



CATHODIC
PROTECTION
CO LTD

Thermite Weld Equipment

APPLICATION

On-shore, marine and concrete structures

THERMITE WELD DATA

Thermite welding is a simple, inexpensive and efficient method of attaching a copper conductor cable to steel or cast iron.

It is particularly useful for connecting cathodic protection cables to pipelines including test leads, negative and bonding cables. The welding process uses a high temperature reaction charge of powdered copper oxide and aluminium which when ignited produces aluminium oxide and super heated copper.



Thermite Weld Equipment

The thermOweld Process

The thermOweld® cathodic connection process is a simple, efficient method of welding copper to copper or copper to steel. One advantage is that NO outside power is required when using the thermOweld® exothermic process. The thermOweld® process uses high temperature reaction of powdered copper oxide and aluminum, the reaction takes place in a semi-permanent graphite mold. These molds should last for approximately fifty or more welds if proper care is given. The reaction takes place very rapidly, therefore the total amount of heat applied to the conductors or surfaces is considerably less than that of brazing or soldering. This is important to remember when welding to insulated cable or thin wall pipe.

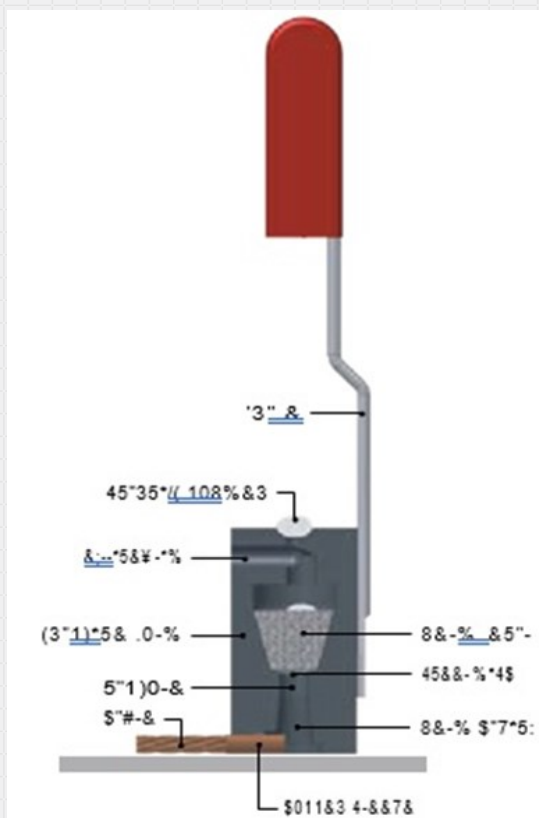
This system is very field friendly, since it is light and portable and requires no outside power source. It requires very little time or skill to obtain an efficient, maintenance free connection when using the thermOweld® process.

For more information visit our website @ www.thermOweld.com

The thermOweld® process has been used to weld materials other than copper for electrical purposes. Materials welded include:

Stainless Steel	Columbium	Brass
Copperweld®	Plain Steel	Bronze
Nichrome V	Everdur®	Niobium
Galvanized Steel	Kama	Chromax
Silicon Bronze	Steel Rail	Cast Iron
Copper Clad Steel	Cor-ten®	Monel

When welding to galvanized steel it is recommended to resurface exposed bare steel.



The thermOweld® connection is a molecular weld. The weld has the same melting point as copper. This factor along with the increased cross sectional area of the connection and the following insure:

- thermOweld® connections will not be affected by a high current surge. Tests have shown that the electrical conductor will melt before the thermOweld® connection, when subjected to high short circuit current. Consult IEEE Standard 837.
- thermOweld® connections will not loosen or corrode at the point of weld. There are no contact surfaces or mechanical pressures involved.
- A thermOweld® connection becomes an integral part of the conductor. thermOweld® connections have a current-carrying capacity equal to or greater than that of the conductors.



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WELD METAL

thermOweld® Weld Metal is packaged in moisture-resistant plastic cartridges that have tight fitting caps. These cartridges and the necessary steel discs are then packaged in boxes that are shrink-wrapped. This insures the weld metal arriving in good condition, always dry, and ready for a positive ignition every time.

thermOweld® Weld Metal comes in four types; one for welding copper to copper or copper to steel, copper to rail, copper to cast iron and one for welding copper to steel for cathodic protection. The size and weight (in grams) of the cartridge are marked on each individual cartridge. thermOweld® Weld Metal is available to be shipped via ground, air or ocean freight.



