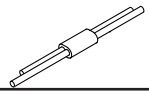
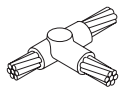
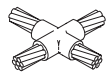
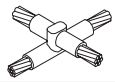
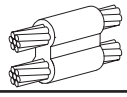
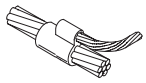
This catalog covers connections between CCS conductors to each other, to concentric stranded copper cable, to lugs, to ground rods, to rebar, and to rail. For sizes not listed, contact Pentair or your local distributor or agent.

**Note:** Other Pentair catalogs describe connections to conductors for solid or concentric stranded copper conductors, busbar, lightning protection cable, steel cable, etc.

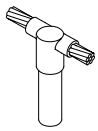
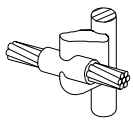
### 3. You must have the following to make a weld:

1. CADWELD engineered mold.
2. Welding material required by your mold.
3. Handle clamps and or frame.
4. CADWELD PLUS control unit or flint ignitor.
5. Lugs, sleeves, packing material listed on the page with the mold as required.

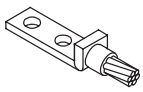
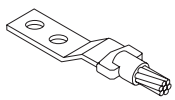
## CABLE TO CABLE

| Name | Page | Type | | Ease | Split |
|---|---|---|---|---|---|
| Horizontal Splice | 5 | SS |  | 1 | Vertical |
| Horizontal Tee | 6 | TA |  | 1 | Horizontal |
| Horizontal X, Same Plane | 9 | XA |  | 1 | Horizontal |
| Horizontal X | 9 | XB |  | 1 | Horizontal |
| Parallel Tap | 10 | PT |  | 1 | Vertical |
| Horizontal Parallel | 11 | PC |  | 1 | Vertical |

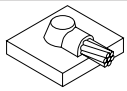
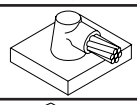
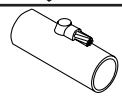
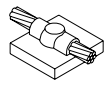
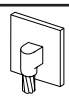
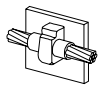
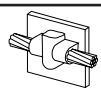
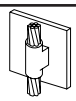
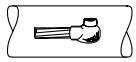
## CABLE TO GROUND ROD

| Name | Page | Type | | Ease | Split |
|---|---|---|---|---|---|
| Ground Rod Splice | 12 | GB |  | 1 | Vertical |
| Cable to Ground Rod - Tap | 13 | GR |  | 1 | Vertical |
| Cable to Ground Rod - Through | 15 | GT |  | 1 | Vertical |
| Cable to Ground Rod - Through / Side | 17 | GY |  | 1 | Vertical |

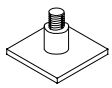
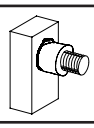
## CABLE TO LUG

| Name | Page | Type | | Ease | Split |
|---|---|---|---|---|---|
| Cable to Lug | 28 | GL |  | 1 | Vertical |
| Cable to Lug | 29 | LA |  | 1 | Horizontal |

## CABLE TO STEEL

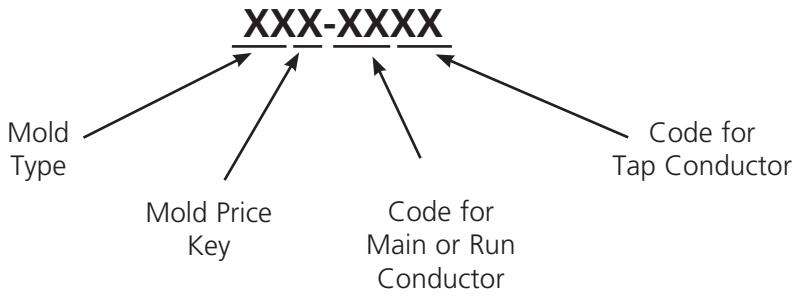
| Name | Page | Type | | Ease | Split |
|---|---|---|---|---|---|
| Horizontal Steel Surface | 19 | HA |  | 1 | * |
| Horizontal Steel Surface | 19 | HS |  | 1 | * |
| Horizontal Steel Pipe | 20 | HA, Pipe |  | 1 | * |
| Horizontal Steel Surface | 21 | HC |  | 1 | * |
| Horizontal Steel Surface | 22 | HT |  | 1 | * |
| Vertical Steel Surface | 22 | VS |  | 1 | Vertical |
| Vertical Steel Pipe | 23 | VS, Pipe |  | | Vertical |
| Vertical Steel Surface | 24 | VF |  | | Vertical |
| Vertical Steel Surface | 24 | VB |  | | Vertical |
| Vertical Steel Surface | 25 | VT |  | | * |
| Vertical Steel Surface | 25 | VG |  | | * |
| Vertical Steel Surface | 26 | VV |  | | Vertical |
| Vertical Steel Surface | 27 | VN |  | | * |

## CABLE TO STUD

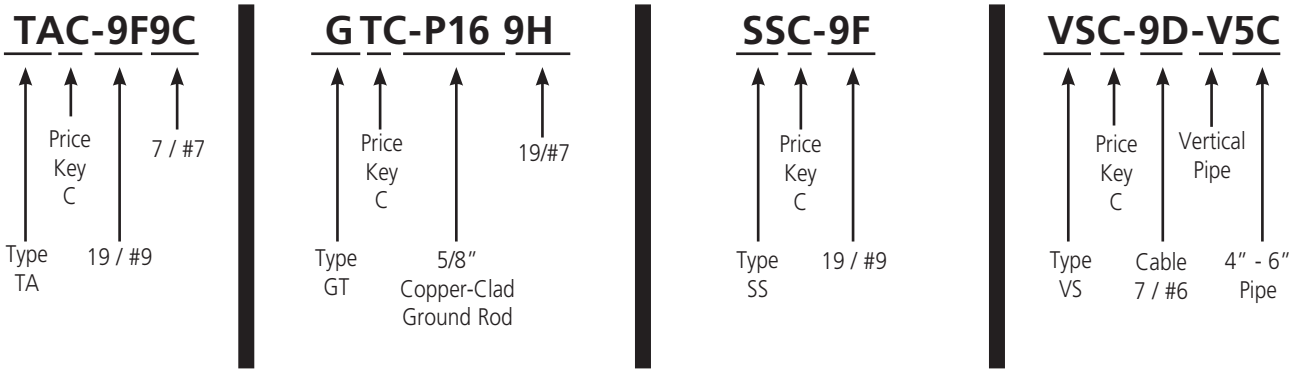
| Name | Page | Type | | Ease | Split |
|---|---|---|---|---|---|
| Steel or Copper Studs to Steel Surface | 31 | HX |  | 1 | Vertical |
| Steel or Copper Studs to Steel Surface | 31 | HV |  | 1 | Horizontal |

# The CADWELD Mold Numbering System

The CADWELD mold part number gives, in code, the complete information of the mold – type of connection, mold price key, and conductor size(s).




## EXAMPLES




## Certain tools may be <u>required</u> 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.

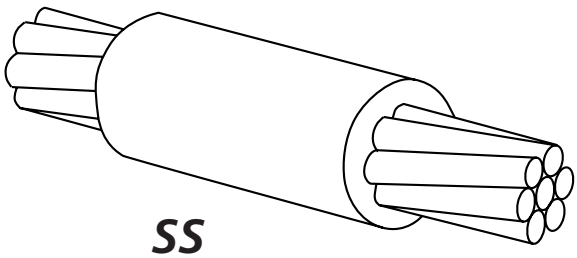
### REQUIRED TOOLS SUMMARY

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

| MOLD | 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 mold only - without handles or frame - add suffix "M" to mold part number.

## *For Stranded Copper-Clad Steel Conductors*



***SS***

### HORIZONTAL SPLICE

- Splice of horizontal cables.
- Concentric stranded copper cable unless otherwise noted.
- Solid conductor may be copper or copper-clad.
- Also available are splices of different and mixed cable sizes. For copper-clad DSA cables, contact Pentair.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | Part No. |
|---|---|
| Handle Clamps | |
| for C Price Key Molds | L160 |
| for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | PLUSCU |
| Flint Ignitor | T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | B136A or B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| Torch Head | T111 |

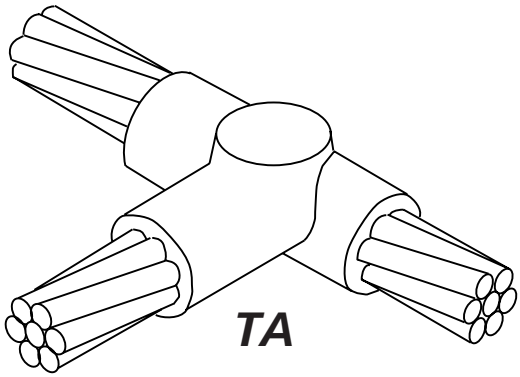
### ACCESSORIES

- See Section A

| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#10 | SS**C**9A | 32 |
| 7/#8 | SS**C**9B | 45 |
| 7/#7 | SS**C**9C | 65 |
| 7/#6 | SS**C**9D | 90 |
| 7/#5 | SS**C**9E | 115 |
| 19/#9 | SS**C**9F | 115 |
| 19/#8 | SS**C**9G | 115 |
| 19/#7 | SS**C**9H | 150 |
| 19/#6 | SS**C**9J | 200 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

## *For Stranded Copper-Clad Steel Conductors*



*TA*

### HORIZONTAL TEE CONNECTIONS

- Tee of horizontal run and tap cables.
- Concentric stranded copper cable unless otherwise noted.
- Solid conductor may be copper or copper-clad.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | | Part No. |
|---|---|---|
| Handle Clamps | for C Price Key Molds | L160 |
| | for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or Flint Ignitor | | PLUSCU T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | B136A or B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| Torch Head | T111 |

### ACCESSORIES

- See Section A

| CABLE SIZE (sq mm) Run | Tap | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|---|
| 7/#10 | 7/#10 | TA**C**9A9A | 45 |
| 7/#8 | 7/#8 | TA**C**9B9B | 65 |
| | 7/#10 | TA**C**9B9A | 45 |
| | 2/0* | TA**C**9B2G | 65 |
| | 4/0* | TA**C**9B2Q | 90 |
| 7/#7 | 7/#7 | TA**C**9C9C | 90 |
| | 7/#8 | TA**C**9C9B | 90 |
| | 7/#10 | TA**C**9C9A | 45 |
| | 2/0* | TA**C**9C2G | 90 |
| | 4/0* | TA**C**9C2Q | 115 |
| 7/#6 | 7/#6 | TA**C**9D9D | 115 |
| | 7/#7 | TA**C**9D9C | 90 |
| | 7/#8 | TA**C**9D9B | 90 |
| | 7/#10 | TA**C**9D9A | 45 |
| | 2/0* | TA**C**9D2G | 90 |
| | 4/0* | TA**C**9D2Q | 115 |
| 7/#5 | 7/#5 | TA**C**9E9E | 150 |
| | 7/#6 | TA**C**9E9D | 115 |
| | 7/#7 | TA**C**9E9C | 90 |
| | 7/#8 | TA**C**9E9B | 90 |
| | 7/#10 | TA**C**9E9A | 90 |
| | 2/0* | TA**C**9E2G | 90 |
| | 4/0* | TA**C**9E2Q | 150 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)
*Concentric stranded copper cable

| CABLE SIZE (sq mm) Run | Tap | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|---|
| 19/#9 | 19/#9 | TA**C**9F9F | 150 |
| | 7/#5 | TA**C**9F9E | 150 |
| | 7/#6 | TA**C**9F9D | 150 |
| | 7/#7 | TA**C**9F9C | 90 |
| | 7/#8 | TA**C**9F9B | 90 |
| | 2/0* | TA**C**9F2G | 90 |
| | 4/0* | TA**C**9F2Q | 150 |
| 19/#8 | 19/#8 | TA**C**9G9G | 200 |
| | 19/#9 | TA**C**9G9F | 150 |
| | 7/#5 | TA**C**9G9E | 150 |
| | 7/#6 | TA**C**9G9D | 150 |
| | 7/#7 | TA**C**9G9C | 90 |
| | 7/#8 | TA**C**9G9B | 90 |
| | 2/0* | TA**C**9G2G | 90 |
| | 4/0* | TA**C**9G2Q | 150 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)
*Concentric stranded copper cable

## *For Stranded Copper-Clad Steel Conductors*

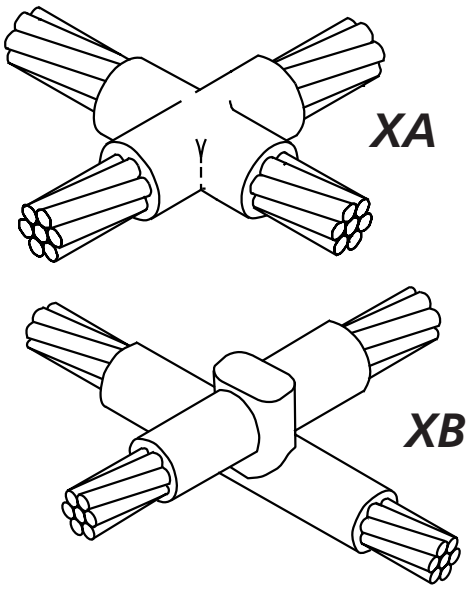
| CABLE SIZE (sq mm) Run | Tap | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|---|
| 19/#7 | 19/#7 | TA**C**9H9H | 200 |
| | 19/#8 | TA**C**9H9G | 200 |
| | 19/#9 | TA**C**9H9F | 200 |
| | 7/#5 | TA**C**9H9E | 150 |
| | 7/#6 | TA**C**9H9D | 150 |
| | 7/#7 | TA**C**9H9C | 90 |
| | 7/#8 | TA**C**9H9B | 90 |
| | 2/0* | TA**C**9H2G | 90 |
| | 4/0* | TA**C**9H2Q | 150 |
| | 500* | TA**C**9H3Q | 250 |
| 19/#6 | 19/#6 | TA**C**9J9J | 2-150 |
| | 19/#7 | TA**C**9J9H | 200 |
| | 19/#8 | TA**C**9J9G | 200 |
| | 19/#9 | TA**C**9J9F | 200 |
| | 7/#5 | TA**C**9J9E | 150 |
| | 7/#6 | TA**C**9J9D | 115 |
| | 2/0* | TA**C**9J2G | 90 |
| | 4/0* | TA**C**9J2Q | 150 |
| | 500* | TA**C**9J3Q | 2-150 |
| 2/0* | 19/#6 | TA**C**2G9J | 115 |
| | 19/#7 | TA**C**2G9H | 115 |
| | 19/#8 | TA**C**2G9G | 115 |
| | 19/#9 | TA**C**2G9F | 115 |
| | 7/#5 | TA**C**2G9E | 115 |
| | 7/#6 | TA**C**2G9D | 90 |
| | 7/#7 | TA**C**2G9C | 90 |
| | 7/#8 | TA**C**2G9B | 90 |
| | 7/#10 | TA**C**2G9A | 65 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)
*Concentric stranded copper cable

| CABLE SIZE (sq mm) Run | Tap | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|---|
| 4/0* | 19/#6 | TA**C**2Q9J | 150 |
| | 19/#7 | TA**C**2Q9H | 150 |
| | 19/#8 | TA**C**2Q9G | 150 |
| | 19/#9 | TA**C**2Q9F | 150 |
| | 7/#5 | TA**C**2Q9E | 150 |
| | 7/#6 | TA**C**2Q9D | 150 |
| | 7/#7 | TA**C**2Q9C | 90 |
| | 7/#8 | TA**C**2Q9B | 90 |
| | 7/#10 | TA**C**2Q9A | 90 |
| 250* | 19/#6 | TA**C**2V9J | 150 |
| | 19/#7 | TA**C**2V9H | 150 |
| | 19/#8 | TA**C**2V9G | 150 |
| | 19/#9 | TA**C**2V9F | 150 |
| | 7/#5 | TA**C**2V9E | 150 |
| | 7/#6 | TA**C**2V9D | 150 |
| | 7/#7 | TA**C**2V9C | 90 |
| | 7/#8 | TA**C**2V9B | 90 |
| | 7/#10 | TA**C**2V9A | 90 |
| 500* | 19/#6 | TA**D**3Q9J | 2-150 |
| | 19/#7 | TA**C**3Q9H | 250 |
| | 19/#8 | TA**C**3Q9G | 200 |
| | 19/#9 | TA**C**3Q9F | 200 |
| | 7/#5 | TA**C**3Q9E | 200 |
| | 7/#6 | TA**C**3Q9D | 150 |
| | 7/#7 | TA**C**3Q9C | 115 |
| | 7/#8 | TA**C**3Q9B | 115 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)
*Concentric stranded copper cable

## *For Stranded Copper-Clad Steel Conductors*




### HORIZONTAL X CONNECTIONS

- **XA** – Cross of horizontal cables, tap cable cut – cables in same plane.
- **XB** – Cross of horizontal cables, lapped and not cut.
- Concentric stranded copper cable unless otherwise noted.
- Solid conductor may be copper or copper-clad.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | Part No. |
|---|---|
| Handle Clamps | |
| for C Price Key Molds | L160 |
| for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | PLUSCU |
| Flint Ignitor | T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| Torch Head | T111 |

