



Advanced TIG Functions

English

Advanced TIG functions

Weco has developed some
innovative

TIG

functions

in order to find out an effective
solution for any application.

Also the impossible becomes possible.



Advanced DC TIG functions



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Dynamic Arc ... 5



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MULTITACK ... 10

Advanced AC TIG functions



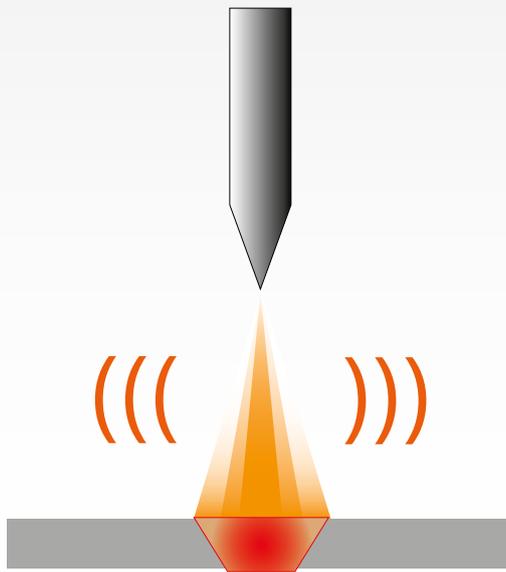
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Q-Start (Quick Start)



The Q-START (Quick Start) function makes it possible to minimise sheet tacking. A series of adjustable duration pulses creates a movement of molten material between the two edges in order to accelerate the join. This function is invaluable in the case of seams with slight openings or with irregular preparation.

The alternation of high and low current pulses constantly changes the electric arc geometry from wide to narrow. Movement of the molten material, which, follows the arc geometry, is such that the two molten edges are rapidly brought into contact.

The duration of the series of pulses can be adjusted, (from 0.1 to 60seconds) depending on the thickness and shape.

Q-Start Applications



Q-START results consist in a more rapid start of the welding process.

When it is used for the tacking, it is possible to obtain very clear spots without any oxidation stains.



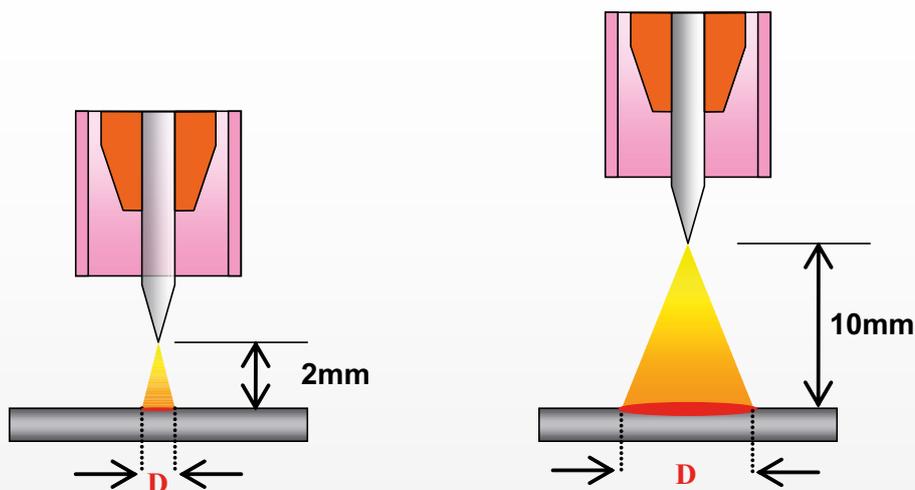
Dynamic Arc

The Dynamic Arc function allows an increase of the welding current when the arc voltage decreases and vice versa (the power source reduces the welding current if the arc voltage increases).

The DynamicArc value can be adjusted from a minimum of 1 Ampere to a maximum of 50 Ampere per each variation of 1 Volt, wether positive or negative.

This value must be set in accordance with the thickness of the base material, and the type of processing that has to be carried out (recommended values between 1A and 20A for thin gauges and values between 20A e 50A for thicker gauges). It follows that in spite of the arc length variations the energy absorption remains constant.