Standard Cartridge Size	Cast Iron Cartridge Size	Cathodic Protection Cartridge Size	Rail Cartridge Size	Packed Per Box
#15	#15CI	#15CP	#15R	20
#25	#25CI	#25CP	#25R	20
#32	#32CI	#32CP	#32R	10
#45	#45CI	#45CP	#45R	20
#65	#65CI	#65CP	#65R	20
#90	#90CI	~	#90R	10
#115	#115CI	~	#115R	10
#150	~	~	#150R	10
#200	~	~	#200R	10
#250	~	~	#250R	10
#500	~	~	#500R	10

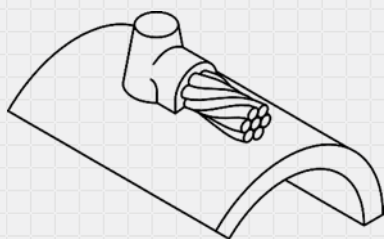
thermOweld® weld metal is sold in box quantities only

Thermite Weld Equipment

CS-32

CS-32 TYPE MOLDS Horizontal Cable to Horizontal Steel Surface

CS-32 type molds are for connecting copper cable to horizontal steel surfaces. When welding to steel pipe, each mold fits a wide range of pipe sizes. When welding to pipe, the cable runs parallel to the pipe. For welding to ductile iron pipe, see note below.



Each Cathodic Pack Contains

Flat to 4" & larger Pipe	3/4" to 3 1/2" & larger pipe
(1) M-100 mold	(1) M-101 mold
(80) 15PS cartridges	(80) 15PS cartridges
(80) sleeves	(80) sleeves
Flint gun	Flint gun
Mold cleaner	Mold cleaner
Part #	Part #
38-4350-00	38-4351-00

Cable Size	Surface	Mold #	Price Key	Weld Metal
#6 Sol†	Flat (4" & larger pipe)	M-100	2	15CP
	3/4" to 3 1/2" pipe	M-101	3	15CP
#6 Str	Flat (4" & larger pipe)	M-102	2	15CP
	3/4" to 3 1/2" pipe	M-103	3	15CP
#4 Sol	Flat (6" & larger pipe)	M-104	2	15CP
	3/4" to 3 1/2" pipe	M-105	3	15CP
	4" to 5" pipe	M-130	3	15CP
#4 Str	Flat (6" & larger pipe)	M-106	2	15CP
	3/4" to 3 1/2" pipe	M-107	3	15CP
	4" to 5" pipe	M-108	3	15CP
#2 Sol	Flat (10" & larger pipe)	M-109	3	25CP
	1" to 3 1/2" pipe	M-110	3	25CP
	4" to 8" pipe	M-111	3	25CP
#2 Str	Flat (10" & larger pipe)	M-112	3	32CP
	1" to 3 1/2" pipe	M-113	3	32CP
	4" to 8" pipe	M-114	3	32CP
	10" to 14" pipe	M-115	3	32CP
#1 Str	Flat (16" & larger pipe)	M-116	3	45CP
	1 1/2" to 3 1/2" pipe	M-117	3	45CP
	4" to 8" pipe	M-118	3	45CP
	10" to 14" pipe	M-119	3	45CP
1/0 Str	Flat (20" & larger pipe)	M-120	3	65CP
	2 1/2" to 3 1/2" pipe	M-121	3	65CP
	4" to 8" pipe	M-122	3	65CP
	10" to 18" pipe	M-123	3	65CP
2/0 Str	Flat (20" & larger pipe)	M-124	3	65CP
	2 1/2" to 3 1/2" pipe	M-125	3	65CP
	4" to 8" pipe	M-126	3	65CP
	10" to 18" pipe	M-127	3	65CP

Thermite Weld Equipment

CS-32

CS-32 TYPE MOLDS

Horizontal Cable to Horizontal Steel Surface

CS-32 type molds are for connecting copper cable to horizontal steel surfaces. When welding to steel pipe, each mold fits a wide range of pipe sizes. When welding to pipe, the cable runs parallel to the pipe. For welding to ductile iron pipe, see note below.