### ACCESSORIES

- See Section A

| CABLE SIZE (sq mm) run | CABLE SIZE (sq mm) tap | TYPE XA MOLD PART NO. | TYPE XA WELDING MATERIAL[1] | TYPE XB MOLD PART NO. | TYPE XB WELDING MATERIAL[1] |
|---|---|---|---|---|---|
| 7/#10 | 7/#10 | XA**C**9A9A | 65 | XB**C**9A9A | 90 |
| 7/#8 | 7/#8 | XA**C**9B9B | 90 | XB**C**9B9B | 150 |
| | 7/#10 | XA**C**9B9A | 90 | XB**C**9B9A | 115 |
| 7/#7 | 7/#7 | XA**C**9C9C | 115 | XB**Q**9C9C | 200 |
| | 7/#8 | XA**C**9C9B | 115 | XB**Q**9C9B | 200 |
| | 7/#10 | XA**C**9C9A | 115 | XB**Q**9C9A | 150 |
| 7/#6 | 7/#6 | XA**C**9D9D | 200 | XB**Q**9D9D | 250 |
| | 7/#7 | XA**C**9D9C | 150 | XB**Q**9D9C | 200 |
| | 7/#8 | XA**C**9D9B | 150 | XB**Q**9D9B | 200 |
| | 7/#10 | XA**C**9D9A | 115 | XB**Q**9D9A | 150 |
| 7/#5 | 7/#5 | XA**C**9E9E | 200 | XB**Q**9E9E | 250 |
| | 7/#6 | XA**C**9E9D | 200 | XB**Q**9E9D | 250 |
| | 7/#7 | XA**C**9E9C | 150 | XB**Q**9E9C | 200 |
| | 7/#8 | XA**C**9E9B | 150 | XB**Q**9E9B | 200 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

## *For Stranded Copper-Clad Steel Conductors*

| CABLE SIZE (sq mm) | | TYPE XA | | TYPE XB | |
|---|---|---|---|---|---|
| Run | Tap | MOLD PART NO. | WELDING MATERIAL[1] | MOLD PART NO. | WELDING MATERIAL[1] |
| 19/#9 | 19/#9 | XA**C**9F9F | 200 | XB**Q**9F9F | 2-150 |
| | 7/#5 | XA**C**9F9E | 200 | XB**Q**9F9E | 2-150 |
| | 7/#6 | XA**C**9F9D | 200 | XB**Q**9F9D | 2-150 |
| | 7/#7 | XA**C**9F9C | 150 | XB**Q**9F9C | 250 |
| | 7/#8 | XA**C**9F9B | 150 | XB**Q**9F9B | 250 |
| 19/#8 | 19/#8 | XA**C**9G9G | 250 | XB**Z**9G9G | 2-200 |
| | 19/#9 | XA**C**9G9F | 250 | XB**Z**9G9F | 2-200 |
| | 7/#5 | XA**C**9G9E | 250 | XB**Q**9G9E | 2-150 |
| | 7/#6 | XA**C**9G9D | 200 | XB**Q**9G9D | 2-150 |
| | 7/#7 | XA**C**9G9C | 150 | XB**Q**9G9C | 250 |
| | 7/#8 | XA**C**9G9B | 150 | XB**Q**9G9B | 250 |
| 19/#7 | 19/#7 | XA**D**9H9H | 2-150 | XB**Z**9H9H | 500 |
| | 19/#8 | XA**D**9H9G | 2-150 | XB**Z**9H9G | 500 |
| | 19/#9 | XA**D**9H9F | 2-150 | XB**Z**9H9F | 500 |
| | 7/#5 | XA**D**9H9E | 2-150 | XB**Z**9H9E | 2-200 |
| | 7/#6 | XA**C**9H9D | 250 | XB**Z**9H9D | 2-200 |
| | 7/#7 | XA**C**9H9C | 250 | XB**Q**9H9C | 2-150 |
| | 7/#8 | XA**C**9H9B | 250 | XB**Q**9H9B | 250 |
| 19/#6 | 19/#6 | XA**D**9J9J | 500 | XB**Z**9J9J | 3-250 |
| | 19/#7 | XA**D**9J9H | 500 | XB**Z**9J9H | 3-200 |
| | 19/#8 | XA**D**9J9G | 2-200 | XB**Z**9J9G | 3-200 |
| | 19/#9 | XA**D**9J9F | 2-150 | XB**Z**9J9F | 500 |
| | 7/#5 | XA**D**9J9E | 2-150 | XB**Z**9J9E | 500 |
| | 7/#6 | XA**D**9J9D | 2-150 | XB**Z**9J9D | 500 |
| | 7/#7 | XA**C**9J9C | 250 | XB**Z**9J9C | 2-200 |
| | 7/#8 | XA**C**9J9B | 250 | XB**Q**JF9B | 2-150 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

## *For Stranded Copper-Clad Steel Conductors*

| CABLE SIZE (sq mm) run | tap | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|---|
| 7/#10 | 7/#10 | PT**C**9A9A | 65 |
| 7/#8 | 7/#8 | PT**C**9B9B | 90 |
| | 7/#10 | PT**C**9B9A | 65 |
| 7/#7 | 7/#7 | PT**C**9C9C | 115 |
| | 7/#8 | PT**C**9C9B | 115 |
| | 7/#10 | PT**C**9C9A | 90 |
| 7/#6 | 7/#6 | PT**C**9D9D | 150 |
| | 7/#7 | PT**C**9D9C | 150 |
| | 7/#8 | PT**C**9D9B | 115 |
| | 7/#10 | PT**C**9D9A | 115 |
| 7/#5 | 7/#5 | PT**C**9E9E | 200 |
| | 7/#6 | PT**C**9E9D | 200 |
| | 7/#7 | PT**C**9E9C | 150 |
| | 7/#8 | PT**C**9E9B | 150 |
| 19/#9 | 19/#9 | PT**C**9F9F | 250 |
| | 7/#5 | PT**C**9F9E | 200 |
| | 7/#6 | PT**C**9F9D | 200 |
| | 7/#7 | PT**C**9F9C | 150 |
| | 7/#8 | PT**C**9F9B | 150 |
| 19/#8 | 19/#8 | PT**D**9G9G | 2-150 |
| | 19/#9 | PT**C**9G9F | 250 |
| | 7/#5 | PT**C**9G9E | 200 |
| | 7/#6 | PT**C**9G9D | 200 |
| | 7/#7 | PT**C**9G9C | 150 |
| | 7/#8 | PT**C**9G9B | 150 |
| 19/#7 | 19/#7 | PT**D**9H9H | 2-150 |
| | 19/#8 | PT**D**9H9G | 2-150 |
| | 19/#9 | PT**C**9H9F | 250 |
| | 7/#5 | PT**C**9H9E | 200 |
| | 7/#6 | PT**C**9H9D | 200 |
| | 7/#7 | PT**C**9H9C | 150 |
| | 7/#8 | PT**C**9H9B | 150 |
| 19/#6 | 19/#6 | PT**D**9J9J | 2-200 |
| | 19/#7 | PT**D**9J9H | 2-150 |
| | 19/#8 | PT**D**9J9G | 2-150 |
| | 19/#9 | PT**C**9J9F | 250 |
| | 7/#5 | PT**C**9J9E | 200 |
| | 7/#6 | PT**C**9J9D | 200 |
| | 7/#7 | PT**C**9J9C | 150 |
| | 7/#8 | PT**C**9J9B | 150 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

### PARALLEL HORIZONTAL CONDUCTORS

- Parallel through connection of horizontal cables.
- Run conductor is on the bottom of molds.
- Concentric strand copper cable unless otherwise noted.
- Solid conductor may be copper or copper-clad.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

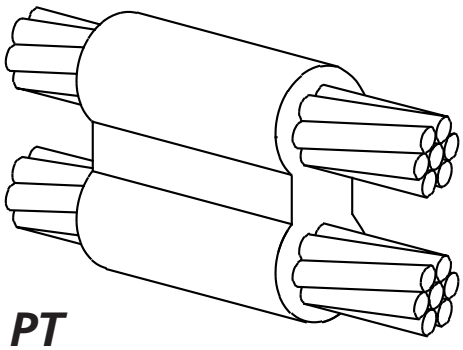
| | Part No. |
|---|---|
| Handle Clamps | |
| for C Price Key Molds | L160 |
| for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | PLUSCU |
| Flint Ignitor | T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| Torch Head | T111 |

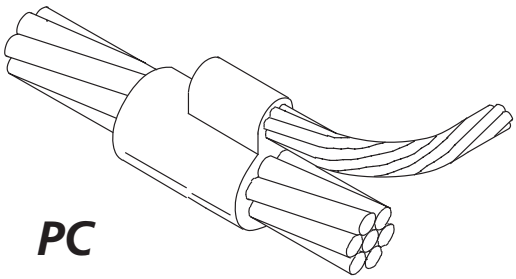
### ACCESSORIES

- See Section A



***PT***

## *For Stranded Copper-Clad Steel Conductors*



***PC***

### PARALLEL TAP CONNECTIONS

- Parallel through connection of horizontal cables.
- Solid conductor may be copper or copper-clad.
- Concentric strand copper cable unless otherwise noted.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | Part No. |
|---|---|
| Handle Clamps | |
| for C Price Key Molds | L160 |
| for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | PLUSCU |
| Flint Ignitor | T320 |

### SUGGESTED TOOLS

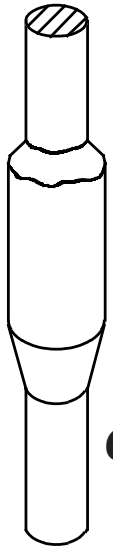
| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| Torch Head | T111 |

### ACCESSORIES

- See Section A

| CABLE SIZE (sq mm) run | tap | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|---|
| | 8 SOL | PC**C**9A1D | 32 |
| | 6 SOL | PC**C**9A1G | 32 |
| 7/#10 | 6* | PC**C**9A1H | 32 |
| | 4* | PC**C**9A1L | 45 |
| | 2* | PC**C**9A1V | 65 |
| | 8 SOL | PC**C**9B1D | 45 |
| | 6 SOL | PC**C**9B1G | 45 |
| 7/#8 | 6* | PC**C**9B1H | 45 |
| | 4* | PC**C**9B1L | 45 |
| | 2* | PC**C**9B1V | 65 |
| | 8 SOL | PC**C**9C1D | 45 |
| | 6 SOL | PC**C**9C1G | 45 |
| 7/#7 | 6* | PC**C**9C1H | 45 |
| | 4* | PC**C**9C1L | 65 |
| | 2* | PC**C**9C1V | 65 |
| | 8 SOL | PC**C**9D1D | 65 |
| | 6 SOL | PC**C**9D1G | 65 |
| 7/#6 | 6* | PC**C**9D1H | 65 |
| | 4* | PC**C**9D1L | 65 |
| | 2* | PC**D**9D1V | 90 |
| | 8 SOL | PC**C**9E1D | 65 |
| | 6 SOL | PC**C**9E1G | 65 |
| 7/#5 | 6* | PC**C**9E1H | 65 |
| | 4* | PC**C**9E1L | 90 |
| | 2* | PC**C**9E1V | 90 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)
*Concentric stranded copper cable




## GROUND ROD SPLICE

- CADWELD ground rod splices are very strong and use the proven corrosion resistant CADWELD connection.
- CADWELD ground rod splices are available for copper-clad, galvanized or stainless ground rods.
- **Bold letter** in mold part number is the price key.

## REQUIRED TOOLS

| | Part No. |
|---|---|
| Handle Clamps | |
| for C Price Key Molds | L160 |
| for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | PLUSCU |
| Flint Ignitor | T320 |
| Ground Rod Splice Clamp | B120 |

## SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| File | T329 |
| Torch Head | T111 |

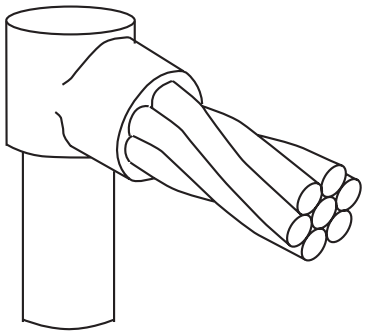
## ACCESSORIES

- See Section A

| GROUND ROD SIZE Dia. (mm) | GROUND ROD TYPE | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|---|
| 1/2″ | Steel or Copper-Clad Sectional (9/16″ Threads) | HDGB**C**14 | 250 |
| | Copper-Clad Plain (Unthreaded) | HDGB**C**15 | 250 |
| | Copper-Clad Sectional With 1/2″ Threads) | HDGB**C**13 | 250 |
| 5/8″ | Copper-Clad; 0.563″ Diameter Fits Both Plain And Sectional (Threaded) Rods | HDGB**D**16 | 2-150 |
| | 0.625″ Diameter Stainless, Stainless Clad, Galvanized, Etc. | HDGB**D**31 | 2-150 |
| 3/4″ | Copper-Clad; 0.682″ Diameter Fits Both Plain And Sectional (Threaded) Rods | HDGB**D**18 | 2-200 |
| | 0.75″ Diameter Fits Both Plain And Sectional (Threaded) Rods | HDGB**D**33 | 2-200 |
| 1″ | Copper-Clad; 0.914″ Diameter Fits Both Plain And Sectional (Threaded) Rods | HDGB**F**22 | 3-250 |
| | 1.00″ Diameter Stainless, Stainless Clad, Galvanized, Etc. | HDGB**F**37 | 3-250 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

## *For Stranded Copper-Clad Steel Conductors*



***GR***

### CABLE TO GROUND ROD

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

### REQUIRED TOOLS

| | Part No. |
|---|---|
| Handle Clamps | |
| for C Price Key Molds | L160 |
| for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | PLUSCU |
| Flint Ignitor | T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| File | T329 |
| Torch Head | T111 |

### ACCESSORIES

- See Section A

| GROUND ROD SIZE Dia. (mm) | CABLE SIZE (sq mm) | MOLD PART NUMBER | | | WELDING MATERIAL[1] |
|---|---|---|---|---|---|
| | | STEEL OR COPPER-CLAD SECTIONAL (WITH 9/16" THREADS) | COPPER-CLAD PLAIN (UNTHREADED) | COPPER-CLAD SECTIONAL (WITH 1/2" THREADS) | |
| 1/2" | 7/#10 | GR**C**149A | GR**C**159A | GR**C**139A | 65 |
| | 7/#8 | GR**C**149B | GR**C**159B | GR**C**139B | 90 |
| | 7/#7 | GR**C**149C | GR**C**159C | GR**C**139C | 90 |
| | 7/#6 | GR**C**149D | GR**C**159D | GR**C**139D | 90 |
| | 7/#5 | GR**C**149E | GR**C**159E | GR**C**139E | 90 |
| | 19/#9 | GR**C**149F | GR**C**159F | GR**C**139F | 90 |
| | 19/#8 | GR**C**149G | GR**C**159G | GR**C**139G | 90 |

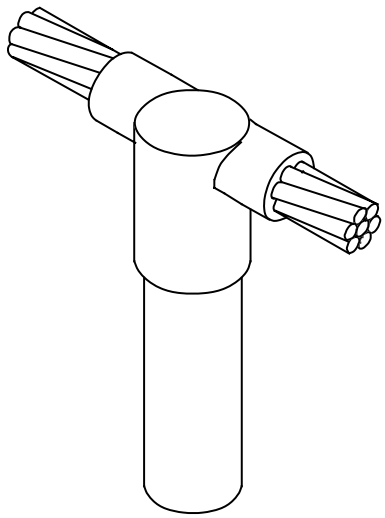
[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

## *For Stranded Copper-Clad Steel Conductors*

| GROUND ROD SIZE Dia. (mm) | CABLE SIZE (sq mm) | MOLD PART NUMBER | | WELDING MATERIAL[1] |
|---|---|---|---|---|
| | | COPPER-CLAD SECTIONAL (THREADED) OR PLAIN | STEEL | |
| 5/8″ | 7/#10 | GR**C**169A | GR**C**319A | 65 |
| | 7/#8 | GR**C**169B | GR**C**319B | 90 |
| | 7/#7 | GR**C**169C | GR**C**319C | 90 |
| | 7/#6 | GR**C**169D | GR**C**319D | 90 |
| | 7/#5 | GR**C**169E | GR**C**319E | 90 |
| | 19/#9 | GR**C**169F | GR**C**319F | 90 |
| | 19/#8 | GR**C**169G | GR**C**319G | 115 |
| | 19/#7 | GR**C**169H | GR**C**319H | 150 |
| | 19/#6 | GR**C**169J | GR**C**319J | 150 |
| 3/4″ | 7/#10 | GR**C**189A | GR**C**339A | 90 |
| | 7/#8 | GR**C**189B | GR**C**339B | 90 |
| | 7/#7 | GR**C**189C | GR**C**339C | 90 |
| | 7/#6 | GR**C**189D | GR**C**339D | 90 |
| | 7/#5 | GR**C**189E | GR**C**339E | 90 |
| | 19/#9 | GR**C**189F | GR**C**339F | 90 |
| | 19/#8 | GR**C**189G | GR**C**339G | 115 |
| | 19/#7 | GR**C**189H | GR**C**339H | 150 |
| | 19/#6 | GR**C**189J | GR**C**339J | 150 |
| 1″ | 7/#10 | GR**C**229A | GR**C**379A | 150 |
| | 7/#8 | GR**C**229B | GR**C**379B | 150 |
| | 7/#7 | GR**C**229C | GR**C**379C | 150 |
| | 7/#6 | GR**C**229D | GR**C**379D | 150 |
| | 7/#5 | GR**C**229E | GR**C**379E | 150 |
| | 19/#9 | GR**C**229F | GR**C**379F | 150 |
| | 19/#8 | GR**C**229G | GR**C**379G | 200 |
| | 19/#7 | GR**C**229H | GR**C**379H | 200 |
| | 19/#6 | GR**C**229J | GR**C**379J | 200 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

