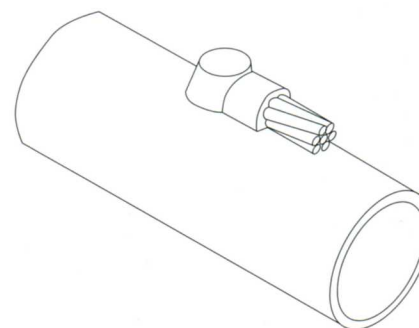


Tap conductor to top of horizontal STEEL pipe or flat surface.
Note: For DUCTILE IRON, see page 17.

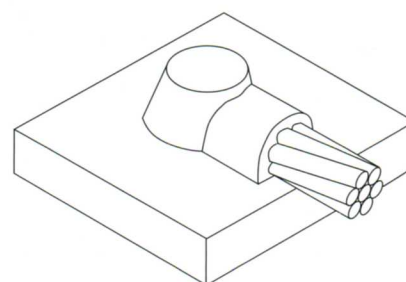
Conductor Size	Surface	Welder Part No. [†]	Welder Price	Weld Metal
#14 to #10 Solid (use sleeve CAB-133-1H)* or #8 Solid or Stranded, or #6 Solid	Flat (4" & larger pipe) 3/4" to 3-1/2" pipe	CAHAA-1G CAHAA-1GA	CAA CAA	CA15 CA15
6 Stranded	Flat (4" & larger pipe) 3/4" to 3-1/2" pipe	CAHAA-1H CAHAA-1HA	CAA CAA	CA15 CA15
4 Solid	Flat (6" & larger pipe) 3/4" to 3-1/2" pipe 4" to 5" pipe	CAHAA-1K CAHAA-1KA CAHAA-1KB	CAA CAA CAA	CA15 CA15 CA15
4 Stranded	Flat (6" & larger pipe) 3/4" to 3-1/2" pipe 4" to 5" pipe	CAHAA-1L CAHAA-1LA CAHAA-1LB	CAA CAA CAA	CA15 CA15 CA15
2 Solid	Flat (10" & larger pipe) 1" to 3-1/2" pipe 4" to 8" pipe	CAHAA-1T CAHAA-1TA CAHAA-1TB	CAA CAA CAA	CA25 CA25 CA25
2 Stranded	Flat (16" & larger pipe) 1" to 3-1/2" pipe 4" to 8" pipe 10" to 14" pipe	CAHAA-1V CAHAA-1VA CAHAA-1VB CAHAA-1VC	CAA CAA CAA CAA	CA32 CA32 CA32 CA32
1 Stranded	Flat (16" & larger pipe) 1-1/2" to 3-1/2" pipe 4" to 8" pipe 10" to 14" pipe	CAHAA-1Y CAHAA-1YA CAHAA-1YB CAHAA-1YC	CAA CAA CAA CAA	CA45 CA45 CA45 CA45
1/0 Stranded	Flat (20" & larger pipe) 2-1/2" to 3-1/2" pipe 4" to 8" pipe 10" to 18" pipe	CAHAA-2C CAHAA-2CA CAHAA-2CB CAHAA-2CC	CAA CAA CAA CAA	CA65 CA65 CA65 CA65
2/0 Stranded	Flat (20" & larger pipe) 2-1/2" to 3-1/2" pipe 4" to 8" pipe 10" to 18" pipe	CAHAA-2G CAHAA-2GA CAHAA-2GB CAHAA-2GC	CAA CAA CAA CAA	CA65 CA65 CA65 CA65

*1 sleeve per connection.

[†] Welder Part No. includes mold frame. If mold only (less frame) is required, order - Welder Part No. - "M".



CAHA - Cable to Horizontal Steel Pipe



CAHA - Cable on surface

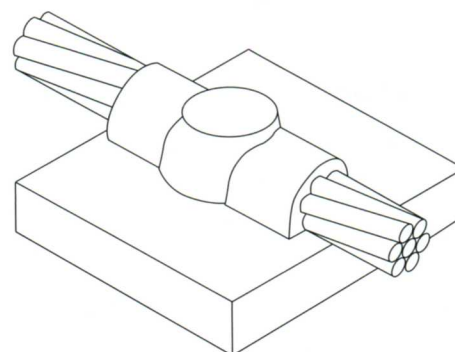
Through conductor to top of horizontal STEEL pipe or flat surface.

