

TECHNICAL INFORMATION

The thermOweld® Process

The thermOweld® permanent-connection process has been engineered to be an easy and efficient field welding system. No outside power, bulky gas tanks or other equipment associated with welding are required with the thermOweld® system. Any field installer or contractor can use our high-grade graphite molds designed and produced in thermOweld's world-class volume CNC manufacturing operations.

Incorporating our EZ Lite® mold lid (see page 10), ignition is done safely from the top of the mold with limited exhaust emanating from the side vent. This innovation from thermOweld®, combined with other unique features, make even tight field installations possible. For indoor connections where desired, thermOweld® offers low-emissions molds as well. Contractors worldwide demand thermOweld® for ease of use and the safest operation.

Using thermOweld's superior weld metal (see page 132), a high-temperature reaction between special formulations of copper oxide and aluminum occurs in the mold crucible. Upon reaching critical temperature, the resulting molten copper drops into the weld cavity, instantly creating a high-temperature molecular bond with the conductor. This weld connection cools rapidly and the mold can be removed for the next connection with thermOweld's special off-set handle clamps (page 136). The thermOweld® process creates a superior connection without the excessive applied heat of brazing, arc welding or soldering. This is important especially for welding insulated cables or to thin-wall pipe.

The thermOweld® process creates a permanent, homogenous and molecular bond that cannot loosen or corrode. Compared to compression connectors, split bolts, crimp connectors, brazing and other connections, the thermOweld® connection is clearly superior. In fact, a thermOweld® connection will also withstand more current than the conductor itself.

It's easy to see why thermOweld® is The Contractor's Choice worldwide!

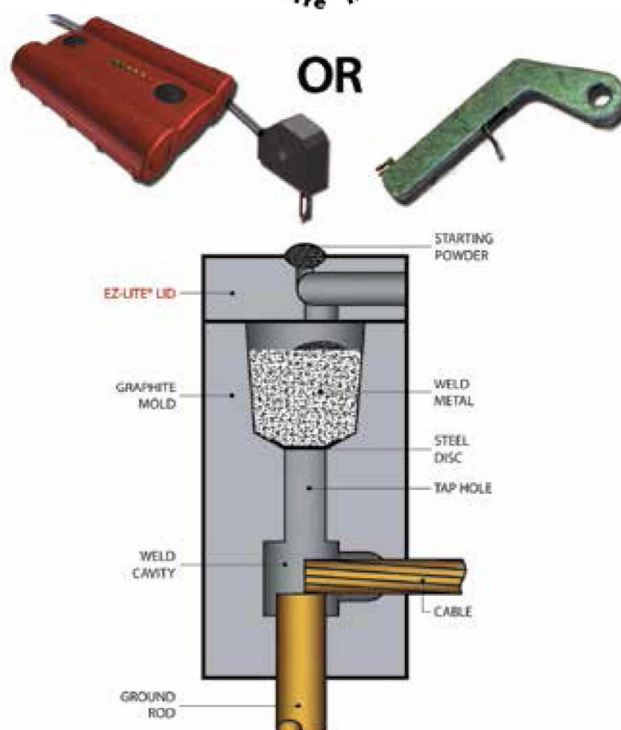
The thermOweld® process has been used to weld materials other than copper for electrical purposes, including:

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

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



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Standards Relating to thermOweld Designs of Earthing, Grounding and Lightning Protection

Standards	Country	Description
IEEE: 80-1986	USA, Australia, Asia, Europe, Latin America	Guide for Safety in AC Substation Grounding
IEEE: 837	USA, Australia, Asia, Latin America	Standard for Qualifying Permanent Connections used in Substation Grounding
IEEE: 81-1983	USA, Australia, Asia	Guide for Measuring Earth Resistivity, Ground Impedance and Earth Surface Potential of a Ground System
IEEE: 998-1996	USA, Australia, Asia	Guide for Direct Lightning Strike Shielding of Substations
UL-96	USA	Lightning Protection Components
UL 467	USA, Australia, Asia	Grounding and Bonding Equipment
NFPA 780	USA, Australia, Asia	Lightning Protection
NEC-250	USA, Canada	Grounding and Bonding National Electrical Code
TIA-607-B -2	Global	Telecom Grounding Bars and Products
IEC/TS 60479-1	Europe, Brazil	Effects of Current passing through human beings & livestock
EN62305-3: 2011	Europe	Protection against Lightning, Physical damage to structure and life hazard
ANCE NMX-J-549-2005	Latin America	Lightning Protection