## *For Stranded Copper-Clad Steel Conductors*



***GT***

### CABLE TO GROUND ROD

- Through cable to top of ground rod. Connections are for concentric strand copper cable unless otherwise noted.
- For copper-clad, galvanized, stainless clad or stainless steel ground rods.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | Part No. |
|---|---|
| Handle Clamps | |
| for C Price Key Molds | L160 |
| for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | PLUSCU |
| Flint Ignitor | T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| File | T329 |
| Torch Head | T111 |

### ACCESSORIES

- See Section A

| GROUND ROD SIZE Dia. (mm) | CABLE SIZE (sq mm) | MOLD PART NUMBER | | | WELDING MATERIAL[1] |
|---|---|---|---|---|---|
| | | STEEL OR COPPER-CLAD SECTIONAL (WITH 9/16" THREADS) | COPPER-CLAD PLAIN (UNTHREADED) | COPPER-CLAD SECTIONAL (WITH 1/2" THREADS) | |
| 1/2" | 7/#10 | GT**C**149A | GT**C**159A | GT**C**139A | 90 |
| | 7/#8 | GT**C**149B | GT**C**159B | GT**C**139B | 90 |
| | 7/#7 | GT**C**149C | GT**C**159C | GT**C**139C | 90 |
| | 7/#6 | GT**C**149D | GT**C**159D | GT**C**139D | 115 |
| | 7/#5 | GT**C**149E | GT**C**159E | GT**C**139E | 150 |
| | 19/#9 | GT**C**149F | GT**C**159F | GT**C**139F | 150 |
| | 19/#8 | GT**C**149G | GT**C**159G | GT**C**139G | 200 |

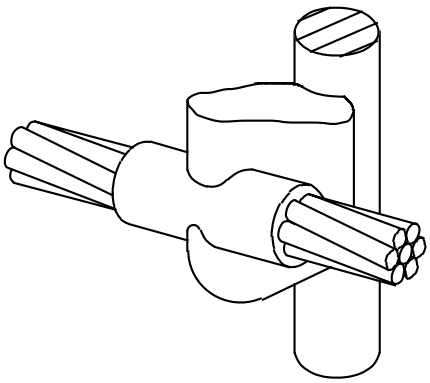
[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

## *For Stranded Copper-Clad Steel Conductors*

| GROUND ROD SIZE Dia. (mm) | CABLE SIZE (sq mm) | MOLD PART NUMBER COPPER-CLAD SECTIONAL (THREADED) OR PLAIN | MOLD PART NUMBER STEEL | WELDING MATERIAL[1] |
|---|---|---|---|---|
| 5/8″ | 7/#10 | GT**C**169A | GT**C**319A | 90 |
| | 7/#8 | GT**C**169B | GT**C**319B | 115 |
| | 7/#7 | GT**C**169C | GT**C**319C | 115 |
| | 7/#6 | GT**C**169D | GT**C**319D | 115 |
| | 7/#5 | GT**C**169E | GT**C**319E | 150 |
| | 19/#9 | GT**C**169F | GT**C**319F | 150 |
| | 19/#8 | GT**C**169G | GT**C**319G | 200 |
| | 19/#7 | GT**C**169H | GT**C**319H | 250 |
| | 19/#6 | GT**C**169J | GT**C**319J | 250 |
| 3/4″ | 7/#10 | GT**C**189A | GT**C**339A | 90 |
| | 7/#8 | GT**C**189B | GT**C**339B | 115 |
| | 7/#7 | GT**C**189C | GT**C**339C | 115 |
| | 7/#6 | GT**C**189D | GT**C**339D | 115 |
| | 7/#5 | GT**C**189E | GT**C**339E | 150 |
| | 19/#9 | GT**C**189F | GT**C**339F | 150 |
| | 19/#8 | GT**C**189G | GT**C**339G | 200 |
| | 19/#7 | GT**C**189H | GT**C**339H | 250 |
| | 19/#6 | GT**C**189J | GT**C**339J | 250 |
| 1″ | 7/#10 | GT**C**229A | GT**C**379A | 150 |
| | 7/#8 | GT**C**229B | GT**C**379B | 150 |
| | 7/#7 | GT**C**229C | GT**C**379C | 150 |
| | 7/#6 | GT**C**229D | GT**C**379D | 150 |
| | 7/#5 | GT**C**229E | GT**C**379E | 200 |
| | 19/#9 | GT**C**229F | GT**C**379F | 200 |
| | 19/#8 | GT**C**229G | GT**C**379G | 200 |
| | 19/#7 | GT**C**229H | GT**C**379H | 250 |
| | 19/#6 | GT**C**229J | GT**C**379J | 250 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

## *For Stranded Copper-Clad Steel Conductors*



*GY*

### CABLE TO GROUND ROD

- Through cable to side of ground rod.
- Concentric strand copper cable unless otherwise noted.
- Ground rods can be copper-clad, galvanized, stainless clad or stainless steel.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | Part No. |
|---|---|
| Handle Clamps | |
| for C Price Key Molds | L160 |
| for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | PLUSCU |
| Flint Ignitor | T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| File | T329 |
| Torch Head | T111 |

### ACCESSORIES

- See Section A

| GROUND ROD SIZE Dia. (mm) | CABLE SIZE (sq mm) | MOLD PART NUMBER | | | WELDING MATERIAL[1] |
|---|---|---|---|---|---|
| | | STEEL OR COPPER-CLAD SECTIONAL (WITH 9/16" THREADS) | COPPER-CLAD PLAIN (UNTHREADED) | COPPER-CLAD SECTIONAL (WITH 1/2" THREADS) | |
| 1/2" | 7/#10 | GY**R**149A | GY**R**159A | GY**R**139A | 90 |
| | 7/#8 | GY**R**149B | GY**R**159B | GY**R**139B | 115 |
| | 7/#7 | GY**R**149C | GY**R**159C | GY**R**139C | 115 |
| | 7/#6 | GY**R**149D | GY**R**159D | GY**R**139D | 150 |
| | 7/#5 | GY**R**149E | GY**R**159E | GY**R**139E | 150 |
| | 19/#9 | GY**R**149F | GY**R**159F | GY**R**139F | 150 |
| | 19/#8 | GY**R**149G | GY**R**159G | GY**R**139G | 200 |

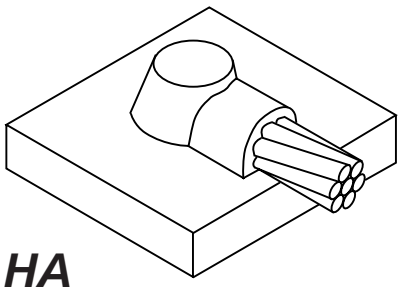
[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

## *For Stranded Copper-Clad Steel Conductors*

| GROUND ROD SIZE Dia. (mm) | CABLE SIZE (sq mm) | MOLD PART NUMBER COPPER-CLAD SECTIONAL (THREADED) OR PLAIN | MOLD PART NUMBER STEEL | WELDING MATERIAL[1] |
|---|---|---|---|---|
| 5/8″ | 7/#10 | GY**R**169A | GY**R**319A | 90 |
| | 7/#8 | GY**R**169B | GY**R**319B | 115 |
| | 7/#7 | GY**R**169C | GY**R**319C | 115 |
| | 7/#6 | GY**R**169D | GY**R**319D | 150 |
| | 7/#5 | GY**R**169E | GY**R**319E | 150 |
| | 19/#9 | GY**R**169F | GY**R**319F | 150 |
| | 19/#8 | GY**R**169G | GY**R**319G | 200 |
| | 19/#7 | GY**F**169H | GY**F**319H | 2-150 |
| | 19/#6 | GY**F**169J | GY**F**319J | 2-200 |
| 3/4″ | 7/#10 | GY**R**189A | GY**R**339A | 90 |
| | 7/#8 | GY**R**189B | GY**R**339B | 115 |
| | 7/#7 | GY**R**189C | GY**R**339C | 115 |
| | 7/#6 | GY**R**189D | GY**R**339D | 150 |
| | 7/#5 | GY**R**189E | GY**R**339E | 200 |
| | 19/#9 | GY**R**189F | GY**R**339F | 200 |
| | 19/#8 | GY**R**189G | GY**R**339G | 250 |
| | 19/#7 | GY**F**189H | GY**F**339H | 2-200 |
| | 19/#6 | GY**F**189J | GY**F**339J | 500 |
| 1″ | 7/#10 | GY**R**229A | GY**R**379A | 90 |
| | 7/#8 | GY**R**229B | GY**R**379B | 115 |
| | 7/#7 | GY**R**229C | GY**R**379C | 115 |
| | 7/#6 | GY**R**229D | GY**R**379D | 150 |
| | 7/#5 | GY**R**229E | GY**R**379E | 200 |
| | 19/#9 | GY**R**229F | GY**R**379F | 200 |
| | 19/#8 | GY**R**229G | GY**R**379G | 250 |
| | 19/#7 | GY**F**229H | GY**F**379H | 2-200 |
| | 19/#6 | GY**F**229J | GY**F**379J | 500 |

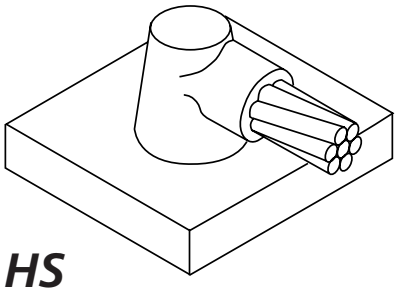
[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

## *For Stranded Copper-Clad Steel Conductors*



***HA***

Cable on surface



***HS***

Cable off surface

### HORIZONTAL STEEL SURFACE

- Horizontal concentric copper conductor to flat steel surface or top of horizontal pipe
- **A test weld should be made to check the possibility of burn-through on thin sections or thin wall pipe.**
- Concentric stranded copper cable listed.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | | Part No.. |
|---|---|---|
| Handle Clamps* | | |
| Flat Surface | for C Price Key Molds | L160 |
| | for D Price Key Molds | L159 |
| Pipe (curved surface) | for C Price Key Molds | B160V |
| | for D Price Key Molds | B159V |
| CADWELD PLUS Control Unit or Flint Ignitor | | PLUSCU T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| Torch Head | T111 |
| Rasp | T321 |

### ACCESSORIES

- See Section A

*Handles are included with A Price Key Molds.

### TYPE HA

| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#10 | HA**A**9A | 65 |

### TYPE HS

| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#8 | HS**C**9B | 90 |
| 7/#7 | HS**C**9C | 90 |
| 7/#6 | HS**C**9D | 115 |
| 7/#5 | HS**C**9E | 115 |
| 19/#9 | HS**C**9F | 115 |
| 19/#8 | HS**C**9G | 150 |
| 19/#7 | HS**C**9H | 200 |
| 19/#6 | HS**C**9J | 200 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

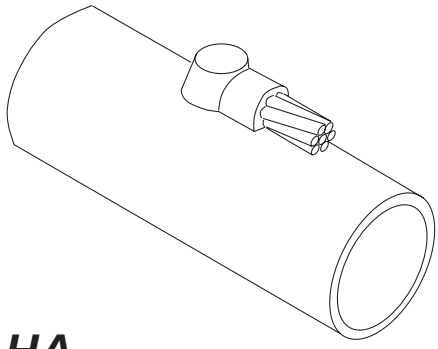
**Cable to Steel Pipe** (Types **HA** and **HS**) –
Use flat surface mold part number with suffix.

| Cable | Nominal Pipe Diameter | Suffix |
|---|---|---|
| 7/#10 | 12" and smaller | Nominal Pipe Size |
| | 14" and larger | None |
| 7/#8 thru 19/#9 | 28" and smaller | Nominal Pipe Size |
| | 30" and larger | None |

Example: 7/#10 cable to 3-1/2" pipe, HA**A**9A3.50

For welds to copper surface, contact Pentair or your local distributor or agent.

## *For Stranded Copper-Clad Steel Conductors*



***HA***

Cable to Horizontal Steel Pipe

### RANGE OF HORIZONTAL STEEL PIPES

- Horizontal conductor to top of horizontal steel pipe.
- **A test weld should be made to check the possibility of burn-through on thin sections or thin wall pipe.**
- When only one pipe size is involved, see Cable to Steel Pipe table on previous page.
- Concentric stranded copper cable listed.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | | Part No. |
|---|---|---|
| Handle Clamps* | | |
| Flat Surface | for C Price Key Molds | L160 |
| | for D Price Key Molds | L159 |
| Pipe (curved surface) | for C Price Key Molds | B160V |
| | for D Price Key Molds | B159V |
| CADWELD PLUS Control Unit or Flint Ignitor | | PLUSCU T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Mold Cleaning Brush | T394 |
| Rasp | T321 |
| Torch Head | T111 |

### ACCESSORIES

- See Section A

*Handles are included with A Price Key Molds.

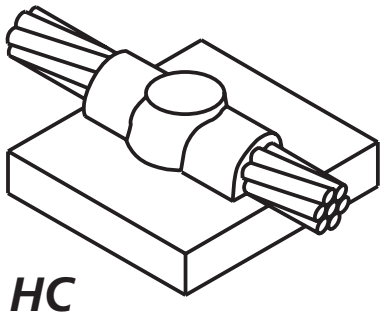
| CABLE SIZE | NOMINAL PIPE SIZE | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|---|
| 7/#10 | 1-1/4" to 2" Pipe | HA**A**9A162C | 65 |
| | 3" to 4" Pipe | HA**A**9A350C | 65 |
| | 6" to 8" Pipe | HA**A**9A7C | 65 |
| | 10" to 12" Pipe | HA**A**9A11C | 65 |
| | 14" Pipe or Larger | (2) | |
| 7/#8 | 3" to 4" Pipe | HA**H**9B350C | 90 |
| | 6" to 10" Pipe | HA**H**9B8C | 90 |
| | 12" to 28" Pipe | HA**H**9B20C | 90 |
| | 30" Pipe or Larger | (2) | |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)
(2) Use flat surface mold part number. See previous page.

| CABLE SIZE | NOMINAL PIPE SIZE | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|---|
| 7/#7 | 3" to 4" Pipe | HA**H**9C350C | 90 |
| | 6" to 10" Pipe | HA**H**9C8C | 90 |
| | 12" to 28" Pipe | HA**H**9C20C | 90 |
| | 30" Pipe or Larger | (2) | |
| 7/#6 | 3" to 4" Pipe | HA**H**9D350C | 115 |
| | 6" to 10" Pipe | HA**H**9D8C | 115 |
| | 12" to 28" Pipe | HA**H**9D20C | 115 |
| | 30" Pipe or Larger | (2) | |
| 7/#5 | 3" to 4" Pipe | HA**H**9E350C | 115 |
| | 6" to 8" Pipe | HA**H**9E8C | 115 |
| | 12" to 28" Pipe | HA**H**9E20C | 115 |
| | 30" Pipe or Larger | (2) | |

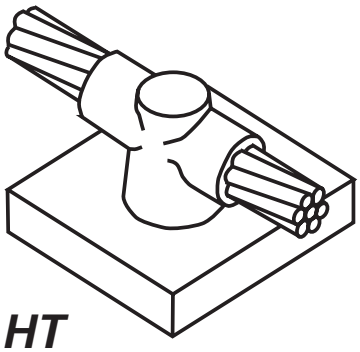
(2) Use flat surface mold part number. See previous page.