NOTE: For DUCTILE IRON, see page 17.

Conductor Size	Surface	Welder Part No.†	Welder Price	Weld Metal
#14 to #10 Solid (use sleeve CAB-133-1H)* or #8 Solid or Stranded, or #6 Solid	Flat (12" & larger pipe)	CAHCA-1G	CAA	CA25
	3/4" to 2" pipe	CAHCA-1GA	CAA	CA25
	2-1/2" to 5" pipe	CAHCA-1GB	CAA	CA25
	6" to 10" pipe	CAHCA-1GC	CAA	CA25
6 Stranded	Flat (12" & larger pipe)	CAHCA-1H	CAA	CA25
	3/4" to 2" pipe	CAHCA-1HA	CAA	CA25
	2-1/2" to 5" pipe	CAHCA-1HB	CAA	CA25
	6" to 10" pipe	CAHCA-1HC	CAA	CA25
4 Solid	Flat (12" & larger pipe)	CAHCA-1K	CAA	CA25
	3/4" to 2" pipe	CAHCA-1KA	CAA	CA25
	2-1/2" to 5" pipe	CAHCA-1KB	CAA	CA25
	6" to 10" pipe	CAHCA-1KC	CAA	CA25
4 Stranded	Flat (12" & larger pipe)	CAHCA-1L	CAA	CA25
	3/4" to 2" pipe	CAHCA-1LA	CAA	CA25
	2-1/2" to 5" pipe	CAHCA-1LB	CAA	CA25
	6" to 10" pipe	CAHCA-1LC	CAA	CA25
2 Solid	Flat (14" & larger pipe)	CAHCA-1T	CAA	CA32
	2" to 3-1/2" pipe	CAHCA-1TA	CAA	CA32
	4" to 6" pipe	CAHCA-1TB	CAA	CA32
	8" to 10" pipe	CAHCA-1TC	CAA	CA32
2 Stranded	Flat (18" & larger pipe)	CAHCA-1V	CAA	CA45
	2" to 3-1/2" pipe	CAHCA-1VA	CAA	CA45
	4" to 8" pipe	CAHCA-1VB	CAA	CA45
	10" to 16" pipe	CAHCA-1VC	CAA	CA45
1 Stranded	Flat (18" & larger pipe)	CAHCA-1Y	CAA	CA45
	2" to 3-1/2" pipe	CAHCA-1YA	CAA	CA45
	4" to 8" pipe	CAHCA-1YB	CAA	CA45
	10" to 16" pipe	CAHCA-1YC	CAA	CA45
1/0 Stranded	Flat (30" & larger pipe)	CAHCA-2C	CAA	CA65
	3" to 4" pipe	CAHCA-2CA	CAA	CA65
	5" to 6" pipe	CAHCA-2CB	CAA	CA65
	8" to 10" pipe	CAHCA-2CC	CAA	CA65
	12" to 28" pipe	CAHCA-2CD	CAA	CA65
2/0 Stranded	Flat (30" & larger pipe)	CAHCA-2G	CAA	CA65
	3" to 4" pipe	CAHCA-2GA	CAA	CA65
	5" to 6" pipe	CAHCA-2GB	CAA	CA65
	8" to 10" pipe	CAHCA-2GC	CAA	CA65
	12" to 28" pipe	CAHCA-2GD	CAA	CA65

* 2 sleeves per connection.

† Welder Part No. includes mold frame. If mold only (less frame) is required, order - Welder Part No. - "M".