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EMPIRE

thermOweld® EXOTHERMIC MOLDS

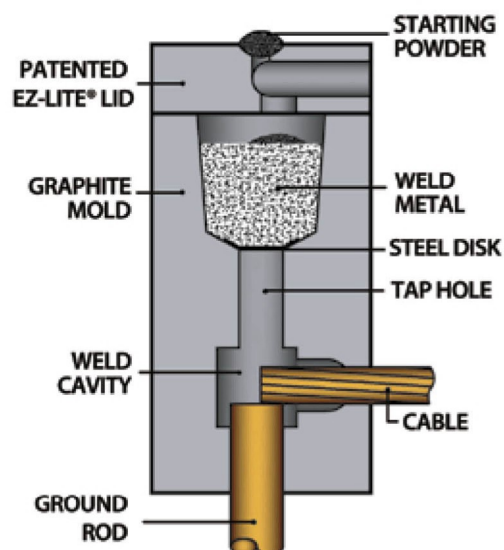
thermOweld® is a process of welding copper to copper, copper to steel and copper to ductile iron. The exothermic reaction takes place in a semi-permanent graphite mold with a special formula of copper oxide and aluminum.

thermOweld® connections are solid copper molecular bonds that do not loosen or corrode throughout the life of the host structure. These bonds are the superior connection method for the most reliable and highest longevity of grounding, lightning protection, cathodic protection and other critical infrastructure systems.

Standard Molds – thermOweld® standard molds are given in the tables on the pages in this catalog and are used with new clean AWG and Metric wire and cable. A standard mold is not for use in “heavy-duty” applications; see Heavy Duty Molds.

Heavy Duty Molds – thermOweld® heavy-duty molds are given in the tables on the pages in this catalog (with an H suffix) and are employed for use with reused or reclaimed and heavily oxidized AWG and Metric wire and cable. In these cases a “heavy-duty” mold is recommended as it accepts this larger wire diameter and utilizes a larger weld metal cartridge size. The resulting connection is larger than a standard mold connection. Note that the grounding engineer may determine that the calculated theoretical ground fault current level may be abnormally high and therefore would prefer the larger mass of a heavy-duty mold connection.

thermOweld® has designed and produced over 15,000 unique molds to meet application needs worldwide. We have solved many applications with unique and customized molds, utilizing our CAD engineering and specialized CNC machining capabilities. If you don't see what you need in this comprehensive catalog, contact us. We are ready to support you quickly!



SINGLE SHOTS

thermOweld® single shot molds are an economical way to make cable connections onto the top of a ground rod or rebar. The single shot is a disposable single use ceramic mold that comes complete with everything required except the flint ignitor. This innovative process eliminates the need for a mold, handle clamps, and frames.



SUPERIOR 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. Shrink wrapping ensures the weld metal will arrive in good condition, always dry, and ready for a positive ignition every time.

All weld metal is eligible for thermOweld's SDS (Same Day Service) shipment. Our SDS program is just like having it on your shelf.



The Molecular Bond

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 insure the following:

- thermOweld® connections are not 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.
- thermOweld® connections have a current-carrying capacity equal to or greater than that of the conductors.

The EZ Lite® Mold

- Makes all thermOweld® molds EZ to ignite.
- Lights from the top at any angle.
- Reduces emissions by 50% or more.
- Reduces splatter.
- Keeps the handle clamps clean and prolongs life.
- Added Safety - The EZ Lite® Lid points the exhaust away from the user.



INSTALLATION IS EASY!

Making a thermOweld® Connection



1
Position cleaned conductors in mold.



2
Place metal disc in bottom of mold crucible.



3
Pour powder into crucible.



4
Place a small amount of starting powder in the ignition pocket.



5
Ignite the starting powder with the Flint Ignitor.



6
Remove weld and clean mold before making next connection.

Visit www.thermOweld.com for training videos

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INSTALLATION IS EASY!

Making a thermOweld® Connection using the EZ Lite Remote® Electric Start System



1
Position cleaned conductors in mold.



2
Place metal disc in bottom of mold crucible.



3
Pour powder into crucible.



4
Insert the EZ Lite® Ignitor in the connector.



5
Insert the EZ Lite® Ignitor in the top opening of the EZ Lite® Lid.



6
Turn the power button to the "ON" position.



7
Press the "Operate" button until the exothermic reaction is initiated.



8
Remove weld and clean mold before making next connection.

thermOweld's EZ Lite Remote® is the latest technological advance for thermOweld® exothermic products and the entire industry! For over 50 years, thermOweld® has been developing and inventing products and practical solutions that have become "The Contractor's Choice" worldwide.

With our patent-pending EZ Lite Remote®, the contractor, installer and distributor has versatility and ease-of-use in hand.

You can use your existing thermOweld® EZ Lite® molds and weld metal that you already have in your truck, the jobsite or on your shelf!

Visit www.thermOweld.com for training videos or scan the QR Code at the top of this page.