## *For Stranded Copper-Clad Steel Conductors*



***HC***

Cable on surface



***HT***

Cable off surface

### RANGE OF HORIZONTAL STEEL PIPES

- Cable to horizontal flat steel surface or cable to top of horizontal steel pipe.
- **A test weld should be made to check the possibility of burn-through on thin sections or thin wall pipe.**
- Concentric stranded copper cable listed.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | | Part No.. |
|---|---|---|
| Handle Clamps* | | |
| Flat Surface | for C Price Key Molds | L160 |
| | for D Price Key Molds | L159 |
| Pipe (curved surface) | for C Price Key Molds | B160V |
| | for D Price Key Molds | B159V |
| CADWELD PLUS Control Unit or Flint Ignitor | | PLUSCU T320 |

### SUGGESTED TOOLS

| | | |
|---|---|---|
| Cable Cleaning Brush | | T313 or T314 |
| Slag Removal Spade | | |
| | #65 w/m & smaller | B136A |
| | #90 w/m & larger | B136B |
| Mold Cleaning Brush | | T394 |
| Rasp | | T321 |
| Torch Head | | T111 |

### ACCESSORIES

- See Section A

## TYPE HC

| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#10 | HC**A**9A | 65 |

## TYPE HT

| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#8 | HT**C**9B | 90 |
| 7/#7 | HT**C**9C | 115 |
| 7/#6 | HT**C**9D | 150 |
| 7/#5 | HT**C**9E | 150 |
| 19/#9 | HT**C**9F | 150 |
| 19/#8 | HT**C**9G | 200 |
| 19/#7 | HT**C**9H | 250 |
| 19#6 | HT**C**9J | 2-150 |

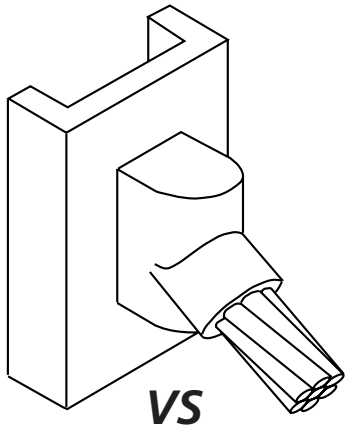
[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

### Cable to horizontal Steel Pipe (Types **HC** and **HT**) – Use flat surface mold part number with suffix.

| Cable | Nominal Pipe Diameter | Suffix |
|---|---|---|
| 7/#10 | 12" and smaller<br>14" and larger | Nominal Pipe Size<br>None |
| 7/#8 thru 19/#6 | 28" and smaller<br>30" and larger | Nominal Pipe Size<br>None |

Example: 7/#10 cable to 6" pipe, HC**A**9A6

## *For Stranded Copper-Clad Steel Conductors*




### VERTICAL STEEL SURFACE

- Cable down at 45° to vertical steel surface including pipe.
- Cable to vertical flat steel surface; cable to side of vertical or horizontal steel pipe.
- Concentric stranded copper cable listed.
- **A test weld should be made to check the possibility of burn through on thin sections or thin wall pipe.**
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | | Part No. |
|---|---|---|
| Handle Clamps | | |
| Flat Surface | for C Price Key Molds | L160 |
| | for D Price Key Molds | L159 |
| Pipe | for C Price Key Molds | B160V |
| | for D Price Key Molds | B159V |
| | (Pipes 10ø-250 mm dia. add B158) | |
| CADWELD PLUS Control Unit or Flint Ignitor | | PLUSCU T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Mold Cleaning Tool | T394 |
| Mold Cleaning Brush | B265 |
| Rasp | T321 |
| Torch Head | T111 |

### ACCESSORIES

- See Section A

| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#10 | VS**C**9A | 65 |
| 7/#8 | VS**C**9B | 90 |
| 7/#7 | VS**C**9C | 90 |
| 7/#6 | VS**C**9D | 115 |
| 7/#5 | VS**C**9E | 115 |
| 19/#9 | VS**C**9F | 115 |
| 19/#8 | VS**C**9G | 150 |
| 19/#7 | VS**C**9H | 200 |
| 19/#6 | VS**C**9J | 200 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

### Cable to Vertical Steel Pipe –

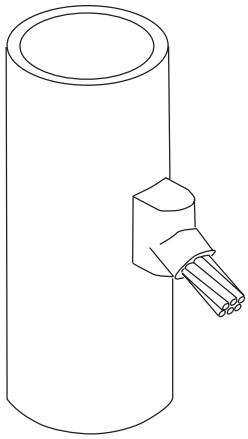
Use flat surface mold part number; add **V** and suffix.

| Cable | Nominal Pipe Diameter | Suffix |
|---|---|---|
| 7/#10 thru 19/#9 | 30" and smaller | Nominal Pipe Size |
| | 32" and larger | None |

Example: 7/#7 to 4" pipe, VS**C**9CV4

Cable to horizontal steel pipe-
Add **H** and nominal pipe size to flat surface mold number
Example: 7/#8 to 8" pipe, VS**C**9BH8

## *For Stranded Copper-Clad Steel Conductors*



***VS***

### RANGE OF VERTICAL PIPES

- Cable down at 45° to vertical steel surface including pipe.
- **A test weld should be made to check the possibility of burn through on thin sections or thin wall pipe.**
- When only one pipe size rather than a range sizes is involved, see Cable to Steel Pipe Table on previous page.
- Concentric stranded copper cable listed.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | Part No. |
|---|---|
| Handle Clamps | |
| for C Price Key Molds | L160 |
| for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | PLUSCU |
| Flint Ignitor | T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Rasp | T321 |
| Torch Head | T111 |
| Mold Cleaning Brush | T394 |

### ACCESSORIES

- See Section A

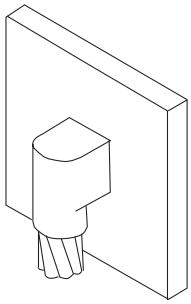
| CABLE SIZE | NOMINAL PIPE SIZE | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|---|
| 7/#10 | 1-1/2" to 4" Pipe | VS**C**9AV3C | 45 |
| | 4" to 6" Pipe | VS**C**9AV5C | 45 |
| | 6" to 10" Pipe | VS**C**9AV8C | 45 |
| | 12" to 30" Pipe | VS**C**9AV21C | 45 |
| | 32" Pipe or Larger | (2) | |
| 7/#8 | 2" to 4" Pipe | VS**C**9BV3C | 90 |
| | 4" to 6" Pipe | VS**C**9BV5C | 90 |
| | 6" to 10" Pipe | VS**C**9BV8C | 90 |
| | 12" to 30" Pipe | VS**C**9BV21C | 90 |
| | 32" Pipe or Larger | (2) | |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)
(2) Use flat surface mold part number. See previous page.

| CABLE SIZE | NOMINAL PIPE SIZE | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|---|
| 7/#7 | 2" to 4" Pipe | VS**C**9C3C | 90 |
| | 4" to 6" Pipe | VS**C**9CV5C | 90 |
| | 6" to 10" Pipe | VS**C**9CV8C | 90 |
| | 12" to 30" Pipe | VS**C**9CV21C | 90 |
| | 32" Pipe or Larger | (2) | |
| 7/#6 | 2" to 4" Pipe | VS**C**9DV3C | 115 |
| | 4" to 6" Pipe | VS**C**9DV5C | 115 |
| | 6" to 10" Pipe | VS**C**9DV8C | 115 |
| | 12" to 30" Pipe | VS**C**9DV21C | 115 |
| | 32" Pipe or Larger | (2) | |
| 7/#5 | 2" to 4" Pipe | VS**C**9EV3C | 115 |
| | 4" to 6" Pipe | VS**C**9EV5C | 115 |
| | 6" to 10" Pipe | VS**C**9EV8C | 115 |
| | 12" to 30" Pipe | VS**C**9EV21C | 115 |
| | 32" Pipe or Larger | (2) | |

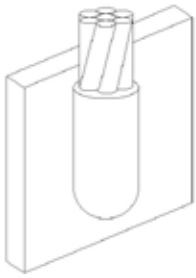
(2) Use flat surface mold part number. See previous page.

## *For Stranded Copper-Clad Steel Conductors*



***VB***

Cable down to vertical steel surface



***VF***

Cable up to vertical steel surface

### VERTICAL STEEL SURFACE

- Connection of vertical cable to vertical flat steel surface or to side of vertical or horizontal steel pipe.
- **A test weld should be made to check the possibility of burn through on thin sections or thin wall pipe.**
- Cable to steel pipe. Add pipe orientation and nominal pipe size to flat surface mold part number. Examples: VF**C**9CV6, 7/#7 conductor to vertical 6" pipe VF**C**9AH4, 7/#10 condctor to horizontal 4" pipe.
- Concentric stranded copper cable listed.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | | Part No. |
|---|---|---|
| Handle Clamps | for C Price Key Molds | L160 |
| | for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or Flint Ignitor | | PLUSCU T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | B136A or B136B |
| Mold Cleaning Brush | T394 |
| Rasp | T321 |
| Torch Head | T111 |

### ACCESSORIES

- See Section A

### *TYPE VB*

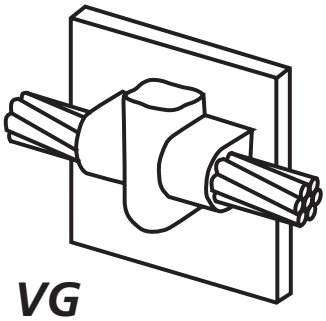
| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#10 | VB**C**9A | 65 |
| 7/#8 | VB**C**9B | 115 |
| 7/#7 | VB**C**9C | 115 |
| 7/#6 | VB**C**9D | 150 |
| 7/#5 | VB**C**9E | 150 |
| 19/#9 | VB**C**9F | 200 |
| 19/#8 | VB**C**9G | 200 |
| 19/#7 | VB**C**9H | 250 |
| 19/#6 | VB**R**9J | 2-150 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

### *TYPE VF*

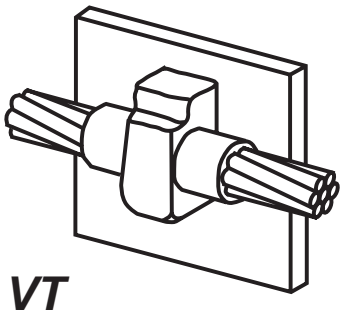
| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#10 | VF**C**9A | 90 |
| 7/#8 | VF**C**9B | 150 |
| 7/#7 | VF**C**9C | 150 |
| 7/#6 | VF**R**9D | 200 |
| 7/#5 | VF**R**9E | 200 |
| 19/#9 | VF**R**9F | 200 |
| 19/#8 | VF**R**9G | 250 |
| 19/#7 | VF**F**9H | 2-150 |
| 19/#6 | VF**F**9J | 2-200 |

## *For Stranded Copper-Clad Steel Conductors*



***VG***

Cable on surface



***VT***

Cable off surface

### VERTICAL STEEL SURFACE

- CADWELD through connections to vertical flat steel surface; cable to vertical side of horizontal pipe (Type VG only); cable to vertical steel pipe (Type VT only).
- **A test weld should be made to check the possibility of burn through on thin sections or thin wall pipe.**
- Cable to steel pipe. Add nominal pipe size to flat surface mold part number. Examples: Horizontal Pipe, Use Type VG, add nominal pipe size suffix, for 7/#7 to 6 in. pipe, VG**C**9C6 for Vertical Pipe, Use Type VT, add nominal pipe size suffix, Example for 7/#8 to 4 in. pipe, VT**C**9B4.
- Concentric stranded copper cable listed.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | | Part No. |
|---|---|---|
| Handle Clamps | for C Price Key Molds | L160 |
| | for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or Flint Ignitor | | PLUSCU T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | B136A or B136B |
| Mold Cleaning Brush | T394 |
| Rasp | T321 |
| Torch Head | T111 |

### ACCESSORIES

- See Section A

### *TYPE VG*

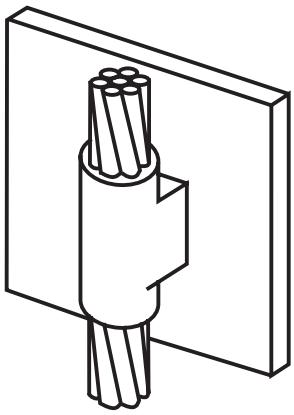
| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#10 | VG**C**9A | 65 |
| 7/#8 | VG**C**9B | 115 |
| 7/#7 | VG**C**9C | 115 |
| 19/#6 | VG**C**9D | 150 |
| 19/#5 | VG**C**9E | 150 |
| 19/#9 | VG**C**9F | 150 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

### *TYPE VT*

| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#10 | VT**C**9A | 90 |
| 7/#8 | VT**C**9B | 115 |
| 7/#7 | VT**C**9C | 115 |
| 19/#6 | VT**C**9D | 150 |
| 19/#5 | VT**C**9E | 150 |
| 19/#9 | VT**C**9F | 150 |

## *For Stranded Copper-Clad Steel Conductors*



***VV***

### VERTICAL STEEL SURFACE

- Through connections to vertical flat surface or to side of vertical or horizontal steel pipe.
- **A test weld should be made to check the possibility of burn through on thin sections or thin wall pipe.**
- Cable to steel pipe. Add pipe orientation and nominal pipe size to flat surface mold part number. Examples: VV**R**9CV6, 7/#7 conductor to vertical 6" pipe VV**R**9AH46, 7/#10 to horizontal 6" pipe.
- Concentric stranded copper cable listed.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | | Part No. |
|---|---|---|
| Handle Clamps | | |
| | for C Price Key Molds | L160 |
| | for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | | PLUSCU |
| Flint Ignitor | | T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | B136A or B136B |
| Mold Cleaning Brush | T394 |
| Rasp | T321 |
| Torch Head | T111 |

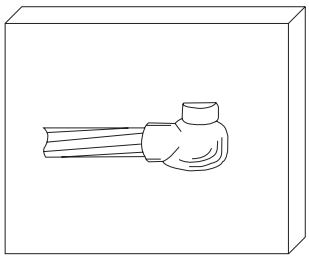
### ACCESSORIES

- See Section A

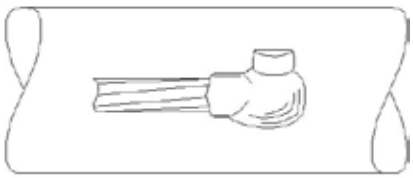
| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#10 | VV**C**9A | 115 |
| 7/#8 | VV**R**9B | 200 |
| 7/#7 | VV**R**9C | 200 |
| 7/#6 | VV**R**9D | 250 |
| 7/#5 | VV**R**9E | 250 |
| 19/#9 | VV**R**9F | 250 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

## *For Stranded Copper-Clad Steel Conductors*



***VN*** Cable on Flat Surface
Right hand shown - RH



***VN*** Cable on Pipe
Right hand shown - RH

### VERTICAL STEEL SURFACE

- Conductor to vertical flat steel surface or cable to the side of horizontal steel pipe.
- **A test weld should be made to check the possibility of burn through on thin sections or thin wall pipe.**
- Cable to steel pipe. Add pipe orientation and nominal pipe size to flat surface mold part number. Example: VN**C**9CLH4 - weld on left end of conductor, #4 pipe, 7/#7 stranded conductor.
- Concentric stranded copper cable listed.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | | Part No. |
|---|---|---|
| Handle Clamps | | |
| | for C Price Key Molds | L160 |
| | for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | | PLUSCU |
| Flint Ignitor | | T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | B136A or B136B |
| Mold Cleaning Brush | T394 |
| Rasp | T321 |
| Torch Head | T111 |

### ACCESSORIES

- See Section A

**Cable to Horizontal Steel Pipe (Type VN)** –
Use flat surface mold part number with suffix.

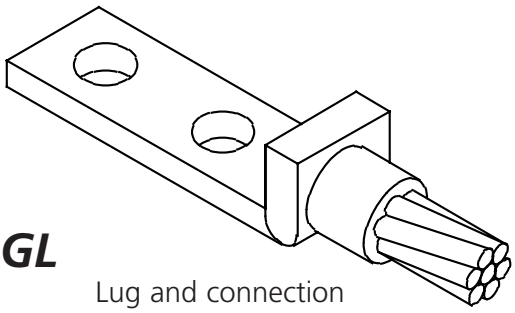
| Cable | Nominal Pipe Size | Suffix |
|---|---|---|
| #1 and smaller | 12″ and smaller | Nominal Pipe Size |
| | 14″ and larger | None |
| 1/0 thru 250 | 28″ and smaller | Nominal Pipe Size |
| | 30″ and larger | None |

Example: 2/0 cable to 4″ pipe, VNC-2G-LH-4

| CABLE SIZE (sq mm) | MOLD PART NO. | WELDING MATERIAL[1] |
|---|---|---|
| 7/#10 | VN**C**9A | 65 |
| 7/#8 | VN**C**9B | 90 |
| 7/#7 | VN**C**9C | 90 |
| 7/#6 | VN**C**9D | 115 |
| 7/#5 | VN**C**9E | 115 |
| 19/#9 | VN**C**9F | 115 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

# *For Stranded Copper-Clad Steel Conductors*



***GL***

Lug and connection

## COPPER LUGS

- Lugs and connections for equipment and structures. Ideal for power applications.
- Concentric stranded copper cable is listed.
- **Bold letter** in mold part number is the price key.

