Escoltrix

Cutting Edge Solution for a Modern Facility


# ESCOLTRIX: ARDO WELD

## Exothermic Welding Solution

## ARDO Weld (Exothermic Weld)

The Ardo Weld electrical connection process is a simple, efficient method of welding copper to copper or copper to steel and no outside source of power is required while using Ardo Weld. Ardo Weld creates a molecular bond using a exothermic reaction. The reaction takes place in a semi-permanent graphite mould (Ardo Mould) that lasts for seventy or more welds if properly cared for. The Ardo Weld reaction takes place in a very few seconds, therefore, the total amount of heat applied to the conductors or surfaces is considerably less than that employed in brazing or soldering. This is an important consideration when welding to insulated cable or thin wall pipe. Ardo Weld is ideal for field use, since it is light and portable and requires no outside power source. Using Ardo Weld requires very little time or skill to obtain an efficient, maintenance free electrical connection. In short, there is nothing better than **Ardo Weld** is available for joining high current carrying conductors.

**Ardo Weld Connection:** The Ardo Weld connection is a molecular weld. The weld metal has the same melting point as copper. Because of these factors along with the increased cross section of the connection, Ardo Weld connections:

1. Will not be affected by a high current surge. Tests have shown that the electrical conductor will melt before the Ardo Weld connection when subjected to high short circuit current. Consult I.E.E.E. Standard 837-1989.
2. Will not loosen or corrode at the point of weld. There are no contact surfaces or mechanical pressures involved. An Ardo Weld connection becomes an integral part of the conductor.
3. Possess a current-carrying capacity equal to or greater than that of the conductors. Ardo Weld equipment has been used to weld materials other than copper for electrical purposes. Materials welded includes: Stainless Steel, Copper Clad Steel, Steel Rail, Brass, Plain Steel, Bronze, Galvanized Steel Wrought Iron and Cast Iron.

### Advantages of using ARDO Weld (Exothermic Weld):

- Assurance of a permanent welding and a low resistance connection, essential for ensuring hardwearing and enduring benefits in earthing.
- Excellent corrosion resistance - resistant to galvanic corrosion, no degradation over time
- Superior electrical conductivity than that of the conductors themselves
- Higher mechanical strength than that of the conductors themselves
- Permanent molecular bond - will not loosen or corrode
- Capacity to withstand repeated electrical discharges
- Capacity to withstand repeated faults
- Welding of different metals possible
- Visual checking of quality possible
- Low labour costs
- Light, portable
- Worldwide acceptance.
- Exothermic weld is recommended by learned engineers and power sector bodies and is made mandatory for joining high current carrying conductors.



## ARDO WELD POWDER

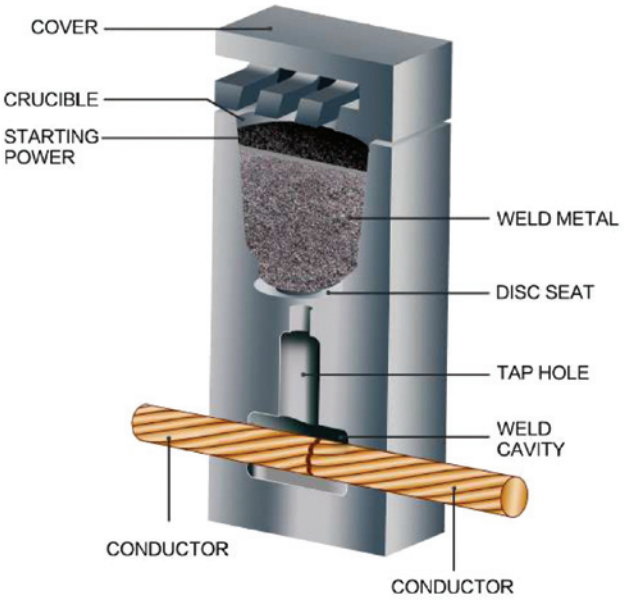

- ARDO WELD powder is a mixture of copper oxide and aluminium, packaged by size in individual plastic tubes or bags.
- Each tube contains the starting material in the lid, with the weld powder in the tube.
- Each bag contains weld powder in the vacuum aluminum foil and starting meterials are provided separately in the tube.
- These containers are packaged in plastic boxes with the corresponding metal disks. Each weld uses one disk.
- These materials are not explosive and not subject to spontaneous ignition.

