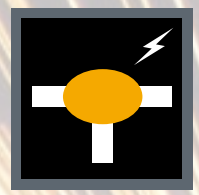
4

WELDING



> APLIWELD® SECURE+ EXOTHERMIC WELDING SYSTEM

> EXOTHERMIC WELDING IN TABLETS

APLIWELD® Secure+ replaces the traditional welding powders and their manual spark activation with a tablet compound shape activated remotely using an electronic starter.

> APLIWELD®-T
Welding compounds in tablets

> APLIWELD®-E
Electronic starters for exothermic welding

> KIT APLIWELD®-E
Electronic starting device

REDUCES OCCUPATIONAL HAZARDS
> Remote ignition control
> Non-flammable materials involved

SAVES ON COST
> No package size limitations
> Simplifies transport and storage conditions
> Reduces workforce and training

SIMPLIFIES WORK
> Easy to use
> Enables work to continue in windy or humid conditions
> Reduces waste

> APLIWELD® SECURE+ EXOTHERMIC WELDING SYSTEM

> EXOTHERMIC WELDING IN TABLETS

> CERTIFICATIONS

Certification in agreement with UL467 Grounding and bonding equipment

Underwriters Laboratories is a global recognised safety science company which certifies, validates and tests a wide range of products. In electrical connections, and particularly for exothermic welding, UL467 standard "Grounding and bonding equipment" is the reference for the quality and reliability in connections between electric conductors. Connections are subject to a current test and a stringent mechanical test, involving two parts: a secureness and pull-out assays.

Apliweld has achieved this UL certification for the cable/cable, cable/earth rod, cable/metal surface and tape/tape connections appearing in this catalogue and validated in UL installations. Also 50 mm^2 cable and cross shape rebar, 30 x 2 mm tape to T-shape earth rod and all 50 mm^2 cable to 30 x 2 mm tape connections are certified.

Explosive atmosphere certificate:

The Apliweld compound has shown zero flammability, passing the explosive atmosphere test in Laboratorio Oficial Madariaga (LOM). In this assay, explosive limits, minimum flammability energy and temperature, as well as parameters such as pressure and product explosive limits are tested under the applicable UNE standards. The sample turned out to be inert during testing and was classified as St0, or non-explosive/non-flammable.

Other certifications

Apliweld Secure+ has passed short-current tests supervised by the Technological Institute of Energy (ITE) in Spain, demonstrating even better conductivity than the conductors themselves.

> REGULATIONS

Compliance with NTP 1028 safety in copper aluminothermic welding.

"The electronic ignition method is the most suitable for aluminothermic welding, as it encompasses significant improvements in safety in relation to any other method"

Compliance with ITC-BT-26 internal housing installations. General installation requirements.

"Earthings: […] if applicable, the metal structure of the building will be connected to the annealed conductor, or the electrodes, or when the foundation of the structure is built using reinforced concrete footings, a certain number of irons of those considered most important and a minimum of one per footing. Those connections will be made in a safe and reliable way using aluminothermic or autogenous welding methods"

WITH ALL THE BENEFITS OF EXOTHERMIC WELDING

The connection has equal or higher electrical conductivity than the conductors themselves.

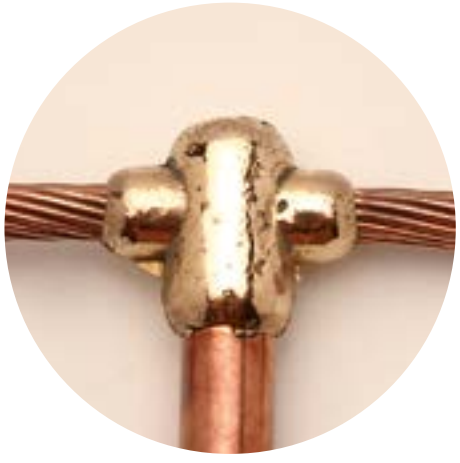
Welding does not degrade throughout time and is resistant to galvanic coupling.

Withstands repeated current impulses.

Resistance never increases.

Higher mechanical and crush resistance than the conductors themselves.