## REQUIRED TOOLS

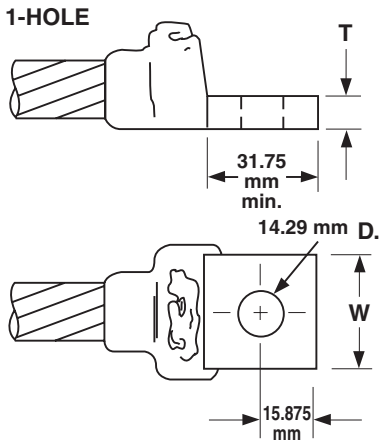
| | Part No. |
|---|---|
| Handle Clamps | |
| for C Price Key Molds | L160 |
| for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | PLUSCU |
| Flint Ignitor | T320 |

## SUGGESTED TOOLS

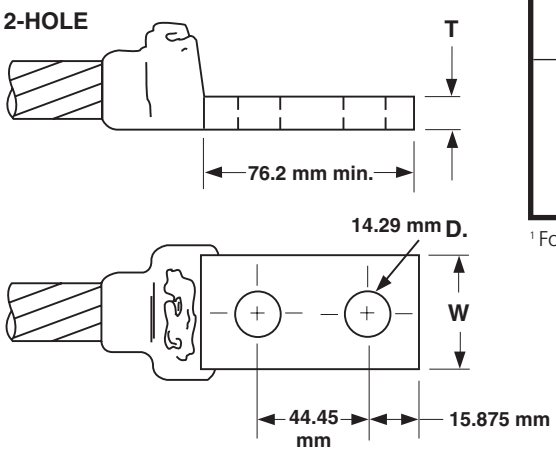
| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| Torch Head | T111 |

## ACCESSORIES

- See Section A




**NEMA Drilled Lugs-B121 Series**



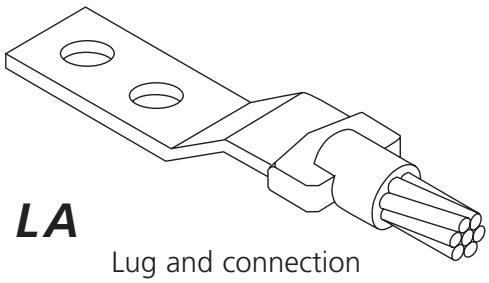

**NEMA Drilled Lugs-B122 Series**

| CABLE SIZE | MOLD NUMBER | WELDING MATERIAL[1] | LUG SIZE T X W | GL LUG NUMBER 1 HOLE | GL LUG NUMBER 2 HOLES |
|---|---|---|---|---|---|
| 7/#10 | GL**C**CE9A | 32 | 1/8 x 1 | B121CE | B122-CE |
| 7/#8 | GL**C**CE9B | 45 | 1/8 x 1 | B121CE | B122-CE |
| 7/#7 | GL**C**CE9C | 45 | 1/8 x 1 | B121CE | B122-CE |
| 7/#6 | GL**C**CE9D | 65 | 1/8 x 1 | B121CE | B122-CE |
| 7/#5 | GL**C**DE9E | 65 | 3/16 x 1 | B121DE | B122-DE |
| 19/#9 | GL**C**DE9F | 65 | 3/16 x 1 | B121DE | B122DE |
| 19/#8 | GL**C**DE9G | 90 | 3/16 x 1 | B121DE | B122DE |
| 19/#7 | GL**C**DE9H | 90 | 3/16 x 1 | B121DE | B122DE |
| 19/#6 | GL**C**EE9J | 115 | 1/4 x 1 | B121EE | B122EE |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

**All lugs are tin plated copper.**

## *For Stranded Copper-Clad Steel Conductors*



***LA***

Lug and connection

### COPPER LUGS (METRIC)

- Cable to lug and connections. Can be either field fabricated from copper busbar or factory-made lugs. Ideal for power applications. Connection must be made with cable and lug horizontal.
- Concentric stranded copper cable is listed.
- **Bold letter** in mold part number is the price key.

### REQUIRED TOOLS

| | Part No. |
|---|---|
| Handle Clamps | |
| for C Price Key Molds | L160 |
| for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | PLUSCU |
| Flint Ignitor | T320 |

### SUGGESTED TOOLS

| | |
|---|---|
| Cable Cleaning Brush | T313 or T314 |
| Slag Removal Spade | |
| #65 w/m & smaller | B136A |
| #90 w/m & larger | B136B |
| Mold Cleaning Brush | T394 |
| Cable Clamp | B265 |
| Torch Head | T111 |

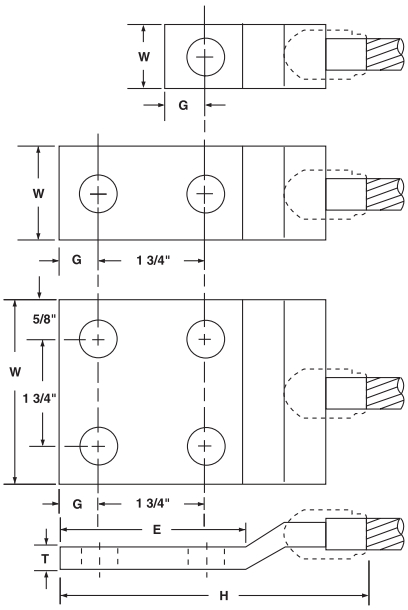
### ACCESSORIES

- See Section A

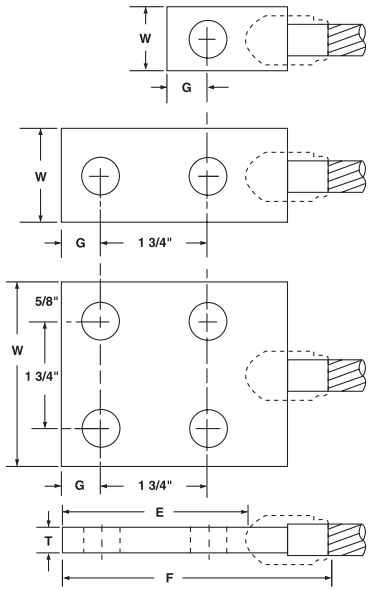
| CABLE SIZE (sq mm) | BUS OR LUG SIZE (mm) | MOLD PART NUMBER | WELDING MATERIAL[1] |
|---|---|---|---|
| 7/#10 | 3/16 x 1 | LA**C**9ADE | 65 |
| 7/#8 | 3/16 x 1 | LA**C**9BDE | 65 |
| | 1/4 x 1 | LA**C**9BEE | 65 |
| 7/#7 | 3/16 x 1 | LA**C**9CDE | 90 |
| | 1/4 x 1 | LA**C**9CEE | 90 |
| 7/#6 | 3/16 x 1 | LA**C**9DDE | 90 |
| | 1/4 x 1 | LA**C**9DEE | 90 |
| | 1/4 x 1-1/2 | LA**C**9DEG | 90 |
| 7/#5 | 3/16 x 1 | LA**C**9EDE | 90 |
| | 1/4 x 1 | LA**C**9EEE | 90 |
| | 1/4 x 1-1/2 | LA**C**9EEG | 90 |
| 19/#9 | 3/16 x 1 | LA**C**9FDE | 90 |
| | 1/4 x 1 | LA**C**9FEE | 90 |
| | 1/4 x 1-1/2 | LA**C**9FEG | 90 |
| 19/#8 | 1/4 x 1 | LA**C**9GEE | 115 |
| | 1/4 x 1-1/2 | LA**C**9GEG | 115 |
| 19/#7 | 1/4 x 1 | LA**C**9HEE | 150 |
| | 1/4 x 1-1/2 | LA**C**9HEG | 150 |
| 19/#6 | 1/4 x 1 | LA**C**9JEE | 200 |
| | 1/4 x 1-1/2 | LA**C**9JEG | 200 |

[1] For CADWELD PLUS add suffix "PLUSF20" (refer page 44)

See page 30 for Lugs.




***LA*** ***Offset Lug***




***LA*** ***Straight Lug***

**LUGS FOR TYPE LA LUG CONNECTIONS**

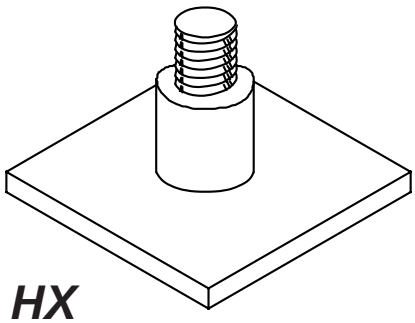
NEMA lugs for Type LA connections are made fom electrolytic grade copper bar stock to provide an efficient bolting surface for grounding applications. All listed lugs are tin plated.

For sizes not listed or for 45° or 90° lugs, contact Pentair or your local distributor or agent..

| LUG SIZE | NO. OF HOLES | BOLT SIZE | LA LUG PART NO. | | DIMENSIONS IN INCHES | | | | | | SIZE IN Kcmil |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | STRAIGHT | OFFSET | T | W | G | E | F* | H* | |
| 1/8 x 1 | 1 | 3/8 | B101CE | B101CEOL | 1/8 | 1 | 1/2 | 7/8 | 2-3/8 | 3-1/8 | 159 |
| | 2 | 1/2 | B102CE | B102CEOL | 1/8 | 1 | 5/8 | 3 | 4-1/2 | 5-1/4 | 159 |
| 3/16 x 1 | 1 | 1/2 | B101DE | B101DEOL | 3/16 | 1 | 9/16 | 1-1/8 | 2-7/8 | 3-5/8 | 239 |
| | 2 | 1/2 | B102DE | B102DEOL | 3/16 | 1 | 5/8 | 3 | 4-3/4 | 5-1/2 | 239 |
| | 2** | 3/8 | | B103DEOL | 3/16 | 1 | 7/16 | 1-7/8 | | 4-3/8 | 239 |
| 1/4 x 1 | 1 | 1/2 | B101EE | B101EEOL | 1/4 | 1 | 5/8 | 1-1/8 | 3 | 3-5/8 | 318 |
| | 2 | 1/2 | B102EE | B102EEOL | 1/4 | 1 | 5/8 | 3 | 4-7/8 | 5-5/8 | 318 |
| 1/4 x 1-1/2 | 1 | 5/8 | B101EG | B101EGOL | 1/4 | 1-1/2 | 3/4 | 1-1/2 | 3 | 4-1/8 | 478 |
| | 2 | 1/2 | B102EG | B102EGOL | 1/4 | 1-1/2 | 5/8 | 3 | 4-7/8 | 5-5/8 | 478 |
| 1/4 x 2 | 2 | 1/2 | B102EH | B102EHOL | 1/4 | 2 | 5/8 | 3 | 5-1/4 | 6 | 637 |
| 3/8 x 1-1/2 | 1 | 5/8 | B101GG | B101GGOL | 3/8 | 1-1/2 | 3/4 | 1-1/2 | 3-3/4 | 4-3/4 | 716 |
| | 2 | 1/2 | B102GG | B102GGOL | 3/8 | 1-1/2 | 5/8 | 3 | 5-3/4 | 7 | 716 |
| 3/8 x 2 | 1 | 5/8 | B101GH | B101GHOL | 3/8 | 2 | 1 | 2-1/8 | 4-3/8 | 5-5/8 | 955 |
| | 2 | 1/2 | B102GH | B102GHOL | 3/8 | 2 | 5/8 | 3 | 5-3/4 | 7 | 955 |
| 1/2 x 2 | 2 | 1/2 | B102JH | B102JHOL | 1/2 | 2 | 5/8 | 3 | 5-3/4 | 7 | 1374 |
| 1/4 x 3 | 4 | 1/2 | B104EK | B104EKOL | 1/4 | 3 | 5/8 | 3 | 5-1/2 | 6-1/4 | 955 |
| 3/8 x 3 | 4 | 1/2 | B104GK | B104GKOL | 3/8 | 3 | 5/8 | 3 | 6 | 7 | 1432 |
| 1/2 x 3 | 4 | 1/2 | B104JK | B104JKOL | 1/2 | 3 | 5/8 | 3 | 6-1/4 | 7-1/4 | 1910 |

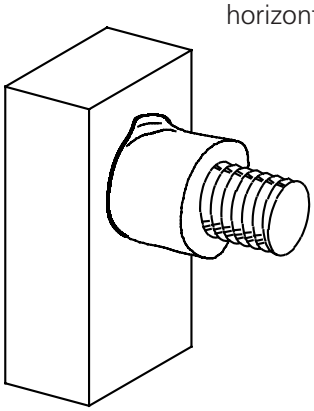
*Approximate

**Non-NEMA drillings. Two holes for 3/8" screws on 1" centers. For use with B1612Q CADWELD Ground Plate.



**HX**

Vertical stud to horizontal steel surface



**HV**

Horizontal stud to horizontal steel surface

## COPPER AND STEEL STUDS

- Connections of copper and steel studs to steel surfaces. Copper studs on grounded structures provide a convenient point of attachment of temporary protective ground clamps.
- **Bold letter** in mold part number is the price key.

## REQUIRED TOOLS

| | | Part No. |
|---|---|---|
| Handle Clamps | for C Price Key Molds | L160 |
| | for D Price Key Molds | L159 |
| CADWELD PLUS Control Unit or | | PLUSCU |
| Flint Ignitor | | T320 |

## SUGGESTED TOOLS

| | | |
|---|---|---|
| Mold Cleaning Brush | | T394 |
| Rasp | | T321 |
| Torch Head | | T111 |
| Mold Scraper Tool | | |
| | #65 w/m & smaller | B136A |
| | #90 w/m & larger | B136B |

## ACCESSORIES

- See Section A

### Type HX Connections for Steel Surfaces Only

**STEEL STUDS ONLY**

| STUD SIZE | MOLD PART NO. | TYPE HX WELD DIMENSIONS A (thickness) | B (diameter) | WELDING MATERIAL |
|---|---|---|---|---|
| 1/4″ | HX**C**10 | 3/8″ | 3/4″ | 25 |
| 5/16″ | HX**C**11 | 3/8″ | 3/4″ | 25 |
| 3/8″ | HX**C**12 | 9/16″ | 7/8″ | 45 |
| 1/2″ | HX**C**14 | 5/8″ | 1-1/16″ | 65 |
| 3/4″ | HX**C**18 | 5/8″ | 1-1/2″ | 150 |
| 1″ | HX**C**22 | 15/16″ | 1-5/8″ | 2-150 |

### Type HV Connections for Steel Surfaces only

**COPPER* STUDS ONLY**

| STUD SIZE | MOLD PART NO. | WELDING MATERIAL |
|---|---|---|
| 1/2″ | HV**C**14CU | 115 |
| 5/8″ | HV**C**31CU | 150 |
| 3/4″ | HV**C**33CU | 250 |
| 7/8″ | HV**D**35CU | 2-150 |
| 1″ | HV**D**37CU | 2-150 |

*or silicon bronze

### Type HV Connections for Steel Surfaces Only

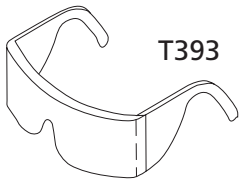
**STEEL STUDS ONLY**

| STUD SIZE | MOLD PART NO. | TYPE HX WELD DIMENSIONS A (thickness) | B (diameter) | WELDING MATERIAL |
|---|---|---|---|---|
| 1/4″ | HV**C**10 | 3/8″ | 3/4″ | 25 |
| 5/16″ | HV**C**11 | 3/8″ | 3/4″ | 25 |
| 3/8″ | HV**C**12 | 9/16″ | 7/8″ | 45 |
| 1/2″ | HV**C**14 | 5/8″ | 1-1/16″ | 65 |
| 3/4″ | HV**C**18 | 5/8″ | 1-1/2″ | 150 |
| 1″ | HV**C**22 | 15/16″ | 1-5/8″ | 250 |

# SAFETY FIRST

Pentair recommends SAFETY FIRST when making CADWELD Connections.

We offer the following gloves and glasses as shown

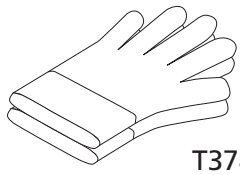



## Safety Glasses

These glasses may be worn separately or over prescription glasses.

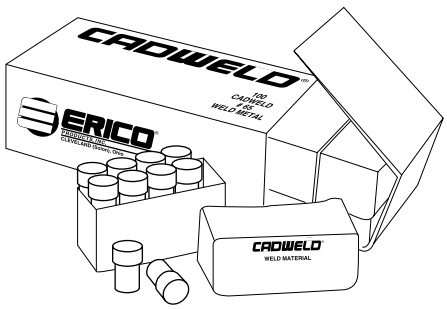
## Gloves

Heavy canvas gloves with leather palms.




# CADWELD WELDING MATERIAL

CADWELD Welding Material is a mixture of copper oxide and aluminum, packaged by size in plastic tubes. Each tube contains the starting material at the bottom of the plastic tube, with the Welding Material on top. These materials are not explosive and not subject to spontaneous ignition. These containers are packaged in boxes along with metal disks. Each weld uses one disk. Disks are included with the Welding Material.




Five types of CADWELD Welding Materials are used for grounding connections:

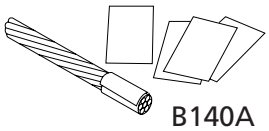
1. F20 or standard Welding Material is used for all grounding connections with the exception of those to cast iron or to load bearing rail. The Standard Welding Material containers have clear (or natural) caps. Standard Welding Material is also used with most FX molds.
2. XL Welding Material is used with CADWELD EXOLON molds. CADWELD EXOLON Welding Material containers have white caps.
3. XF-19 Alloy Welding Material is used for all connections to cast iron such as Type HB and others. XF-19 Welding Material containers have orange caps.