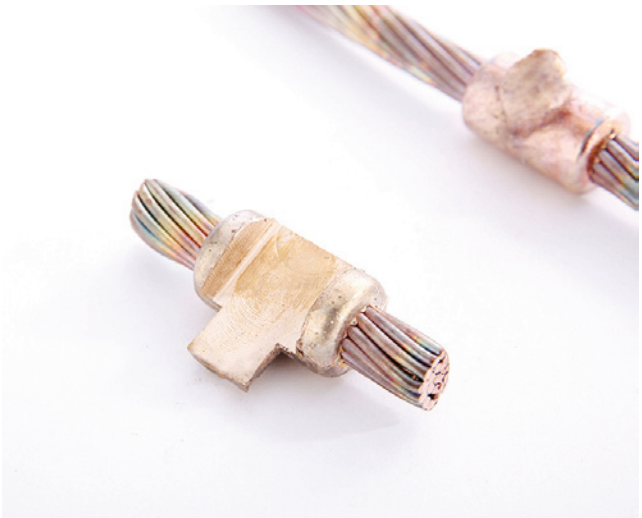
# The molecular bond that eliminates connections by forming an electrically perfect bond unaffected by corrosion

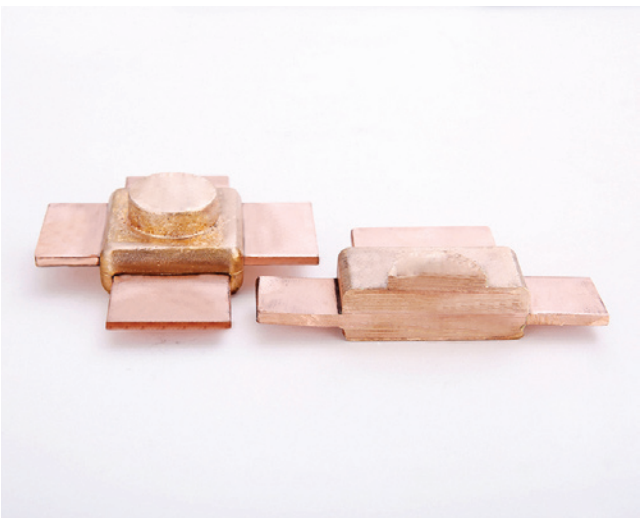
Connections are the weak point of all electrical circuits and especially earthing circuits subjected to aging and corrosion. The capacity of an earthing circuit to protect the safety of personnel depends on the quality of the connections made.

**Welding Metal**

- High temperature reaction can molten large cross-section cable
- No toxic and heavy metal
- No slag and porosity
- Smooth reaction
- Low resistance





# ARDO WELD – The Molecular Bond

The ARDO WELD process provides a way to produce copper to copper, copper to steel molecular bonds with no external energy or heat source.

The principle consists of bringing together a welding materials and ignition agent in a suitable graphite mould. The reduction of copper oxide by aluminium produces molten copper and aluminium oxide slag at extremely high temperatures.