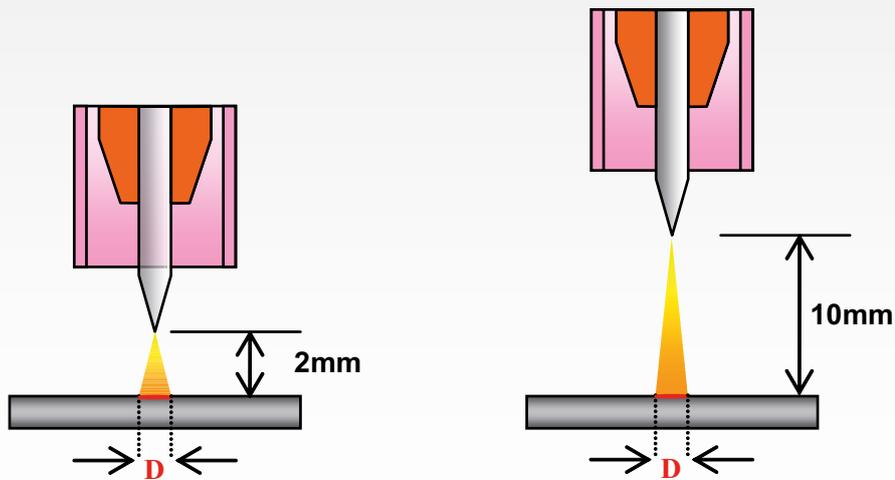
TIG DC Standard / Welding



When the arc length changes, the melting pool (D) becomes wider with consequent increase of the heat output on the base material which is subjected to overheating.

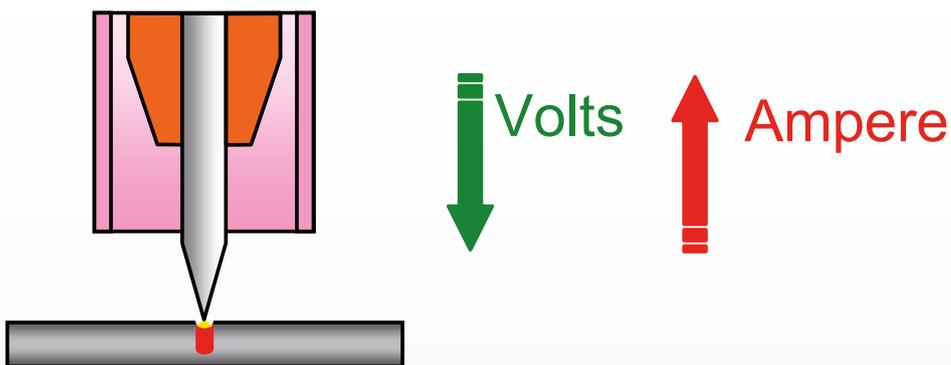


Dynamic Arc TIG DC Welding



When the arc length changes, the melting pool maintains exactly the same width (D) avoiding the base material's overheating, any plastic deformation and any loss of its mechanical features.

Dynamic Arc effects



The Dynamic Arc function permits the welding with extremely short arcs. When the electrode is very close to the base material, the current increase avoids the contact by the shifting of the welding pool. This prevents both the electrode's sticking at the material and the inclusion of tungsten's particles on the deposit.

Dynamic Arc Benefits

- Faster welding.
- Reduced plastic deformation of the welded part.
- Increased vertex penetration.
- Heat concentrated only at the point of the weld and not in the surrounding area.
- Less oxidation of the part and hence reduced cost of post welding operations.
- Improved control of the first root pass (helpful for plumbers and plant engineers).
- Less risk of electrode sticking when it touches the weld puddle.
- Easy welding also on irregular prepared pices.
- Reduced margin of error and increased arc stability in spite of torch moving variation.
- Through the combination between Puls and High frequency it is possible the obtaining of a very focused arc with higher power density.

Dynamic Arc Applications



TIG DC continuous fillet weld without additional material



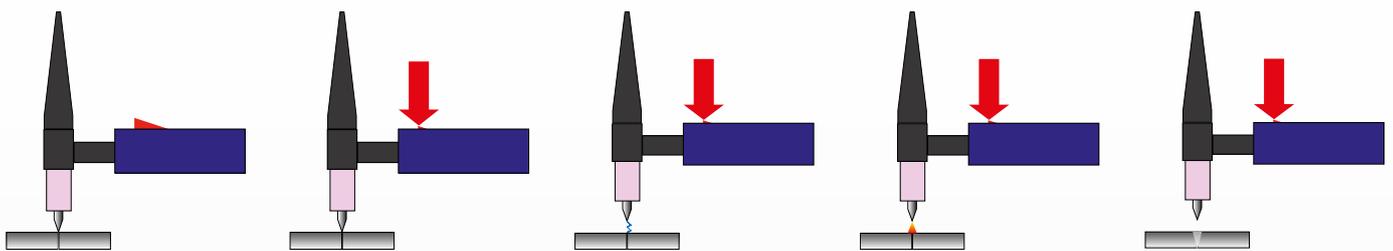
TIG DC continuous fillet weld without additional material
by Dynamic Arc



The new Q-Spot function greatly facilitates the spot welding process:

- It allows precise positioning of the electrode in the point to be joined (at the closest possible distance); the electrode is conveniently placed on the fixing point so the operator can perfectly control the entire cycle.
- Once the electrode is lifted the machine emits a welding current pulse with a present time. This means that the sheet metal edges are instantly joined with the minimum heat transfer.
- The risk of contamination of the joint and the electrode falls significantly.