For DUCTILE IRON, see Section 3, Cast Iron Containers

4. CADWELD F80 Alloy Welding Material is used for all connections to load bearing rail such as Type W Bonds. F80 Welding Material containers have yellow caps.
5. Cathodic connections require different welding material and molds. Contact Pentair or your local distributor or agent.

# ADAPTING MOLDS TO FIT CONDUCTORS

Cables smaller than indicated on mold tag can be welded by using either Wrap Sleeve or Adapter Sleeves.



B140A

## CADWELD Wrap Sleeve B140A

CADWELD Wrap Sleeve is wrapped around the cable until the diameter is about the same as the cable opening in the mold.

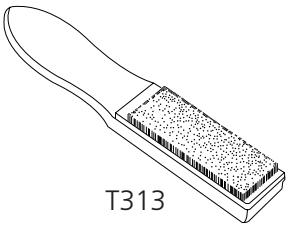

T403

## CADWELD Mold Sealer

T403 CADWELD Mold Sealer is ideal for sealing hot or cold molds to retard leakage from large stranded conductors. It is required on certain molds such as Types HA, HB, HC, VG and VN. It prolongs useful mold life when the cable opening becomes worn.

It is available in a convenient 2 pound package.

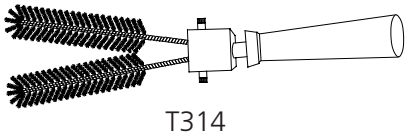
# CABLE AND WORK SURFACE PREPARATION



T313

## Cable Cleaning Brushes

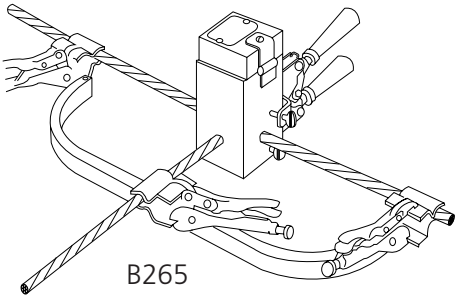
Two types of brushes are available to aid in removing oxides and cleaning copper surfaces. T313 Card Cloth Brush with short stiff bristles is generally preferred for cleaning concentric conductors and busbars, which are not heavily oxidized.



T314

## T314 Cable Cleaning Brush

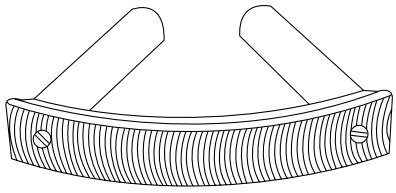
T314 Cable Cleaning Brush cleans any conductor and is especially useful for coarse or very dirty conductors. The brushes can be rotated to provide new cleaning bristles and are replaceable.



B265

## Cable Clamp B265

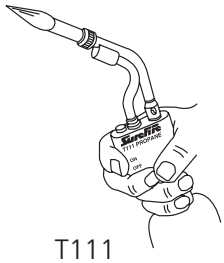
The B265 Cable clamp should be used with hard drawn copper cable, CCS conductors or any cable under tension. Use of the clamp aids in preventing cable movement and prolongs mold life.



T321

## Rasp

T321 rasp is used to remove rust from any steel surface or galvanizing from hot dipped galvanized steel to expose the bare steel for welding. The curved blade makes it an efficient tool for flat surfaces. T321A Replacement blades are also available.

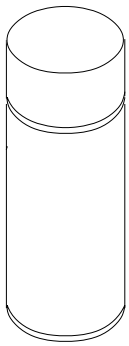


T111

## Surefire™ Torch Head

T111 Self igniting propane torch head. Squeeze the control knob for an instant flame. Release and it's out. No flame adjusting. The burn tip remains cool during normal use. Operates on its side or upside down. Can withstand 60 MPH winds without flareout. Fits all standard 14 and 16 oz. propane cylinders.

SUREFIRE™ is a trademark of IPI



T372A

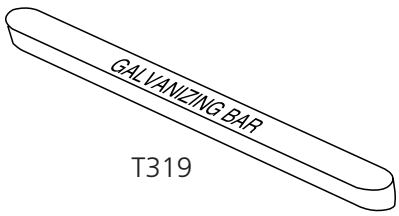
## Galvanizing Touch-Up

Easy to use galvanizing paint in a spray can is used to touch up heat affected areas on galvanized steel surfaces after welding. The damage to the galvanizing is often minimal so the repair is often cosmetic. T372A galvanizing compound available in 12 ounce aerosol can.


T358

## T358 Regalv

T358 Regalv is a 97% zinc rich organic coating which also can be used to repair galvanized surfaces. The brush is attached to the cap.

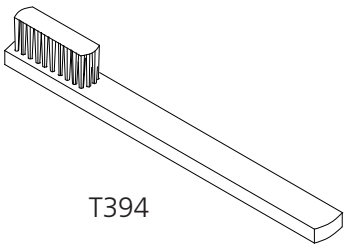



T319

## Galvanizing Bar

T319 Galvanizing Bar is used to repair a galvanized surface that has been damaged by welding or drilling. This is a low temperature, self-fluxing material. Often there is sufficient heat after making the CADWELD Connection to melt the bar or a small torch may be used.

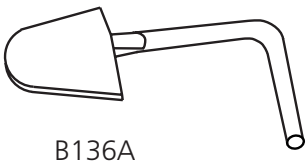
# MOLD CARE AND USE



T394

## Mold Cleaning Brush

Mold cleaning brush T394 is very useful for removing slag from molds – especially vertically split molds.

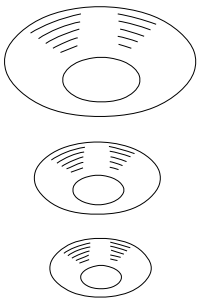


B136A
B136B

## Slag Removal Spades

Slag Removal Spades are useful for removing the slag after making a CADWELD Connection – especially useful with horizontally split molds.

| Slag Spade Part No. | Using Material Size |
|---|---|
| B-136-A | #65 & Smaller |
| B-136-B | #90 & Larger |

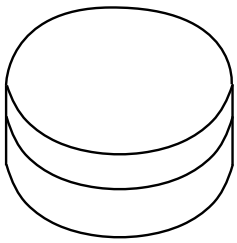


## Disks

Each time a weld is made, a new disk is required. The disk sits on the bottom of the crucible. Its purpose is to hold the powdered welding material until the reaction takes place. The slag produced by the reaction rises to the surface and the molten copper settles to the bottom of the crucible where it melts the disk and melts through the conductors to produce a permanent molecular bond.

Disks are available in three sizes:

B117A used in molds using #15 thru #32 welding material (3/4" diameter).
B117B used in molds using #45 thru #115 welding material (1" diameter).
B117C used in molds using #150 thru #500 welding material (1-1/2" diameter).
Disks are included with Welding Material and are not required for CADWELD PLUS.

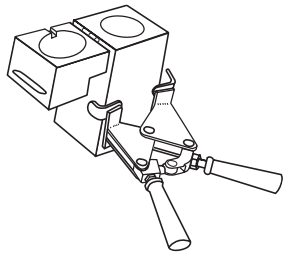


T328D

## Disk Kit

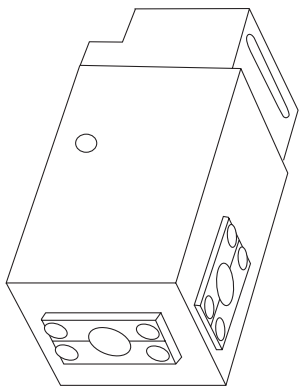
A disk container (T328) which includes 20 of each of the three sizes of steel disks is available for your convenience. Kit P/N T328D.

# CADWELD MOLDS



A semi-permanent graphite mold is used for making most CADWELD Connections. The mold controls the direction and speed of the molten CADWELD welding material flow and its final solidified shape. The graphite used in a CADWELD mold is a high temperature type that lasts for an average of 50 or more CADWELD connections under normal usage.

## Wear Plates



Wear Plates reduce mechanical abrasion of molds at cable entry points and help prevent leakage of molten metal (particularly on larger 7 strand conductor). These features prolong mold life.

Most CADWELD molds are available with factory mounted wear plates for the following sizes:

CCS conductors: 7/#10 thru 19/#6
Ground rods: 1/2" thru 1"

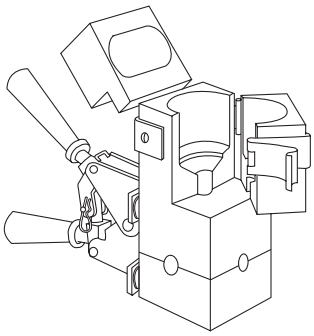
To order WEAR PLATES specify: Mold Part No. followed by the suffix "-W" i.e., TA**C**9F9FW.

Not available with types HA, HB, HC, LJ, certain PTs, & PCs, RR, VB, VF, VG VN, XA, CXBQ or XBZ.

Following are the number of Wear Plates (W.P.) used on the various types listed in this catalog.

| TYPE | W.P. | TYPE | W.P. | TYPE | W.P. |
|---|---|---|---|---|---|
| GB | 1 | HT | 2 | RC | 2 |
| GB-GR | 2 | LA | 1 | RD | 2 |
| GB-GT | 3 | LE | 2 | SS | 2 |
| GL | 1 | LL | 1* | TA | 3 |
| GR | 2 | PC | 2** | VS | 1 |
| GT | 3 | PT | 2** | VT | 2 |
| GY | 3 | RA | 1 | VV | 1 |
| HS | 1 | RB | 2 | XB | 4 |

*Available only on molds for 2" and narrower bus size.
**Available only on mold for 7/#10 and larger run and tap.



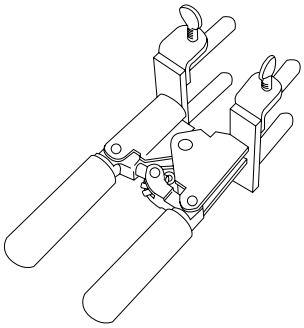
## Split Crucible Molds

Molds made with a horizontal opening and solid crucible section may be specified as a SPLIT CRUCIBLE TYPE. The SPLIT CRUCIBLE MOLD allows for easier cleaning, but lead times are longer.

To order a SPLIT CRUCIBLE TYPE specify: Mold Part No. followed by the suffix "-L" i.e., TA**C**2Q2QL.

Available in Type TA, XA, XB, (C & D mold price only), LE and LJ connections.

# MOLD FASTENING AND MOUNTING

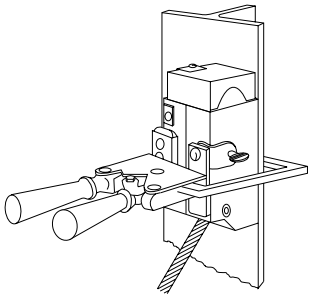


## CADWELD Handle Clamps

Handle Clamps such as the one shown are required for most molds. Specialized frames with handles are used on some molds. Flint ignitors are included with all Handle Clamps. The following Handle Clamps are most widely used.

1. L160 for all molds having a "C", "E", "Q", or "R" mold price key. (3" wide molds)

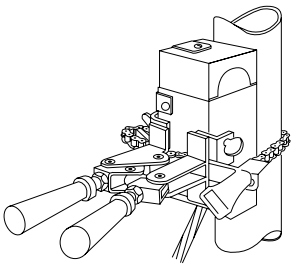
2. L159 for all molds having a "D", "F", "J" or "Z" mold price key. (4" wide molds)



## Vertical Surface Mold Support

The CADWELD mold can be securely held to a vertical "H" column or angle by using the Vertical Surface Mold Support. It is easily attached to an existing L159 or L160 Handle Clamp. For use with Types VB, VG, VN, and VS molds, fits steel up to 1" thick, for Type VF mold, 3/4" thick.

B134: For use with L160 E-Z CHANGE Handle Clamp
B135: For use with L159 E-Z CHANGE Handle Clamp

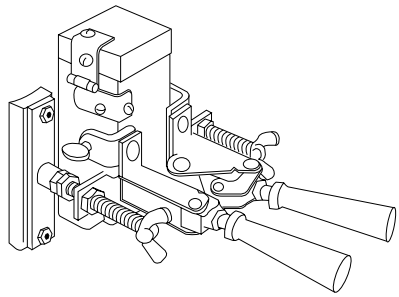


## Chain Support Handle Clamps

The CADWELD mold can be securely held to a pipe using the clamp assembly consisting of a modified L159 or L160 Handle Clamp with built-in Pipe Attachment.

| Clamp Part No. | Fits Mold Price | For Following Connection Types | Pipe |
|---|---|---|---|
| B159V | D & F | VS,VF,VB, & VV | Vertical |
| B160V | C & R | VS,VF,VB, & VV | Vertical |
| B159VT | D & F | VT | Vertical |
| B160VT | C & R | VT | Vertical |
| B159H | D & F | HA,HS,HC, & HT | Horizontal |
| B160H | C & R | HA,HS,HC, & HT | Horizontal |

The above clamps are equipped with 20" length of chain which will fit up to 4" pipes. Extra 20" length of chain, B158, is available to fit up to 10" pipes.

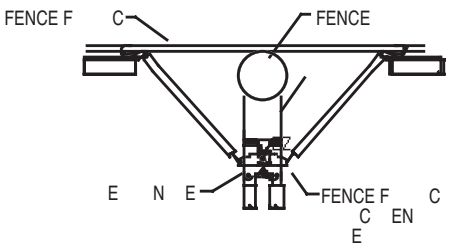


## Magnetic Handle Clamps

The CADWELD mold can be securely held to a large flat or slightly curved vertical surface using the Handle Clamp with Magnetic Support. Used on vertically split molds.

| Clamp Part No. | Fits Mold Price Key | Minimum Width Required* |
|---|---|---|
| B396 | C & R Price Key | 8″ |
| B159M | D & F Price Key | 10-1/2″ |
| B399AM | T Price Key | 6″ |
| B399BM | P & N Price Key | 7″ |

*Width will vary slightly depending upon the type of connection being made.




## Fence Fabric Attachment Assembly

An easy to use, labor saving, Fence Fabric Attachment Assembly fastens to your existing L159 or L160 Handle Clamp to firmly hold your mold to the fence post after the fence fabric has been attached. Ideal for retrofit jobs.

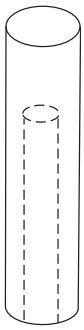
| Fence Fabric Attachment Part No. | Fits Handles |
|---|---|
| B827A | L160, L159 |

# GROUND ROD SPECIALTY TOOLS

### Ground Rod Drivers

| Product # | Description |
|---|---|
| EGRD58 | 5′ Driver body with insert for up to 5/8″ ground rods |
| EGRD58I* | Replacement insert for 5/8″ copper-bonded ground rods |
| EGRD34 | 5′ Driver body with insert for up to 3/4″ ground rods |
| EGRD34I* | Replacement insert for 3/4″ copper-bonded ground rods and 5/8″ galvanized ground rods |

*Both 5/8″ and 3/4″ inserts fit standard body of EGRD58 or EGRD34.

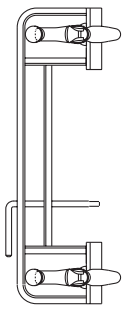


### Ground Rod Driving Sleeves**

Use a CADWELD ground rod driving sleeve to prevent mushrooming top of ground rod.

| Ground Rod Size | Part No. |
|---|---|
| 1/2″ Copper Bonded or Steel Rod | B137-14 |
| 5/8″ Copper Bonded (.563″ diameter) | B137-16 |
| 5/8″ Steel (.625″ diameter) | B137-31 |
| 3/4″ Copper Bonded (.682″ diameter) | B137-18 |
| 3/4″ Steel (.750″ diameter) | B137-33 |
| 1″ Copper Bonded (.914″ diameter) | B137-22 |
| 1″ Steel (1.00″ diameter) | B137-37 |

** For plain (unthreaded) ground rods only.

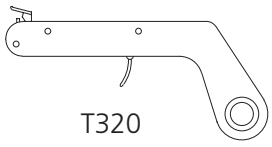


B120

### Ground Rod Splice Clamp

The B120 Ground Rod Splice Clamp must be used to support the upper rod and provide a method of correctly positioning the rods and mold while splicing the rods. (Type HDGB and GB Connection).

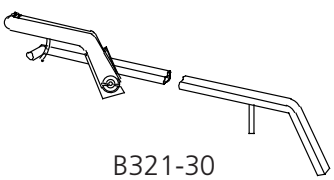
# OTHER TOOLS



T320

### Flint Ignitors

T320 CADWELD Flint Ignitors are used to ignite the starting material when making a CADWELD Connection. An ignitor is included with each Handle Clamp or frame. T320A Replacement Flints are also available.



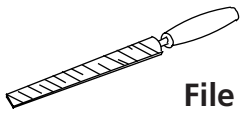
B321-30

### Flint Ignitor Extension

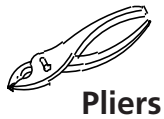
B321-30 Flint Ignitor Extension attaches to the T320 Flint Ignitor and allows the installer to be about 30″ from the mold. Ideal for such operations where the mold is in a narrow trench and the installer is at ground level.

T306

**Ceramic Blanket**
The woven Ceramic Blanket (Part T306) can be used to hold a hot mold or keep the work surface free of slag when cleaning the mold.