CAHC – Cable on surface

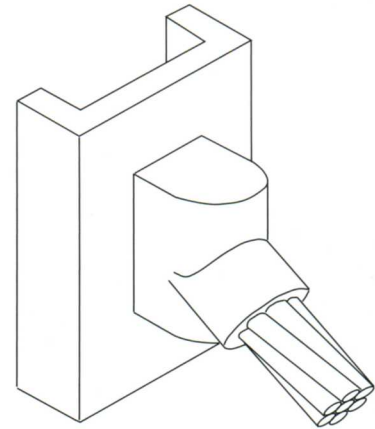
Tap conductor to vertical STEEL pipe or flat surface.

NOTE: For DUCTILE IRON, see page 17.

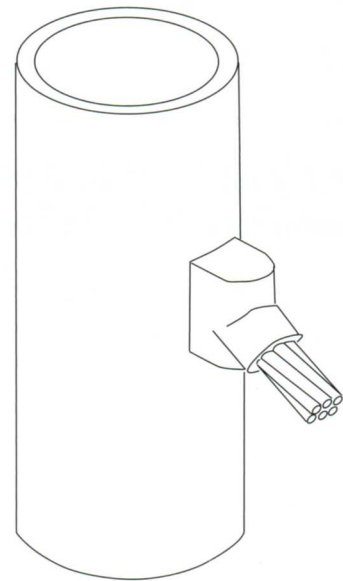
Conductor Size	Surface	Welder Part No. [†]	Welder Price	Weld Metal
#14 to #10 Solid (use sleeve CAB-133-1H)* or #8 Solid or Stranded, or #6 Solid	Flat (12" & larger pipe)	CAVST-1G	CAT	CA15
	3/4" to 3-1/2" pipe	CAVST-1GA	CAT	CA15
	4" to 10" pipe	CAVST-1GB	CAT	CA15
6 Stranded	Flat (12" & larger pipe)	CAVST-1H	CAT	CA15
	3/4" to 3-1/2" pipe	CAVST-1HA	CAT	CA15
	4" to 10" pipe	CAVST-1HB	CAT	CA15
4 Solid	Flat (12" & larger pipe)	CAVST-1K	CAT	CA25
	3/4" to 1-1/2" pipe	CAVST-1KA	CAT	CA25
	2" to 4" pipe	CAVST-1KB	CAT	CA25
	5" to 10" pipe	CAVST-1KC	CAT	CA25
4 Stranded	Flat (12" & larger pipe)	CAVST-1L	CAT	CA25
	3/4" to 1-1/2" pipe	CAVST-1LA	CAT	CA25
	2" to 4" pipe	CAVST-1LB	CAT	CA25
	5" to 10" pipe	CAVST-1LC	CAT	CA25
2 Solid	Flat (14" & larger pipe)	CAVST-1T	CAT	CA25
	1" to 1-1/2" pipe	CAVST-1TA	CAT	CA25
	2" to 4" pipe	CAVST-1TB	CAT	CA25
	5" to 12" pipe	CAVST-1TC	CAT	CA25
2 Stranded	Flat (14" & larger pipe)	CAVST-1V	CAT	CA32
	1" to 1-1/2" pipe	CAVST-1VA	CAT	CA32
	2" to 3" pipe	CAVST-1VB	CAT	CA32
	4" to 6" pipe	CAVST-1VC	CAT	CA32
	8" to 12" pipe	CAVST-1VD	CAT	CA32
1 Stranded	Flat (18" & larger pipe)	CAVSP-1Y	CAP	CA45
	1-1/2" to 2-1/2" pipe	CAVSP-1YA	CAP	CA45
	3" to 4" pipe	CAVSP-1YB	CAP	CA45
	5" to 10" pipe	CAVSP-1YC	CAP	CA45
	12" to 16" pipe	CAVSP-1YD	CAP	CA45
1/0 Stranded	Flat (18" & larger pipe)	CAVSP-2C	CAP	CA65
	2-1/2" to 4" pipe	CAVSP-2CA	CAP	CA65
	5" to 10" pipe	CAVSP-2CB	CAP	CA65
	12" to 16" pipe	CAVSP-2CC	CAP	CA65
2/0 Stranded	Flat (18" & larger pipe)	CAVSP-2G	CAP	CA65
	3" to 4" pipe	CAVSP-2GA	CAP	CA65
	5" to 10" pipe	CAVSP-2GB	CAP	CA65
	12" to 16" pipe	CAVSP-2GC	CAP	CA65

* 1 sleeve per connection.