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

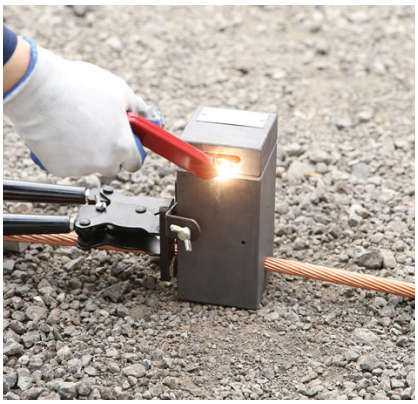
## INSTALLATION IS EASY

1. Position cleaned conductors in mold after making sure mold is dry, by pre-heating or making a test joint.

2. Place metal disc in bottom of mold crucible.

3. Dump weld powder into crucible.

4. Sprinkle the starting powder over the weld powder and onto the lip of the mold. Close the cover.



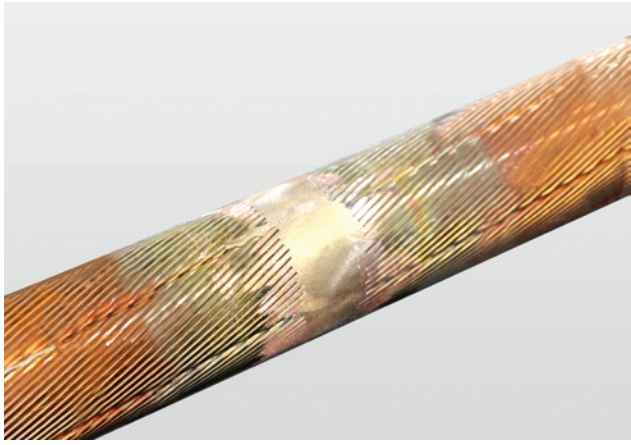
5. Ignite the starting powder with the Flint Ignitor.

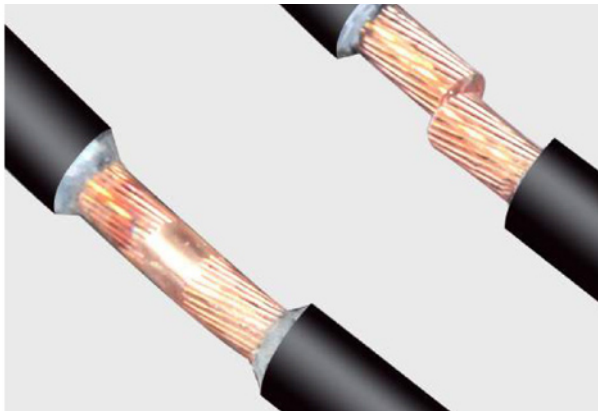
6. Remove weld and clean mold before making next connection.

# SAFE WELDED HIGH-VOLTAGE POWER CONNECTIONS

## BETTER THAN MECHANICAL CONNECTIONS, LESS LABOR AND COST

ARDO WELD high-voltage welds are permanent molecular bonds that cannot loosen or deteriorate, no maintenance is required and no resistance increase over time, so there is a continuous optimal electrical path. This makes ARDO WELD connections superior to traditional compression or mechanical connections that provide only surface contact between conductors and a less-than-perfect current path. In addition, ARDO WELD highvoltage welding system is easier to use and lower in labor cost, since you don't need a certified welder. Full on site training can be provided by ARDO WELD Engineers.





## A LOW EMISSION PROCESS

ARDO WELD high-voltage welding set-up uses a unique smoke filter system which prevents sparks and produces minimal smoke, but also reduces dust and other emissions to an acceptable level for exposures, even if used in unventilated small rooms and cable tunnels.

# ARDO WELD safe welding is a reliable method of quickly making electrical connections.

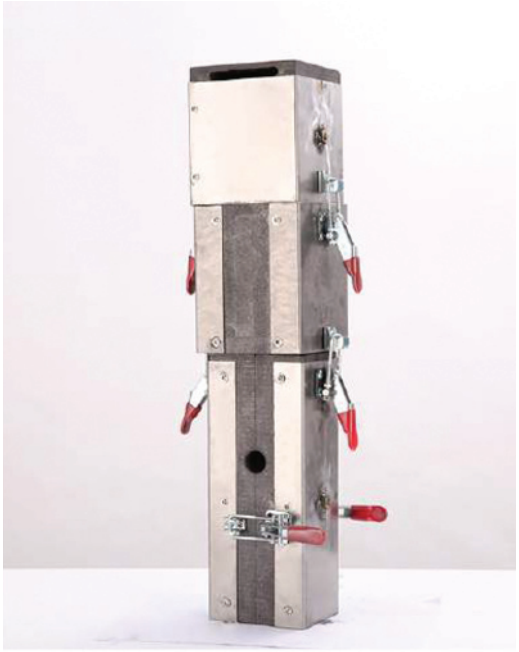
## OPTIMUM STANDARDIZATION:

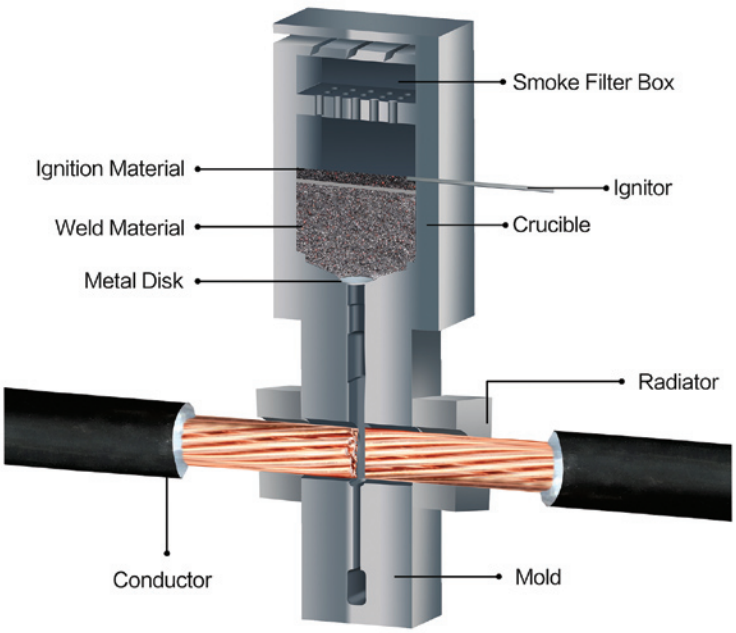
Welding equipment (crucible, smokefilter body, frames, etc.) is standardized and can be used on all connections. Only different molds and different types of welding material are needed for Copper welds.

ARDO WELD safe connections give you a single process for making all cable-to-cable, splices and terminations connections.

The welding material contains copper and aluminum oxide as well as additional ingredients.

The ignitor starts an exothermic reaction inside the crucible, producing the molten copper or molten aluminum. The molten material then flows from the crucible into the mold, welding the ends of the conductors to create the molecular bond.





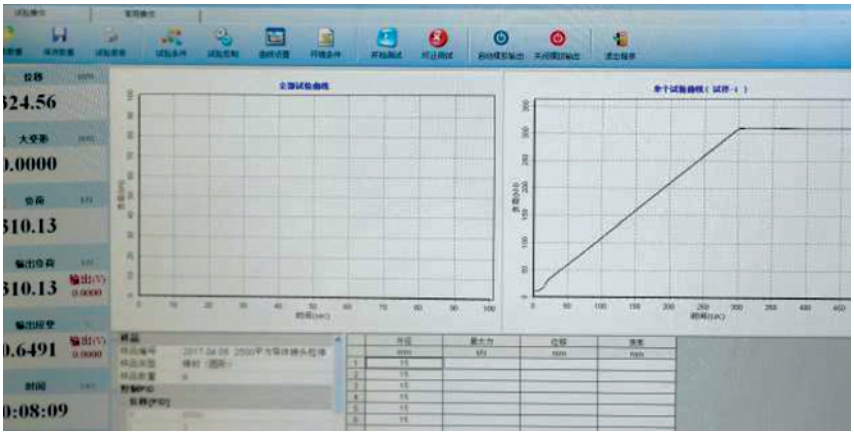

## ARDO WELD SAFE High-Voltage System Advantages:

- ARDO WELD SAFE high-voltage welding system can weld different sections copper cables.
- ARDO WELD SAFE connections can be made easily with minimal training.
- ARDO WELD SAFE weld is small –handling is simple after welding
- Specially designed weld profile for high-voltage applications.
- No external power or heat source required. Has a current carrying capacity equal to that of the conductor.
- Permanent molecular bond will not deteriorate with age, cannot loosen or corrode.
- Will withstand repeated faults, is made with lightweight equipment, has low labor cost and is time saving on jobsites.