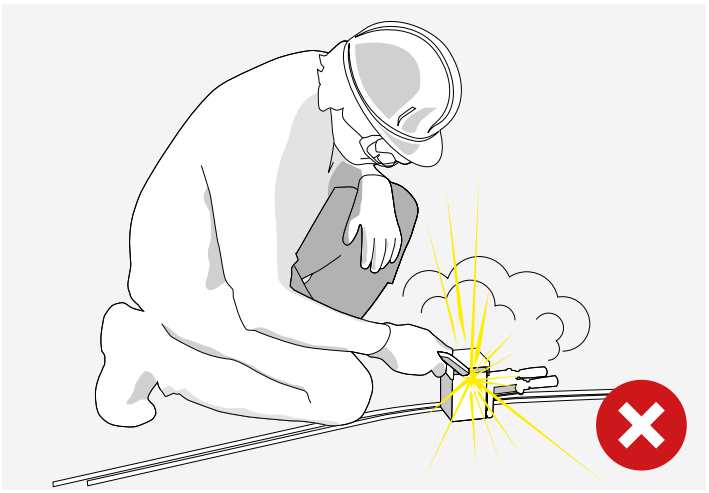
Apliweld® Secure+ offers a permanent welding and high-resistance connection which is essential to achieve a lasting and reliable result for any earthing.



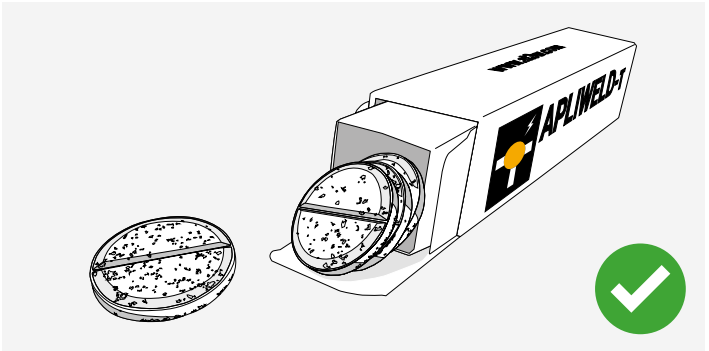
> APLIWELD® SECURE+ EXOTHERMIC WELDING SYSTEM

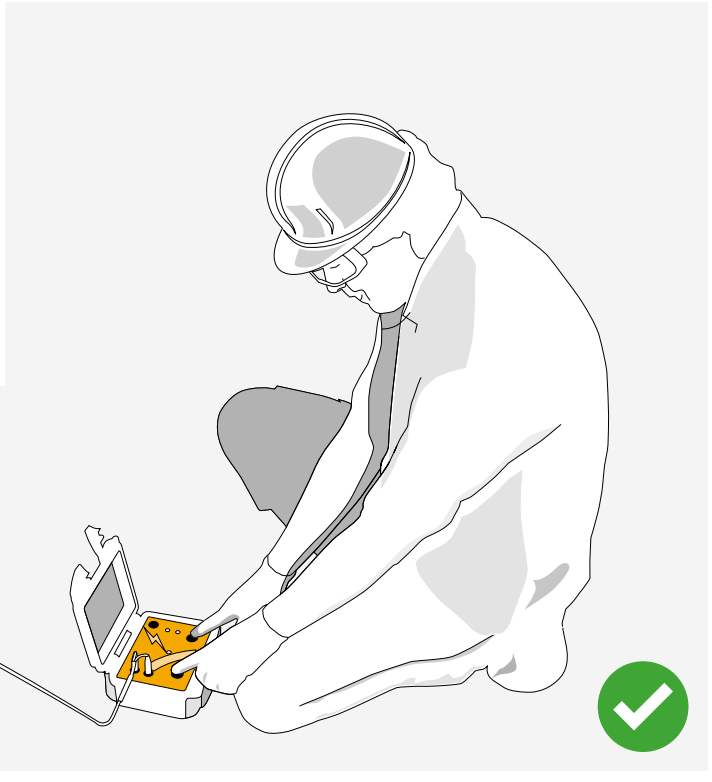
> INNOVATION, REDUCTION IN STORAGE COSTS AND INCREASED SAFETY

Traditionally, exothermic welding required the user to have multiple cartridges with different powder weights for carrying out the various connections. Once the conductors were inserted in the graphite mould, the welding compound and the reactive powder (usually a flammable compound) were poured into the crucible. Then a flint gun, applied manually to the starting powder at arm's length produced a spark triggering the exothermic reaction.



With **APLIWELD® Secure+** the required number of tablets are placed inside the graphite mould. The electronic starter is inserted on top and activated from a distance. Hence there is no need for multiple cartridges and it is completely safe for the operator.