† Welder Part No. includes mold frame. If mold only (less frame) is required, order - Welder Part No. - "M".



CAVS

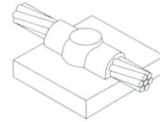


CAVS – Cable on surface

Connections to Cast Iron

Type CAHB & CAHE

Type CAHB Tap conductor to top of horizontal CAST IRON pipe or flat surface.



Type CAHE Through conductor to top of horizontal CAST IRON pipe or flat surface.

TYPE CAHB			Conductor Size	Surface	TYPE CAHE		
Welder Part No. †	Welder Price	Weld Metal			Welder Part No. †	Welder Price	Weld Metal
CAHBA-1G CAHBA-1G-P.S.*	CAA CAA	CA25XF-19 CA25XF-19	#14 to #10 Solid (use sleeve CAB-133-1H)** or #8 Solid or Stranded, or #6 Solid	Flat (30" & larger pipe) 4" to 24" pipe	CAHEA-1G CAHEA-1G-P.S.*	CAA CAA	CA32XF-19 CA32XF-19
CAHBA-1H CAHBA-1H-P.S.*	CAA CAA	CA25XF-19 CA25XF-19	6 Stranded	Flat (30" & larger pipe) 4" to 24" pipe	CAHEA-1H CAHEA-1H-P.S.*	CAA CAA	CA32XF-19 CA32XF-19
CAHBA-1K CAHBA-1K-P.S.*	CAA CAA	CA45XF-19 CA45XF-19	4 Solid	Flat (30" & larger pipe) 4" to 24" pipe	CAHEA-1K CAHEA-1K-P.S.*	CAA CAA	CA45XF-19 CA45XF-19
CAHBA-1L CAHBA-1L-P.S.*	CAA CAA	CA45XF-19 CA45XF-19	4 Stranded	Flat (30" & larger pipe) 4" to 24" pipe	CAHEA-1L CAHEA-1L-P.S.*	CAA CAA	CA45XF-19 CA45XF-19
CAHBA-1T CAHBA-1T-P.S.*	CAA CAA	CA45XF-19 CA45XF-19	2 Solid	Flat (30" & larger pipe) 4" to 24" pipe	CAHEA-1T CAHEA-1T-P.S.*	CAA CAA	CA45XF-19 CA45XF-19
CAHBA-1V CAHBA-1V-P.S.*	CAA CAA	CA45XF-19 CA45XF-19	2 Stranded	Flat (30" & larger pipe) 4" to 24" pipe	CAHEA-1V CAHEA-1V-P.S.*	CAA CAA	CA45XF-19 CA45XF-19
CAHBA-1Y CAHBA-1Y-P.S.*	CAA CAA	CA65XF-19 CA65XF-19	1 Stranded	Flat (30" & larger pipe) 4" to 24" pipe	CAHEA-1Y CAHEA-1Y-P.S.*	CAA CAA	CA65XF-19 CA65XF-19

* Specify pipe size. Example: For #2 stranded to 6" pipe. (Type CAHB) CAHBA-1V-6, (Type CAHE) CAHEA-1V-6.

** 1 Sleeve per connection for Type CAHB. 2 Sleeves per connection for Type CAHE.

† Welder Part No. includes mold frame. If mold only (less frame) is required, order - Welder Part No. - "M".

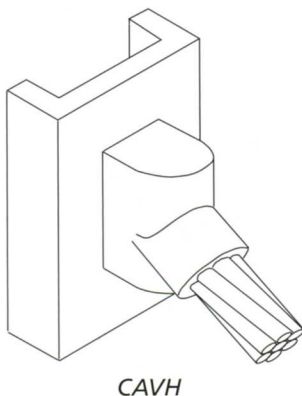
Do not use Types CAHB, CAHE, or CAVH on soil pipe (ASTM A74-82)

A test weld should be made on a section of the pipe being used to determine possibility of detrimental metallurgical effects. For DUCTILE IRON, see page 17.