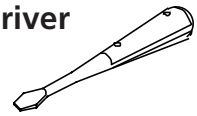


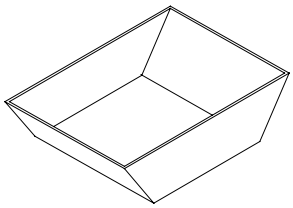
**File**
T329



**Pliers**
T304

**Screwdriver**
T305



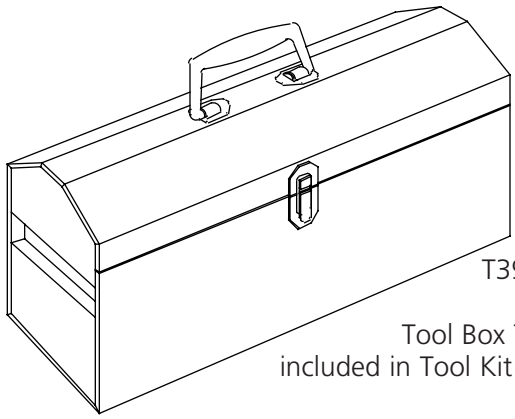


XLB974-B2

**Welding Tray**
The Welding Tray (Part No. XLB974-B2) can contain a spill of molten welding material. It is for personnel safety. Recommended when working overhead or over expensive equipment.

# TOOL KITS

**Tool Box T396**
A tool box is highly recommended to carry tools, molds, welding material and a propane torch.

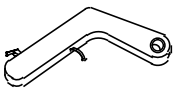


T396

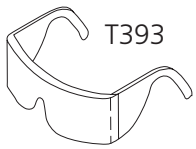
Tool Box T396 is included in Tool Kit T315A

**Tool Kit T315A**
Other Tool Kits can be made for your particular requirements.

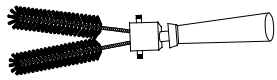
B136A



T320

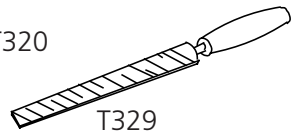


T393

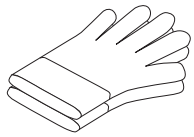


T314

T328D

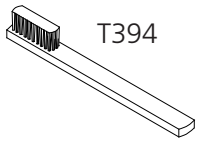


T329

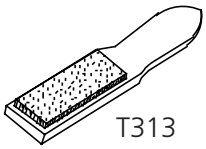


T378L

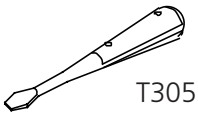
T304



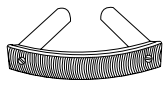
T394



T313



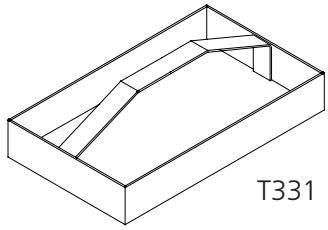
T305



T321

# TOOL TRAY

**Tool Tray Only: T331**
Ideal for carrying one or two molds, welding material, propane torch and tools.



T331

Tool Tray T331 is not included in Tool Kit T315A

# Ground System Testers

### EST Series

| Product # | Description |
|---|---|
| EST3640 | 2-pole and 3-pole ground/earth resistance measurements, 10mΩ to 1999Ω |
| EST4610 | 2-, 3- and 4-point soil resistance measurements, 10mΩ to 1999Ω |
| EST4630 | 2-, 3- and 4-point measurements, rechargeable 9.6V NiMH battery pack and durable case |
| EST6472 | 3- and 4-point measurements up to 99,000Ω, uses 2-clamp method (selective ground testing), frequency scan from 40 to 5078Hz for optimum test accuracy in electrically noisy environments, automatic calculation of Rho |
| ESR182 | Clamp-on probe for use with EST6472 |
| EST401 | Clamp-on ground resistance tester |
| ESTREELKIT500 | Set of two 500-ft test leads on heavy duty insulated thermoplastic 11" diameter reels with integral carrying handle, ideal for three point fall-of-potential measurements at large sites, cranks for fast test lead retrieval |

EST3640

EST4610

EST4630

EST6472

### EST401

The EST401 clamp-on ground resistance tester measures ground rod and small grid resistance without the use of auxillary ground rods. The EST401 can be used in multi-grounded systems without disconnecting the ground under test. By performing measurements on intact ground systems, the user can measure the resisance to ground and verify the continuity of the grounding connections and bonds. With the current management function, the EST401 is ideal for measuring ground current at pole ground rods, service entrances, pad-mounted transformers, transmission towers and service panels.

## The CADWELD PLUS system:

***Proven Safety and Proven Performance with No Equal***

- Consists of a tamper proof, disposable, moisture-resistant welding material cup. The welding material, disk and ignition source are incorporated into the self-contained package
- Long shelf life
- Completes welds at distances of up to 6 ft/1.8 meters (up to 15 ft/4.6 meters with optional lead)
- Requires minimum components – no starting material, no disks, no flint igniters
- Easy to handle, store and transport – by air, land or sea in unlimited quantities
- Reduces installation time
- Has color-coded welding material containers – by size and alloy type – for easy identification
- Has electronic ignition with a CE/UL battery powered controller box that is designed for 600 connections with one set of 8 standard AA batteries (included) – requiring no special batteries or chargers
- Designed for use in standard CADWELD molds including CADWELD MULTI

## Installation is Easy!

*4 Simple Steps For Permanently Welded Electrical Connections*

**1**

*Insert CADWELD PLUS package into mold (may require use of a cover/baffle)*

**2**

*Attach control unit termination clip to ignition strip*

**3**

*Press and hold control unit switch and wait for the ignition*

**4**

*Open the mold and remove the expended steel cup – no special disposal required*

CADWELD PLUS Control Unit initiates the reaction of the metal crucible. The standard unit includes a 6-foot (1.8 meter) 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.

## CADWELD PLUS uses the following color codes and general product nomenclature:

### CADWELD PLUS for Grounding Applications

| Traditional Welding Material Part Number (Clear Cap) | CADWELD PLUS Part Number | European Article Number | Size Indentification Ring Color |
|---|---|---|---|
| 15 | 15PLUSF20 | 165700 | Black |
| 25 | 25PLUSF20 | 165701 | Red |
| 32 | 32PLUSF20 | 165702 | White |
| 45 | 45PLUSF20 | 165703 | Light Blue |
| 65 | 65PLUSF20 | 165704 | Dark Green |
| 90 | 90PLUSF20 | 165705 | Gray |
| 115 | 115PLUSF20 | 165706 | Orange |
| 150 | 150PLUSF20 | 165707 | Dark Blue |
| 200 | 200PLUSF20 | 165708 | Yellow |
| 250 | 250PLUSF20 | 165709 | Purple |
| use 2 x 150 | 300PLUSF20 | 165710 | Light Green |
| use 2 x 200 | 400PLUSF20 | 165711 | Brown |
| 500 | 500PLUSF20 | 165712 | Light Brown |

PLUSCU

PLUSCULD

### Accessories

| Part Number | European Article Number | Description |
|---|---|---|
| PLUSCU | 165738 | CADWELD PLUS Control Unit with plug-in, replaceable lead |
| PLUSCU15L | 165745 | CADWELD PLUS Control Unit with 15 ft. (4.6 m) plug-in, replaceable lead |
| MC2X2KIT | 165740 | Kit, Baffle Cover, Graphite - 2" X 2" Mold |
| MC25X3KIT | 165744 | Kit, Baffle Cover, Graphite - 2½" X 3" Mold |
| MC3X3KIT | 165741 | Kit, Baffle Cover, Graphite - 3" X 3" Mold |
| MC4X4KIT | 165742 | Kit, Baffle Cover, Graphite - 4" X 4" Mold |
| PLUSCULDQC | PLUSCULDQC | Plug-in, Replacement Lead, 6 ft. (1.8 m) |
| PLUSCULD15QC | PLUSCULD15QC | Plug-in, Replacement Lead, 15 ft. (4.6 m) |

Gram weight PLUS weld metal type **i.e. 45PLUSF20**

CADWELD PLUS Patent Numbers 6,553,911 6,703,578

## COPPER-CLAD STEEL CONDUCTORS

| CADWELD Cable Code | Cable Stranding | Nominal Dia. (inches) | Cross Sectional Area (kcmil) |
|---|---|---|---|
| **7Y** | 3/#10 | .220 | 31.15 |
| **7X** | 3/#9 CW | .247 | 39.28 |
| **9Y** | 3/#8 CW | .277 | 49.53 |
| **9A** | 7/#10 CW | .306 | 72.68 |
| **9X** | 3/#7 CW | .311 | 62.45 |
| **9T** | 7/#9 CW | .343 | 91.65 |
| **9W** | 3/#6 CW | .349 | 78.75 |
| **9B** | 7/#8 CW | .385 | 115.60 |
| **9V** | 3/#5 CW | .392 | 99.31 |
| **9C** | 7/#7 CW | .433 | 145.70 |
| **9D** | 7/#6 CW | .486 | 183.80 |
| **9E** | 7/#5 CW | .546 | 231.71 |
| **9F** | 19/#9 CW | .572 | 248.80 |
| **9L** | 7/#4 CW | .613 | 292.20 |
| **9G** | 19/#8 CW | .642 | 313.70 |
| **9H** | 19/#7 CW | .721 | 395.50 |
| **7W** | 37/#9 CW | .801 | 484.40 |
| **9J** | 19/#6 CW | .810 | 498.80 |
| **7V** | 37/#8 CW | .899 | 610.90 |
| **9K** | 19/#5 CW | .910 | 628.90 |
| **9M** | 37/#7 CW | 1.010 | 770.30 |

## GROUND RODS

| Nominal Size | Material | Type | Thread Size | Rod Diameter | CADWELD Ground Rod Code |
|---|---|---|---|---|---|
| 1/2″ | Copper-bonded | Sectional | 9/16″ | .505 | 14 |
| | Steel* | Plain | – | .500 | 14 |
| | Copper-bonded | Plain | – | .475 | 15 |
| | Copper-bonded | Sectional | 1/2″ | .447 | 13 |
| 5/8″ | Copper-bonded | Sectional | 5/8″ | .563 | 16 |
| | Steel* | Plain | – | .625 | 31 |
| | Galvanized Steel** | Plain | – | .631 | 31 |
| | Copper-bonded | Plain | – | .563 | 16 |
| 3/4″ | Copper-bonded | Sectional | 3/4″ | .682 | 18 |
| | Steel* | Plain | – | .750 | 33 |
| | Copper-bonded | Plain | – | .682 | 18 |
| 1″ | Copper-bonded | Sectional | 1″ | .914 | 22 |
| | Steel* | Plain | – | 1.00 | 37 |
| | Copper-bonded | Plain | – | .914 | 22 |

* Plain steel, stainless steel and stainless steel clad rods.
** Manufactured in accordance with NEMA GR-1.

## BARE CLASS A, B, AND C CONCENTRIC STRANDED CONDUCTOR

Based on A.S.T.M. Standard Specifications.

| CADWELD Cable code | Size in Circular mils | Size A.W.G. | Conductor Dia. In. | NUMBER OF WIRES / Strand Dia. Inches | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 7 | 19 | 37 | 61 | 91 |
| **4Y** | 1,000,000 | | 1.152 | | | .1644* | .1280 | .1048 |
| **4Q** | 800,000 | | 1.031 | | | .1470* | .1145 | .0938 |
| **4L** | 750,000 | | .998 | | | .1424* | .1109 | .0908 |
| **4G** | 700,000 | | .964 | | | .1375* | .1071 | .0877 |
| **3X** | 600,000 | | .893 | | | .1273 | .0992 | .0812 |
| **3Q** | 500,000 | | .813 | | .1622* | .1162 | .0905 | |
| **3H** | 400,000 | | .728 | | .1451 | .1040 | .0810 | |
| **3D** | 350,000 | | .681 | | .1357 | .0973 | .0757 | |
| **3A** | 300,000 | | .630 | | .1257 | .0900 | .0701 | |
| **2V** | 250,000 | | .575 | | .1147 | .0822 | .0640 | |
| **2Q** | 211,600 | 4/0 | .528 | .1739 | .1055 | .0756 | | |
| **2L** | 167,800 | 3/0 | .470 | .1548 | .0940 | .0673 | | |
| **2G** | 133,100 | 2/0 | .419 | .1379 | .0837 | .0600 | | |
| **2C** | 105,500 | 1/0 | .373 | .1228 | .0745 | .0534 | | |
| **1Y** | 83,690 | 1 | .332 | .1093 | .0664 | .0476 | | |
| **1V** | 66,370 | 2 | .292 | .0974 | .0591 | | | |
| **1Q** | 52,630 | 3 | .260 | .0867 | .0526 | | | |
| **1L** | 41,740 | 4 | .232 | .0772 | .0469 | | | |
| **1H** | 26,240 | 6 | .184 | .0612 | .0372 | | | |
| **1E** | 16,510 | 8 | .146 | .0486 | .0295 | | | |
| **1B** | 10,380 | 10 | .116 | .0385 | .0234 | | | |
| | 6,530 | 12 | .092 | .0305 | .0185 | | | |
| | 4,110 | 14 | .073 | .0242 | .0147 | | | |

* Class AA

## BARE SOLID COPPER WIRE

Based on A.S.T.M. Standard Specifications

| CADWELD Cable code | Size A.W.G. | Cross Sectional Area Circular Mils | Wire Dia. In. |
|---|---|---|---|
| **2P** | 4/0 | 211,600 | .4600 |
| **2K** | 3/0 | 167,800 | .4096 |
| **2F** | 2/0 | 133,100 | .3648 |
| **2B** | 1/0 | 105,500 | .3249 |
| **1X** | 1 | 83,690 | .2893 |
| **1T** | 2 | 66,370 | .2576 |
| **1P** | 3 | 52,630 | .2294 |
| **1K** | 4 | 41,740 | .2043 |
| **1G** | 6 | 26,250 | .1620 |
| **1D** | 8 | 16,510 | .1285 |
| **1A** | 10 | 10,380 | .1019 |
| | 12 | 6,530 | .0808 |
| | 14 | 4,110 | .0064 |

## RECTANGULAR COPPER BUSBAR

| CADWELD Busbar Code | Thickness Inches | Width Inches | Circular Mil Size | Weight Lbs. per Foot |
|---|---|---|---|---|
| CE | 1/8 | 1 | 159,200 | .484 |
| CG | | 1-1/2 | 238,700 | .726 |
| CH | | 2 | 318,300 | .969 |
| DE | 3/16 | 1 | 238,700 | .727 |
| DH | | 2 | 477,500 | 1.45 |
| EE | 1/4 | 1 | 318,300 | .969 |
| EG | | 1-1/2 | 477,500 | 1.45 |
| EH | | 2 | 636,600 | 1.94 |
| EK | | 3 | 954,900 | 2.91 |
| EM | | 4 | 1,273,000 | 3.88 |
| GE | 3/8 | 1 | 477,500 | 1.45 |
| GG | | 1-1/2 | 716,200 | 2.18 |
| GH | | 2 | 954,900 | 2.91 |
| GK | | 3 | 1,432,000 | 4.36 |
| GM | | 4 | 1,910,000 | 5.81 |
| JH | 1/2 | 2 | 1,273,000 | 3.88 |
| JK | | 3 | 1,910,000 | 5.81 |
| JM | | 4 | 2,546,000 | 7.75 |

## CAST IRON PIPE – CLASS A THRU D

### AWWA Specification 1908, ASA A21.2 Class 100-250.

| Nominal Size (Inches) | Actual O.D. (Inches) |
|---|---|
| 4 | 4.80 to 5.00 |
| 6 | 6.90 to 7.10 |
| 8 | 9.05 to 9.30 |
| 10 | 11.10 to 11.40 |
| 12 | 13.20 to 13.50 |
| 14 | 15.30 to 15.70 |
| 16 | 17.40 to 17.80 |
| 18 | 19.50 to 19.90 |
| 20 | 21.60 to 22.1 |
| 24 | 25.80 to 26.30 |
| 30 | 31.70 to 32.70 |
| 36 | 38.00 to 39.20 |
| 42 | 44.20 to 45.60 |
| 48 | 50.50 to 52.00 |
| 54 | 56.70 to 58.40 |
| 60 | 62.80 to 64.80 |
| 72 | 75.30 to 76.90 |
| 84 | 87.50 to 88.50 |

## Other Standard Sections used for Fence Posts

| Section | CADWELD Mold Code |
|---|---|
| 1-1/2" square | PS15 |
| 2" square | PS20 |
| 2-1/2" square | PS25 |
| 3" square | PS30* |
| 1.875 x 1.625 x .133 "H" | PH1 |
| 2.25 x 1.95 x .143 "H" | PH2 |