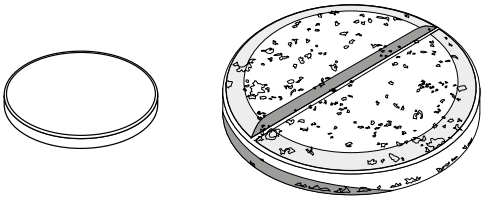




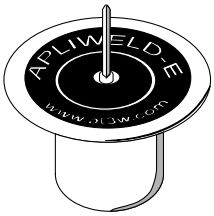
> APLIWELD® SECURE+ EXOTHERMIC WELDING SYSTEM

> THIS IS HOW THE NEW COMPONENTS ARE USED

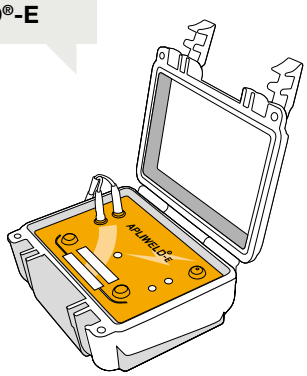
Insert the retaining disc and the **APLIWELD®-T tablets**



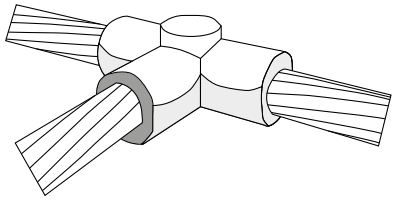
Insert and connect the electronic starter **APLIWELD®-E**



Press both buttons at the same time in **Kit APLIWELD®-E**



Remove the completed joint from the **graphite mould**



> APLIWELD® SECURE+

> APLIWELD®-T

AT-020N: tablets for exothermic welding

Innovative welding compound in tablet form for carrying out any connections using one or more tablets.

Two references: **AT-020N**, the most common one (valid for 90% of connections) and **AT-021N**, biggest tablets, suitable for welding larger conductors.

- ✓ Compact and easy to use
- ✓ Reduces stock costs
- ✓ Improves welding process times
- ✓ Increases equipment life-time
- ✓ Both electronic and powder starters can be used

> TECHNICAL CHARACTERISTICS

Reference:	AT-020N	AT-021N
Tablet dimensions:	Ø43 mm	Ø55 mm
Units per pack:	20 tablets	20 tablets
Dimensions:	52 x 52 x 220 mm	66 x 66 x 260 mm
Weight:	900 g	2.000 g

> APLIWELD®-E

AT-010N: electronic starter for exothermic welding

Non-flammable electronic starters only ignite by means of the energy they receive from the ignition device.

Includes 10 metal retaining disks for better product/slag separation.

> TECHNICAL CHARACTERISTICS

Reference:	AT-010N
Dimensions:	Ø24 mm x 26 mm
Units per pack:	10 starters
Dimensions:	125 x 105 x 40 mm
Weight:	130 g
Reaction time:	<10 seconds
Material:	non-flammable

- ✓ Its safety features in terms of handling, storage and transport reduce occupational hazards labour risks
- ✓ Safe and easy set up

> KIT APLIWELD®-E

AT-100N: ignition box

Ignition box enables controlled and remote electronic ignition in a quick and safe way. Includes: ignition unit (**AT-096N**), cable (**AT-098N**), 5 crocodile clips (**AT-099N**), battery charger and transporting bag.

> TECHNICAL CHARACTERISTICS

Reference:	AT-100N
Power supply:	Lead-acid battery 6 V 7 Ah
Operating voltage:	6 V_{DC}
Battery charge:	12-36V_{DC} 500 mA
Battery life:	more than 100 welds
Case dimensions:	216 x 180 x 102 mm
Case weight:	2.300 g
Cable dimensions:	2 x 1.5 x 1.500 mm
Total packaging weight:	3.500 g
Work temperature:	-10 ºC to +60 ºC

- ✓ Enables remote electronic ignition thereby reducing occupational hazards

> GRAPHITE MOULDS

> SPECIFIC MOULDS

Each mould makes a particular connection: one mould welds two specific conductors (cable to cable, tape to tape, cable to earth rod…), with specific dimensions (50 mm², 70 mm², etc.) and joined in a certain way (cross or T shape etc.).

> TECHNICAL CHARACTERISTICS

> Each mould can carry out around 50-100 welds, depending on the model.

> Consult all references, accessories and required tablets in this guide (reference selection on pages 156-169) or use the “specific mould selection” on our website.