Connections to Cast Iron

Type CAVH

Type CAVH Tap conductor to vertical CAST IRON pipe or flat surface.



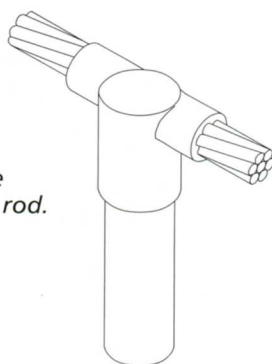
Conductor Size	Surface	Welder Part No. †	Weld Price	Weld Metal
#14 to #10 Solid (use sleeve CAB-133-1H)** or #8 Solid or Stranded, or #6 Solid	Flat (30" & larger pipe) 4" to 24" pipe	CAVHT-1G CAVHT-1G-P.S.*	CAT CAT	CA25XF-19 CA25XF-19
6 Stranded	Flat (30" & larger pipe) 4" to 24" pipe	CAVHT-1H CAVHT-1H-P.S.*	CAT CAT	CA25XF-19 CA25XF-19
4 Solid	Flat (30" & larger pipe) 4" to 24" pipe	CAVHT-1K CAVHT-1K-P.S.*	CAT CAT	CA32XF-19 CA32XF-19
4 Stranded	Flat (30" & larger pipe) 4" to 24" pipe	CAVHT-1L CAVHT-1L-P.S.*	CAT CAT	CA32XF-19 CA32XF-19
2 Solid	Flat (30" & larger pipe) 4" to 24" pipe	CAVHP-1T CAVHP-1T-P.S.*	CAP CAP	CA45XF-19 CA45XF-19
2 Stranded	Flat (30" & larger pipe) 4" to 24" pipe	CAVHP-1V CAVHP-1V-P.S.*	CAP CAP	CA45XF-19 CA45XF-19
1 Stranded	Flat (36" & larger pipe) 4" to 30" pipe	CAVHP-1Y CAVHP-1Y-P.S.*	CAP CAP	CA65XF-19 CA65XF-19

* Specify pipe size. Example: For #2 stranded to 6" pipe, CAVHP-1V-6.

** 1 sleeve per connection.

† Welder Part No. includes mold frame. If mold only (less frame) is required, order - Welder Part No. - "M".

Style CAGR Tap
conductor to the
top of a ground rod.



Style CAGT
Through conductor to the top
of a ground rod.