* For D or F mold price only

## STANDARD STEEL WIRE GAGE

### (WASHBURN MOEN GAGE) SOLID

| Gage No. | Dia. Inches | Gage No. | Diameter Inches |
|---|---|---|---|
| 7/0 | .4900 | 6 | .1920 |
| 6/0 | .4615 | 7 | .1770 |
| 5/0 | .4305 | 8 | .1620 |
| 4/0 | .3938 | 9 | .1483 |
| 3/0 | .3625 | 10 | .1350 |
| 2/0 | .3310 | 11 | .1205 |
| 1/0 | .3065 | 12 | .1055 |
| 1 | .2830 | 13 | .0915 |
| 2 | .2625 | 14 | .0800 |
| 3 | .2437 | 15 | .0720 |
| 4 | .2253 | 16 | .0625 |
| 5 | .2070 | 17 | .0540 |

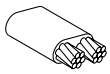
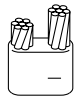
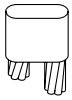
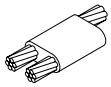
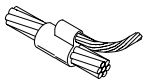
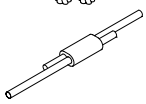
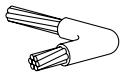
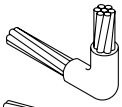
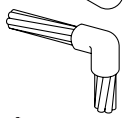
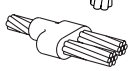
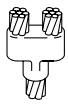
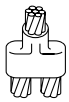
## STEEL PIPE SIZES

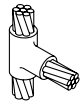
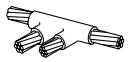
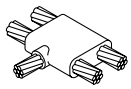
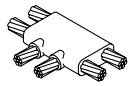
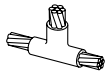
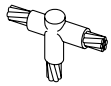
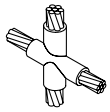
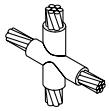
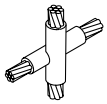
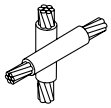
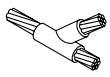
**STANDARD WEIGHT (SCHEDULE 40)** **ASTM A53-90-B ANSI/ASME B36.10M-1985**

| Nominal Size In | O.D. Inches | Wall Thickness Inches | CADWELD Mold Code |
|---|---|---|---|
| 1 | 1.315 | .133 | 1 |
| 1-1/4 | 1.660 | .140 | 1.25 |
| 1-1/2 | 1.900 | .145 | 1.50 |
| 2 | 2.375 | .154 | 2 |
| 2-1/2 | 2.875 | .203 | 2.50 |
| 3 | 3.500 | .216 | 3 |
| 3-1/2 | 4.000 | .226 | 3.50 |
| 4 | 4.500 | .237 | 4 |
| 5 | 5.563 | .258 | 5 |
| 6 | 6.625 | .280 | 6 |
| 8 | 8.625 | .322 | 8 |
| 10 | 10.750 | .365 | 10 |

# Other Cable to Cable Connections

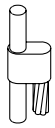
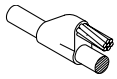
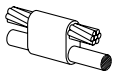
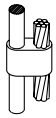
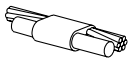
The connections shown below are for use only where connections shown in this catalog are not suitable.

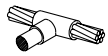
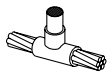
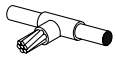
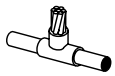
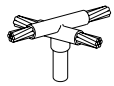
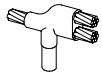
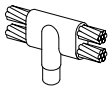
| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Parallel dead end** | PJ |  | 1 | V |
| | PK |  | 2 | * |
| | PM |  | 3 | V |
| | PN |  | 3 | V |
| **Parallel Tap** | PH |  | 3 | V |
| | PA |  | 2 | * |
| | PB |  | 3 | V |
| | PC |  | 1 | V |
| | PD |  | 3 | V |
| | PG |  | 1 | V |
| **Splice** | PP |  | 1 | * |
| | PQ |  | 3 | V |
| | PR |  | 2 | V |
| | SC |  | 1 | * |
| | SD |  | 3 | V |
| | SE |  | 3 | V |
| | SV |  | 3 | V |

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Tee** | TC |  | 3 | V |
| | TD |  | 3 | * |
| | TE |  | 3 | * |
| | TF |  | 3 | V |
| | TL |  | 3 | V |
| | TV |  | 3 | V |
| **X vertical (horizontal cable uncut)** | XC |  | 3 | V |
| **X vertical (vertical cable uncut)** | XD |  | 3 | V |
| **X vertical (neither cable cut)** | XF |  | 3 | * |
| **X vertical (neither cable cut)** | XG |  | 3 | * |
| **X - 45° tap** | YC |  | 3 | V |
| | YD |  | 3 | V |
| | YE |  | 3 | V |

# Other Cable to Ground Rods or Other Connections

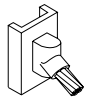
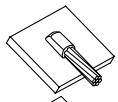
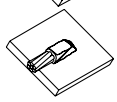
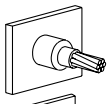
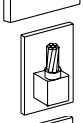
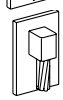
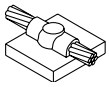
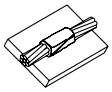
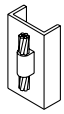
The connections shown below are for use only where connections shown in this catalog are not suitable.

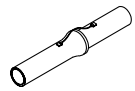
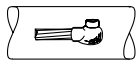
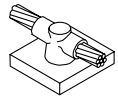
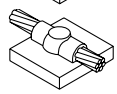
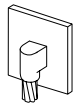
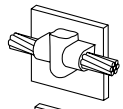
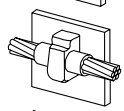
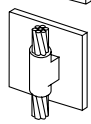
| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Parallel tap** | GQ |  | 3 | V |
| | GS |  | 1 | V |
| **Parallel thru** | DQ |  | 1 | V |
| | GP |  | 3 | V |
| | GW |  | 1 | V |
| **Splice** | GD |  | 3 | V |
| | GE |  | 1 | V |
| | GF |  | 1 | V |
| | GV |  | 1 | V |

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Tee** | GG |  | 1 | * |
| | GH |  | 3 | V |
| | GJ |  | 1 | * |
| | GK |  | 3 | V |
| | GM |  | 2 | V |
| | GN |  | 2 | V |
| | GX |  | 3 | V |
| | NB |  | 4 | * |
| | NC |  | 1 | V |
| | ND |  | 1 | V |
| **Y - 45° tap** | VW |  | 2 | V |

# Other Cable to Steel or Cast Iron Connections

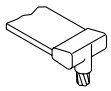
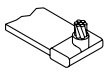
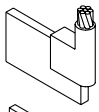
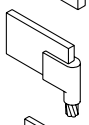
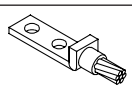
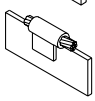
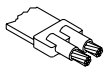
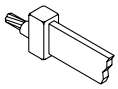
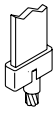
The connections shown below are for use only where connections shown in this catalog are not suitable.

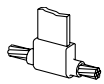
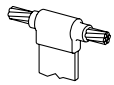
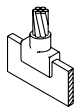
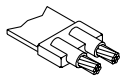
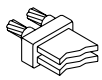
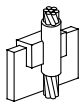
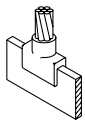
| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Tap cast iron** | VH |  | 1 | V |
| | VJ |  | 1 | V |
| | VK |  | 1 | V |
| | VR |  | 1 | V |
| **Tap steel** | HF |  | 1 | * |
| | HG |  | 2 | * |
| | VA |  | 1 | V |
| | VC |  | 1 | V |
| | VE |  | 2 | V |
| | VL |  | 1 | V |
| **Thru cast iron** | HE |  | 1 | * |
| **Thru steel** | HJ |  | 2 | * |
| | HK |  | 1 | V |
| | VX |  | 2 | V |

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Pipe** | HB |  | 1 | * |
| | VN |  | 1 | * |
| **Other connections to steel** | HC |  | 1 | * |
| | HT |  | 1 | V |
| | VF |  | 1 | V |
| | VB |  | 2 | V |
| | VG |  | 1 | V |
| | VT |  | 1 | |
| | VV |  | 1 | V |

# Other Cable to Busbar or Lug Connections

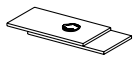
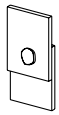
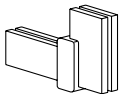
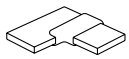
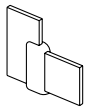
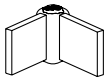
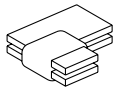
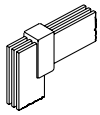
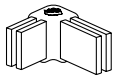
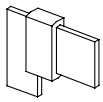
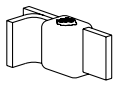
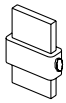
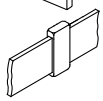
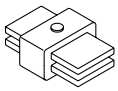
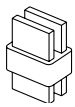
The connections shown below are for use only where connections shown in this catalog are not suitable.

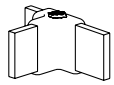
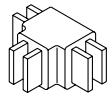
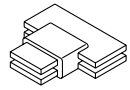
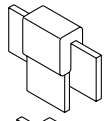
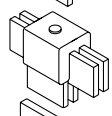
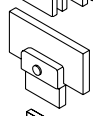
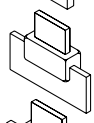
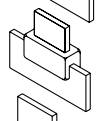
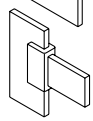
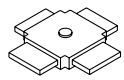
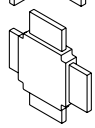
| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Ell** | DN |  | 2 | V |
| | LX |  | 2 | * |
| | LY |  | 3 | * |
| | MA |  | 2 | * |
| | MB |  | 3 | * |
| | MC |  | 3 | * |
| | MD |  | 3 | * |
| | ME |  | 2 | * |
| | MF |  | 3 | * |
| | MG |  | 2 | V |
| **Lug** | PL |  | 1 | V |
| **Parallel tap** | LV |  | 1 | V |
| **Parallel thru** | LW |  | 1 | V |
| **Splice** | DM |  | 2 | * |
| | DS |  | 2 | * |
| | LB |  | 1 | V |
| | LC |  | 3 | V |

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Splice** | LD |  | 3 | V |
| | LF |  | 3 | * |
| | LG |  | 3 | V |
| | LH |  | 3 | * |
| | LK |  | 2 | V |
| | LL |  | 1 | V |
| | LM |  | 1 | V |
| | LN |  | 4 | * |
| | LP |  | 2 | * |
| | LS |  | 2 | * |
| | LT |  | 2 | * |
| | LQ |  | 2 | V |
| **Tee** | LR |  | 2 | * |

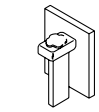
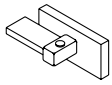
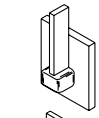
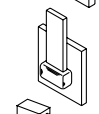
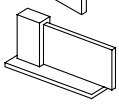
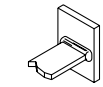
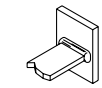
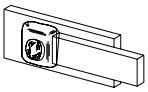
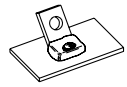
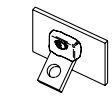
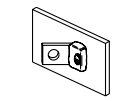
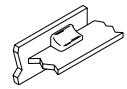
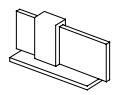
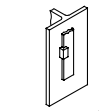
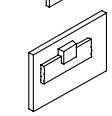
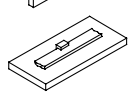
# Other Busbar to Busbar Connections

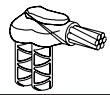
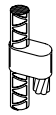
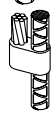
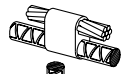
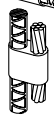
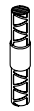
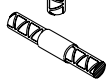
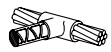
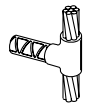
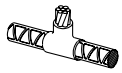
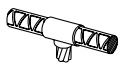
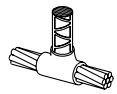
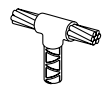
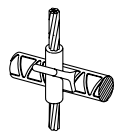
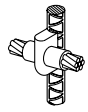
The connections shown below are for use only where connections shown in this catalog are not suitable.

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Button-weld** | TW |  | 1 | * |
| | TX |  | 1 | V |
| **Ell** | DJ |  | 4 | V |
| | EN |  | 2 | * |
| | EQ |  | 4 | V |
| | ER |  | 2 | * |
| | ES |  | 3 | * |
| | ET |  | 2 | V |
| | EV |  | 3 | * |
| | EP |  | 1 | V |
| **Parallel tap** | BJ |  | 2 | V |
| **Splice** | BC |  | 3 | V |
| | BD |  | 3 | * |
| | BF |  | 2 | * |
| | BG |  | 2 | * |
| | BH |  | 4 | V |

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Tee** | BK |  | 2 | * |
| | BL |  | 3 | * |
| | BN |  | 3 | * |
| | BR |  | 2 | V |
| | BS |  | 2 | V |
| | BT |  | 4 | * |
| | BV |  | 3 | * |
| | DE |  | 3 | V |
| | EE |  | 3 | V |
| **X** | EA |  | 4 | V |
| | EC |  | 4 | * |
| | ED |  | 4 | V |

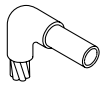
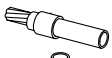
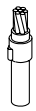
# Other Busbar Connections / Other Rebar Connections

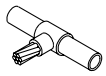
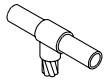
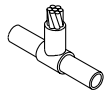
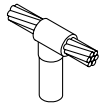
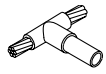
| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Tap** | BX |  | 3 | V |
| | BY |  | 3 | V |
| | CA |  | 3 | V |
| | CB |  | 2 | V |
| | CJ |  | 2 | V |
| | DC |  | 3 | * |
| | DD |  | 3 | V |
| | DF |  | 2 | V |
| | HL |  | 1 | V |
| | HM |  | 1 | V |
| | HN |  | 1 | * |
| **Thru** | CD |  | 3 | V |
| | CK |  | 2 | V |
| | CF |  | 1 | V |
| | CC |  | 1 | V |
| | CH |  | 1 | V |

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Ell** | DT |  | 2 | V |
| **Parallel tap** | DR |  | 2 | V |
| | RV |  | 2 | V |
| **Parallel thru** | RT |  | 2 | V |
| | RW |  | 2 | V |
| **Splice** | RE |  | 2 | V |
| | RF |  | 2 | V |
| | RG |  | 1 | V |
| | SF |  | 2 | V |
| | SR |  | 1 | V |
| **Tee** | RH |  | 1 | * |
| | RK |  | 1 | * |
| | RL |  | 2 | V |
| | RM |  | 2 | V |
| | RN |  | 2 | V |
| | RP |  | 2 | V |
| | RQ |  | 2 | V |
| **X** | XJ |  | 1 | * |
| | RC |  | 1 | V |

# Cable to Copper Tube Connections

The connections shown below are for use only where connections shown in this catalog are not suitable.

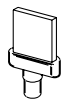
| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Ell** | DP |  | 1 | * |
| | MV |  | 2 | V |
| | MW |  | 3 | V |
| | MX |  | 2 | V |
| | MY |  | 3 | V |
| **Splice** | MH |  | 1 | V |
| | MJ |  | 3 | V |
| | MK |  | 3 | V |

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Tee** | ML |  | 1 | * |
| | MM |  | 3 | * |
| | MP |  | 3 | * |
| | MQ |  | | |
| | MR |  | 3 | * |
| | MS |  | 3 | * |
| | MT |  | 3 | * |
| | NA |  | 1 | * |

# Busbar to Ground Rods Connections

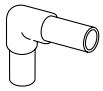
The connections shown below are for use only where connections shown in this catalog are not suitable.

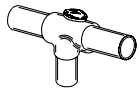
| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Ell** | CL |  | 1 | V |
| **Tee** | CM |  | 3 | V |

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Splice** | CS |  | 3 | V |
| **Tee** | CQ |  | 3 | V |
| | CR |  | 1 | V |

# Copper Tube to Ground Rods Connections

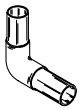
The connections shown below are for use only where connections shown in this catalog are not suitable.

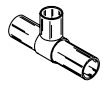
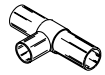
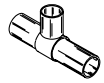
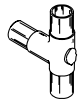
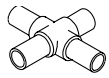
| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Ell** | FT |  | 1 | V |

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Tee** | FV |  | 1 | V |

# Copper Tube to Copper Tube Connections

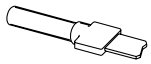
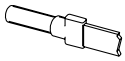
The connections shown below are for use only where connections shown in this catalog are not suitable.

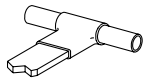
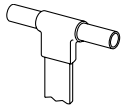
| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Ell** | FK |  | 1 | * |
| | FL |  | 3 | V |
| | FM |  | 2 | V |
| **Splice** | FD1 |  | V | |
| | FE |  | 3 | V |

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Tee** | FH |  | 3 | V |
| | FF |  | 1 | * |
| | FG |  | 2 | V |
| | FH |  | 3 | V |
| | FJ |  | 3 | V |
| **X** | XT |  | 4 | * |

# Copper Tube to Busbar or Lugs Connections

The connections shown below are for use only where connections shown in this catalog are not suitable.

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Splice** | FN |  | 1 | * |
| | FP |  | 1 | V |
| **Tee** | EW |  | 2 | V |

| NAME | TYPE | | EASE | SPLIT |
|---|---|---|---|---|
| **Tee** | FR |  | 2 | * |
| | FS |  | 1 | V |

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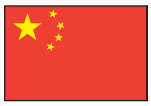

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