# ARDO WELD SAFE WELDED HIGH-VOLTAGE POWER CONNECTIONS

## Strength results

In laboratory tests, the tensile strength of ESCOLTRIX: ARDO WELD SAFE high-voltage cable connections proved to have overall strong results. The tests show on average that the ARDO WELD connection provides about 75% tensile strength compared to the cable by itself. Test results vary between approx. 60% up to 90% tensile strength, whereby the breaking point is annealed cable at the edge of the ARDO WELD.



## Performance results

Like ARDO WELD SAFE connections, their permanent low resistivity provides a current-carrying capacity that's greater than the conductors.

## Applications

- Substations
- Buildings
- Data Centre
- Rail Bonds & Connections
- Water Treatment Plant
- Hospital
- Nuclear Plant
- Airport
- Cell Tower
- Wind Farm
- Petrochem

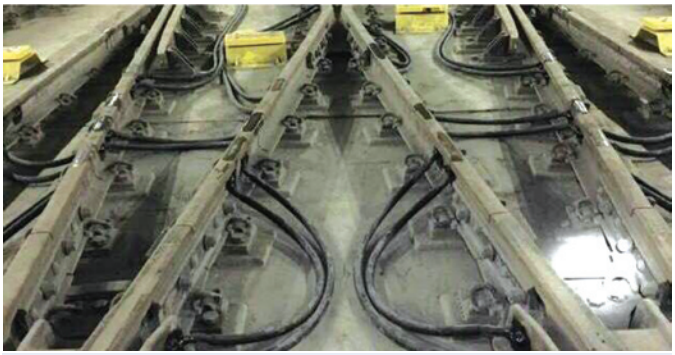
# RAILWAY SIGNALING BOND

## Railway Electrical Protection

The consequences of an unexpected lightning strike or power surge can be catastrophic for a facility:

- Risk to personnel
- Critical equipment may be damaged, or destroyed
- Data can be corrupted
- The costs of operational downtime and lost revenue can be very substantial

As the railway industry becomes more dependent on increasingly sensitive equipment, proper protection from lightning and dangerous over-voltage transients is necessary.



After a long period of research, testing and product development, ESCOLTRIX has acknowledged that no single technology can totally eliminate vulnerability to lightning and power surges.

### Connections to the Rail

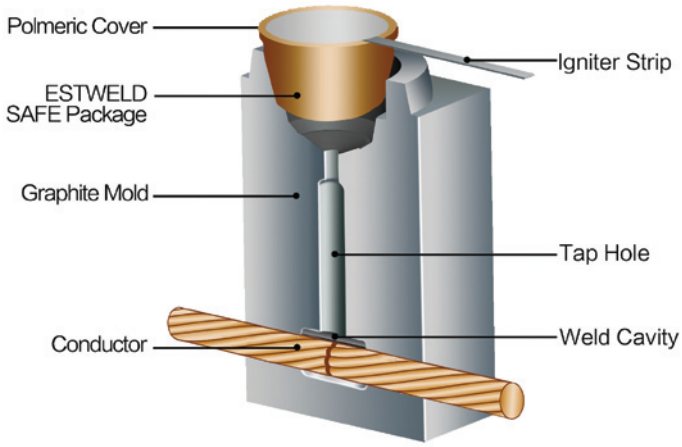
ARDO WELD is a molecular bond which-when properly applied-cannot loosen,resists corrosion and produces a maintenance-free electrical connection.

Railway signaling is a system used to control traffic safely.essentially to prevent trains from colliding.

Exothermic welding is one of the most popular methods of railway signaling bond.In welding process, the mastensite is formed by rapid cooling,quenching,of autensite which traps carbon atoms that do not have enough time to diffuse out of the the ctystal structure. When viewed in cross- section,the lenticular(lens-shaped) crystal grains appear acicular(needle-shaped) crystal grains appear acicular (needle-shaped). Martensite affect to the rail with increasing risk of cracking and brittle.