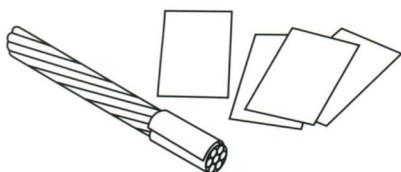
Ground Rod Size ¹	Conductor Size	STYLE GR			STYLE GT		
		Welder Part No. [†]	Welder Price	Weld Metal	Welder Part No. [†]	Welder Price	Weld Metal
Nominal 1/2" (Actual .475 Dia.)	#14 to #10 Solid (use sleeve CAB-133-1H)* or #8 Solid or Stranded, or #6 Solid	CAGRT-151G	CAT	CA25	CAGTT-151G	CAT	CA32
	6 Stranded	CAGRT-151H	CAT	CA25	CAGTT-151H	CAT	CA32
	4 Solid	CAGRT-151K	CAT	CA25	CAGTT-151K	CAT	CA32
	4 Stranded	CAGRT-151L	CAT	CA25	CAGTT-151L	CAT	CA32
	2 Solid	CAGRT-151T	CAT	CA32	CAGTP-151T	CAP	CA45
	2 Stranded	CAGRT-151V	CAT	CA32	CAGTP-151V	CAP	CA45
	1 Stranded	CAGRP-151Y	CAP	CA45	CAGTP-151Y	CAP	CA65
	1/0 Stranded	CAGRP-152C	CAP	CA65	CAGTP-152C	CAP	CA65
	2/0 Stranded	CAGRP-152G	CAP	CA65	CAGTP-152G	CAP	CA65
Nominal 5/8" (Actual .563 Dia.)	#14 to #10 Solid (use sleeve CAB-133-1H)* or #8 Solid or Stranded, or #6 Solid	CAGRT-161G	CAT	CA32	CAGTP-161G	CAP	CA45
	6 Stranded	CAGRT-161H	CAT	CA32	CAGTP-161H	CAP	CA45
	4 Solid	CAGRT-161K	CAT	CA32	CAGTP-161K	CAP	CA65
	4 Stranded	CAGRT-161L	CAT	CA32	CAGTP-161L	CAP	CA65
	2 Solid	CAGRP-161T	CAP	CA45	CAGTP-161T	CAP	CA65
	2 Stranded	CAGRP-161V	CAP	CA45	CAGTP-161V	CAP	CA65
	1 Stranded	CAGRP-161Y	CAP	CA45	CAGTP-161Y	CAP	CA65
	1/0 Stranded	CAGRP-162C	CAP	CA65	CAGTN-162C	CAN	2-CA45
	2/0 Stranded	CAGRP-162G	CAP	CA65	CAGTN-162G	CAN	2-CA45
Nominal 3/4" (Actual .682 Dia.)	#14 to #10 Solid (use sleeve CAB-133-1H)* or #8 Solid or Stranded, or #6 Solid	CAGRT-181G	CAT	CA32	CAGTP-181G	CAP	CA45
	6 Stranded	CAGRT-181H	CAT	CA32	CAGTP-181H	CAP	CA45
	4 Solid	CAGRP-181K	CAP	CA45	CAGTP-181K	CAP	CA65
	4 Stranded	CAGRP-181L	CAP	CA45	CAGTP-181L	CAP	CA65
	2 Solid	CAGRP-181T	CAP	CA45	CAGTP-181T	CAP	CA65
	2 Stranded	CAGRP-181V	CAP	CA45	CAGTP-181V	CAP	CA65
	1 Stranded	CAGRP-181Y	CAP	CA45	CAGTP-181Y	CAP	CA65
	1/0 Stranded	CAGRP-182C	CAP	CA65	CAGTN-182C	CAN	2-CA45
	2/0 Stranded	CAGRP-182G	CAP	CA65	CAGTN-182G	CAN	2-CA45

¹ For plain (unthreaded) copper-clad ground rods only. For threaded copper-clad rods or for steel rods, contact ERICO for part number.

[†] Welder Part No. includes mold frame. If mold only (less frame) is required, order - Welder Part No. - "M".

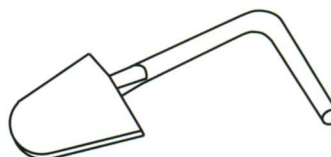
* 1 sleeve per GR connection. 2 sleeves per GT connection.

Tools and Materials



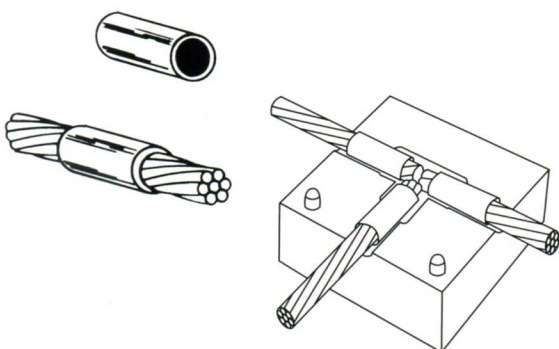
CADWELD WRAP SLEEVE CAB140A

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



MOLD CLEANER CAB-136-A

Mold Cleaners are useful for removing the slag from CAA molds after making a CADWELD connection.

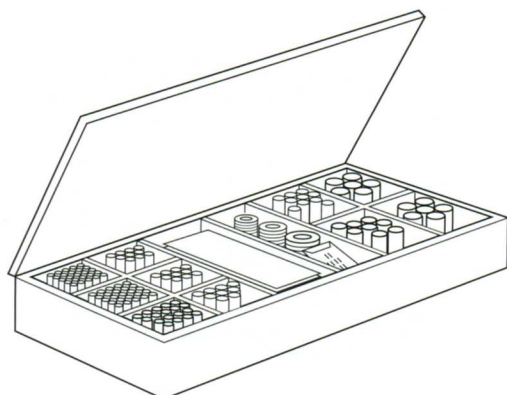


ADAPTER SLEEVES

Small conductors may be built up to fit the opening of larger size welders using either adapter sleeves or shim stock.