> The welding manual explains the procedures for correctly using specific moulds. **APLIWELD®** (download it at www.at3w.com).

> All specific moulds are adapted for both the electronic starter (**APLIWELD-E®**) and starting powder (**AT-012N**) ignition types.

> MULTIPLE MOULD

The multiple mould is a system designed to make different connections using the same graphite pieces (see multiple mould selection guide on page 168).

> TECHNICAL CHARACTERISTICS

> Multiple mould is focused for horizontal T, cross and earth rod welding. However, in some cases it can also weld straightand parallel bonds. It welds cables up to 95 mm², tapes up to 30 mm wide and earth rods up to 19 mm in diameter.

> The product is supplied in a case that contains all the necessary materials to carry out the welding, except for the consumables (see page 168).

> The **MM-CS** cavity sealants are, along with the tablets, the consumables involved in the process. MM-CS are supplied in packets of 60 units. They form the welding cavity and are placed according to the table of connections (see page 168).

> Graphite moulds can withstand at least 80 welds.

> The multiple mould is the best solution if only a few common welding types are required, when the features of the work to be carried out cannot be predicted, when conductor sizes are variable or in case of any unexpected occurrences during installation.

> Read the instructions provided with all multiple mould cases or download the **APLIWELD®** manual at www.at3w.com.

> It is adapted for both electronic starter (**APLIWELD-E®**) and starting powder (**AT-012N**) ignition types.

> ACCESSORIES

> CLAMPS, CLEANING TOOLS, CONDUCTOR FITTINGS AND OTHERS

> BASIC ACCESSORIES KIT

AT-068N

AT-069N is a cleaning tool set for conductors and moulds. It includes safety gloves and sealing paste.

The **AT-068N** tool set involves the same references as the one described but also includes a spark lighter, (**AT-060N**) essential for traditional starting powder ignition.

> TECHNICAL CHARACTERISTICS

AT-069N	Reference	Description
Includes:	AT-061N	Conductor cleaning brush
	AT-062N	Crucible and electronic starter cavity cleaning brush
	AT-063N	Slag scraper
	AT-064N	Welding cavity cleaning brush
	AT-065N	Sealing paste (0.45 kg)
	AT-073N	Safety gloves
Dimensions:	250 x 125 x 140 mm	
Weight:	1.000 g	

It is advisable to have a new set for every 250 welds

> GENERAL CLAMP TYPE S

AT-049N

Accessory to facilitate safe fastening, closing and handling of the moulds it is to be used with. This is the most common clamp, suitable for approximately 80% of connections. For connections to a metal surface (HT and HP type), **AT-058N** tool should be used together with the clamp **AT-049N** to avoid loss of material.

> TECHNICAL CHARACTERISTICS

Reference	**AT-049N**
Dimensions:	65 x 65 x 250 mm
Weight:	1.250 g
Service life:	Approx. 250 welds

> GENERAL CLAMP TYPE G

AT-050N

Accessory similar to **AT-049N** but bigger. Valid for large conductors and some particular welds such as LO, XO,TO types.

For connections to a metal surface (HT and HP type), **AT-058N** tool should be used together with the clamp **AT-050N** to avoid loss of material.

> TECHNICAL CHARACTERISTICS

Reference	**AT-050N**
Dimensions:	80 x 80 x 275 mm
Weight:	1.470 g
Service life:	Approx. 250 welds

> ACCESSORIES

> CLAMPS, CLEANING TOOLS, CONDUCTOR FITTINGS AND OTHERS

> OTHER CLAMPS AND ACCESSORIES

Besides the described products, other accessories are required for less common connections or to ensure good quality welding according to working conditions. Find all the references on page 169. The most common accessories are described next:

AT-065N: Sealing paste (0.45 kg). **AT-066N** (0.9 kg) and **AT-071N** (2.25 kg) also available.

MM-053N: Multiple mould clamp.

AT-051N: Clamp for vertical metal surface splices or along vertical rebars or earth rods.

AT-077N: Safety goggles: Recommended for all works.

AT-059N: Cable-holder clamp to prevent conductors from separating during the welding reaction. Complements **AT-049N** or **AT-050N** in any connection involving a through cable.

AT-072NCXX: Copper adapter sleeves with variable diameters depending on XX selection. XX indicates the mm^2 of the desired cable.They increase the conductor diameter fitting it in a mould designed for this XX bigger cable. X = 50, 70, 120...