# ARDO WELD SAFE - LEADING TECHNOLOGY

Continuing the tradition of technical leadership, ARDO WELD was developed as a simplified method of performing exothermically welded electrical connections. This trusted system now features a new ARDO WELD cup design for the integrated welding material package which has streamlined the installation process by eliminating ignition materials.




The tamper proof, integrated welding material package consists of a copper cup containing ARDO WELD patented welding material alloys and an ignition source. This newly shaped welding material package is designed for use in all standard ARDO WELD molds. Once placed in the ARDO WELD mold, thewelding material is electronically ignited using a simple battery-powered control unit with a six-foot lead.

ESCOLTRIX SAFE connections offer all the benefits of SAFE conventional ESCOLTRIX SAFE connections:

- Current carrying capacity equal to or greater than that of the conductor
- Withstand repeated fault currents without failing during operation
- Permanent, molecular bond that will not loosen or corrode, resulting in a connection with a lifetime equal to that of the installation
- Join copper to copper, copper to galvanized or plain steel, copper to copper clad steel, copper to bronze/ brass/stainless steel, steel to steel,etc.
- No external power or heat source required
- Quality Assurance Inspection is easy and visual
- Minimal installation training required
- Exceed requirements of “UL for Qualifying Permanent Connections Used In Substation Grounding”

## Feature

Integrated Welding Material Package | Electronic Control Unit | Replaceable Six foot or lengthenable Control | Unit Lead | Smoke Filter Mold

## Benefits

Simplifies training and set up | Saves labor | Simplifies cleaning | No starting material required Easy ignition | Increased flexibility in hard to reach areas | Prevent sparks and produce minimal smoke | Can be used in a specific place

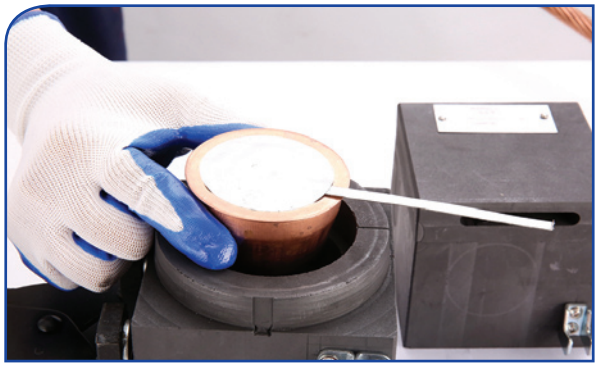
## The ARDO WELD SAFE system:

- 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 (can be extended)
- 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 by 20%
- Has safety-certified electronic igniter is designed for 500 connections with one set of 8 standard AA batteries (included) – requiring no special batteries or chargers
- Designed for use in standard ARDO WELD SAFE molds

## INSTALLATION IS EASY

4 Simple Steps For Permanently Welded Electrical Connections

STEP - 1



Insert ARDO WELD SAFE package into mold

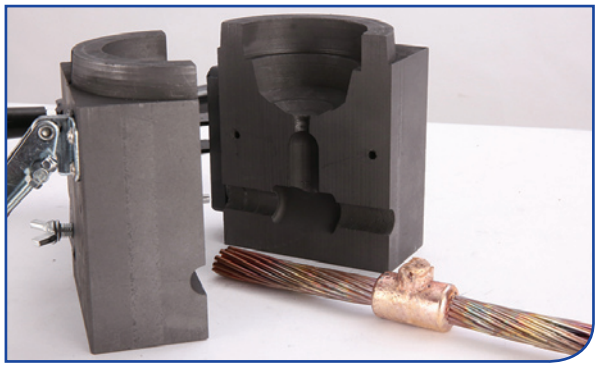
STEP - 2

Attach control unit termination clip to ignition strip

STEP - 3

Press and hold control unit switch and wait for the ignition

STEP - 4



Open the mold and remove the finished connections.







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