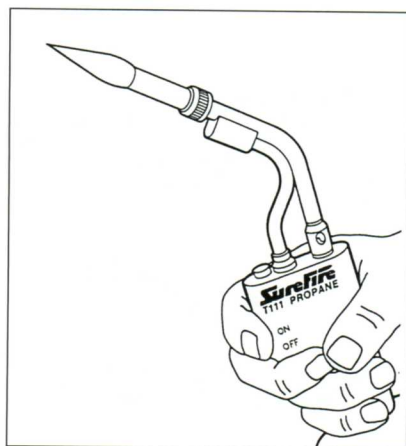
Cable Size		Use Adapter Sleeve Part No.	Use in Mold for Conductor Size	
Stranded	Solid		Stranded	Solid
#12, 14	#10, 12, 14	CAB-133-1H	#6	#6
10	8, 10	CAB-133-1K	--	4
7, 8, 10	6, 8	CAB-133-1L	4	--
6	5	CAB-112	2	--

Adapter sleeves can be used when a limited number of connections are to be made with a smaller conductor in a larger welder.



CADWELD Sleeve Kit

T427 Includes:			
Product#	Quantity	Product#	Quantity
B1331H	25	B1332L	8
B1331L	25	B1332Q	12
B112	18	B140A	10
B1331V	10	B117A	20
B1331Y	10	B117B	10
B1332C	9	B117C	10
B1332G	10	T320A	10



SUREFIRE™ CAT-111

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

SUREFIRE™ is a trademark of IPI.

CADWELD Connections and Pipe Wall Thickness

The following is a discussion of the minimum pipe size required for safe installation of CADWELD Cathodic Connections considering of the service conditions and without special factory testing. Several things must be considered as outlined below.

For a particular wall thickness:

- a. The hoop stress in the pipe will increase as the pipe diameter increases.
- b. The heat dissipation will be affected by the thermal characteristics of the material in the pipe.
- c. The heat dissipation will be affected by the rate of flow of the material through the pipe while making the weld.
- d. The pipe strength will be affected by the temperature of the pipe (material temperature).
- e. Any internal coating of the pipe must be checked to find if the temperature of the pipe directly under the weld will adversely affect it.

Based on a minimum wall thickness of 0.109 inches* (2.769 mm) and using a CA15 Weld Metal (the maximum allowed to oil or gas piping systems per ANSI/ASME B31.4 and B31.8), the minimum recommended pipe size and schedule is:

<u>Nominal Pipe Size</u>	<u>Schedule</u>	<u>Wall Thickness</u>
1/2 "	40	0.109
3/4 "	40	0.113
1 to 2 "	10	.0109
2-1/2 to 4 "	10	1.120
5 to 8 "	5	0.109
10" and larger	5	>0.109

Tests made by operating gas companies indicate no damage to a 4" Grade 52 pipe having a 0.109" wall when making a weld to the pipe at 500 psig using a CA15. Welds made to a steel plate 0.109" thick had a maximum copper penetration depth of less than 0.010". Other tests on tubes with a 0.125" or 0.150" wall showed a copper penetration of 0.005' maximum.

Ductile Iron

Tests by ERICO, Inc. indicate that connections to DUCTILE IRON pipe can be made using the CADWELD molds and weld metal designated to be used on steel pipe.

However, some reports from the field suggest that all ductile iron is not the same. In some cases the material for steel will not work. In such cases, the molds and weld material for cast iron do work.

We therefore, suggest:

1. Whenever possible, make tests on the ductile iron pipe being used to determine if the material for steel can be used.

-OR-

2. Use the material for cast iron. It will make satisfactory connections on all ductile iron.