CABLE SIZE	SURFACE	MOLD#	PRICE KEY	WELD METAL
#6 Sol‡	Flat (30" & larger pipe)	M-156	3	25CI
#6 Str	Flat (30" & larger pipe)	M-157	3	25CI
#4 Sol	Flat (30" & larger pipe)	M-158	3	45CI
#4 Str	Flat (30" & larger pipe)	M-159	3	45CI
#2 Sol	Flat (30" & larger pipe)	M-160	3	45CI
#2 Str	Flat (30" & larger pipe)	M-161	3	45CI
#1 Str	Flat (30" & larger pipe)	M-163	3	65CI

CS-35

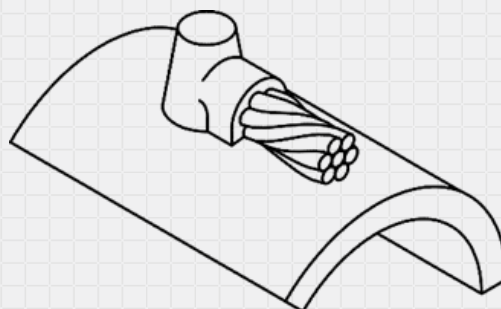
CS-35 TYPE MOLDS

Horizontal Thru Cable to Horizontal Cast Iron Surface

CS-35 type Molds are for connecting copper cable to horizontal cast iron surfaces. When welding to cast iron pipe, each mold fits a specific pipe size. When welding to pipe, the cable runs parallel to the pipe. For welding to ductile iron pipe, see note below.

CABLE SIZE	SURFACE	MOLD#	PRICE KEY	WELD METAL
#6 Sol‡	Flat (30" & larger pipe)	M-5316	3	32CI
#6 Str	Flat (30" & larger pipe)	M-5535	3	32CI
#4 Sol	Flat (30" & larger pipe)	M-5536	3	45CI
#4 Str	Flat (30" & larger pipe)	M-5537	3	45CI
#2 Sol	Flat (30" & larger pipe)	M-5538	3	45CI
#2 Str	Flat (30" & larger pipe)	M-5540	3	45CI
#1 Str	Flat (30" & larger pipe)	M-5542	3	65CI

DO NOT use Type CS-33 or CS-35 molds on Soil Pipe (ASTM A74-82). A test weld should be made on a section of the pipe being used to determine the possibility of detrimental metallurgical effects.



For sizes not listed, contact thermOweld®

Sold complete with frame. If not required, specify MOLD NUMBER followed by suffix "-G".

‡ For wire size #14 to #10 solid, order (1) 38-0200-00 sleeve per weld.

Welding To Horizontal Pipe: to weld to 4" to 24" horizontal pipe, add pipe size to mold number. to weld #1 str cable to 6" horizontal pipe, the mold number would be M-163-6. to weld to pipe 30" and larger, use flat surface mold.

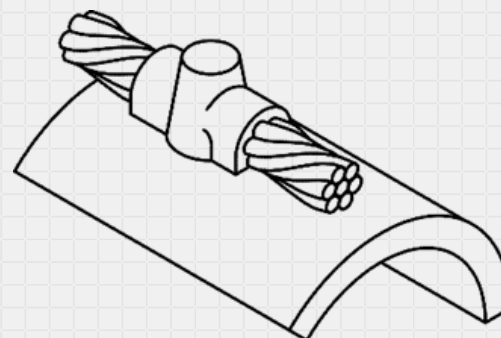
Required tools;

38-0309-00 ~ Flint Ignitor

Other recommended accessories;

38-3922-00 ~ Mold Cleaning Brush (pg 18) 38-0135-00 ~ Cable Cleaning Brush (pg 18) 38-0101-00 ~ Rasp (pg 19)

Welding To Ductile Iron Pipe: When welding to ductile iron pipe, use weld metal and molds designated for cast iron



For sizes not listed, contact thermOweld®

Sold complete with frame. If not required, specify MOLD NUMBER followed by suffix "-G".

‡ For wire size #14 to #10 solid, order (2) 38-0200-00 sleeves per weld.

Welding To Horizontal Pipe: to weld to 4" to 24" horizontal pipe, add pipe size to mold number. to weld #1 str cable to 6" horizontal pipe, the mold number would be M-5542-6. To weld to pipe 30" and larger, use flat surface mold.

Required tools;

38-0309-00 ~ Flint Ignitor

Other recommended accessories;

38-3922-00 ~ Mold Cleaning Brush

38-0135-00 ~ Cable Cleaning Brush

38-0101-00 ~ Rasp

Welding To Ductile Iron Pipe: When welding to ductile iron pipe, use weld metal and molds designated for cast iron.