

The Thermite Welding Process

Thermite welding connections are the accepted method of attaching Cathodic Protection leads to pipes (steel or cast iron), tanks and structures.

Thermite welding connections attach the conductors and the structure to be protected so that no galvanic corrosion can occur at the interface. The Thermite welding process is specially designed to provide minimum heat effect on steel, which is especially important on thin-wall, high-stress pipes. Thermite welding connections are also used for header cable taps, conductor splices and terminations, as well as ground rod connections.

A Thermite welding connection ...

- Has a current carrying capacity equal to that of the conductor.
- Is permanent with a low resistance connection that cannot loosen or corrode.
- Uses lightweight, inexpensive equipment.
- Requires no external source of power or heat.
- Requires no special skills.
- Can be easily checked for quality.

Thermite welding connections are made using a semi-permanent graphite mould, which holds the conductors to be welded. Weld metal (a mixture of copper oxide and aluminum) is placed in the mould. The mould is covered and the weld metal ignited. The exothermic reaction produces molten copper, which provides a permanent, high conductivity connection.

Weld powder

Each tube contains metal weld powder, together with the correct amount of silver coloured starting powder. The powder supplied is sufficient to make the appropriate joint.

Graphite mould

The graphite mould comprises a crucible, a tap hole and a weld cavity. The exothermic reaction takes place in the crucible, the molten copper is directed by the tap hole into the weld cavity which is designed to allow easy removal of the mould from the finished joint.

This design prolongs the moulds life to allow an average of 75 joints, depending upon the level of care in use.

Mould holder

In most cases, the graphite mould is split so it can be clamped around the conductors to be joined. The mould holder can secure different types of moulds and must be ordered separately according to the type and size of joint required.



Cable cleaner

Designed for cleaning circular conductors such as rods and cables.



Standard tool kit

The tool kit comprises:

- File card brush for cleaning conductors
- Flint igniter for the starting powder
- Mould scraper for removing slag left in the crucible after a joint has been made
- Mould brush for final cleaning of the crucible, tap hole and weld cavity after making the joint

CABLE CONNECTIONS

Thermite welding

Document No.: 09-400-R1

Sheet: 2 of 2

German Cathodic Protection



Equipment for copper conductors to steel pipe connections

		GRAPHITE MOULD	POWDER CARTRIDGE	MOULD HOLDER	MOULD SCRAPER	CONDUCTOR SLEEVE
SOLID CONDUCTOR	Nominal area 2.5 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 4 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 6 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 10 mm ²	GM-02	PC-32	MH-129	MS-B136A	CS-H102
	Nominal area 16 mm ²	GM-01	PC-15	MH-129	MS-B136A	---
STRANDED CONDUCTOR	Nominal area 2.5 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 4 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 6 mm ²	GM-01	PC-15	MH-129	MS-B136A	CS-H105
	Nominal area 10 mm ²	GM-02	PC-32	MH-129	MS-B136A	CS-H102
	Nominal area 16 mm ²	GM-01	PC-15	MH-129	MS-B136A	---
	Nominal area 25 mm ²	GM-02	PC-32	MH-129	MS-B136A	---
	Nominal area 35 mm ²	GM-03	PC-32	MH-129	MS-B136A	---
	Nominal area 50 mm ²	GM-04	PC-45	MH-129	MS-B136A	---
	Nominal area 70 mm ²	GM-05	PC-65	MH-129	MS-B136A	---
	Nominal area 95 mm ²	GM-06	PC-115	MH-160	MS-B136B	---
	Nominal area 120 mm ²	GM-07	PC-115	MH-160	MS-B136B	---
Nominal area 150 mm ²	GM-08	PC-150	MH-160	MS-B136B	---	