Q-Spot Steps



1.

Positioning the torch with the electrode on the workpiece.

2.

Press the torch trigger and keep it pressed.

3.

Lift the torch slightly. As soon as the electrode is lifted then the HF ignition starts.

4.

The arc ignites for few hundredths of a second (time can be set up).

5.

The result of this is a very precise, not oxidized welding spot without any plastic deformation of the sheet.

Q-Spot Applications



Butt-weld 0,6mm

Pipe weld application
5/4 x 2mm



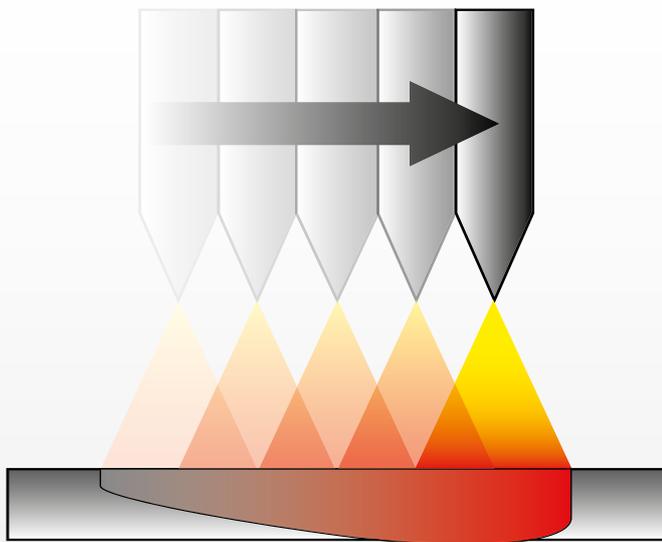
Fillet 0,6mm

MULTITACK

This function makes it possible to minimize the heat output when joining two gauge parts.

The series of arc strikes at short time intervals allows the material to cool during the pause between one strike and the next and thus minimizes its deformation. The facility to adjust the frequency of the series of arc strikes in the time unit makes it possible to adapt the electric arc to the welding speed and the join geometry.

TIG DC Standard Welding



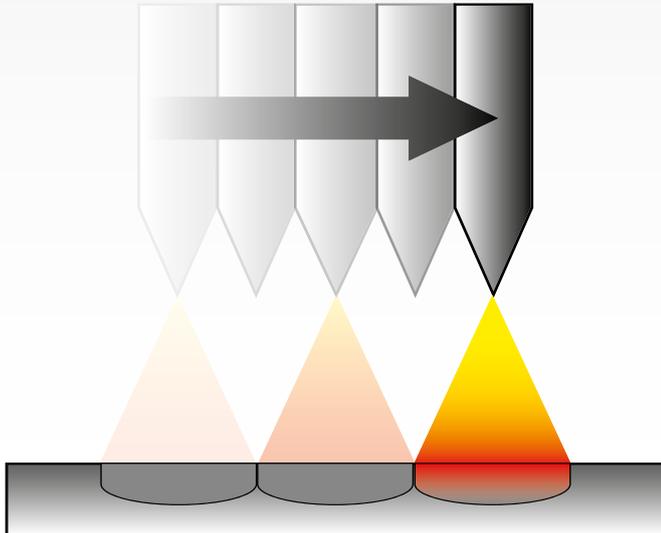
The continuous welding current supplies a continuous energy that prevents the workpiece cooling and causes its overheating with consequent excessive penetration and deformation.

Using a pulsed current it is possible to reduce the overheating's effect, but not totally, in fact the arc remains always alight and so it keeps on to supplying both power and heat.



Overheating and excessive penetration.

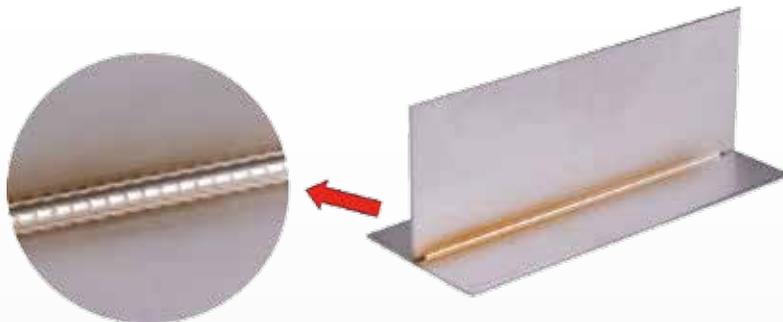
MULTITACK Welding



The series of repeated arc strikes at short time intervals allows the material to cool during the pause between one strike and the next.

The Adjusting of the arc strikes' frequency in the time unit, makes it possible the optimizing both of the welding penetration and execution speed, above all the heat output remains under control with consequent reduced workpiece's deformation.

MULTITACK Applications



Butt-weld

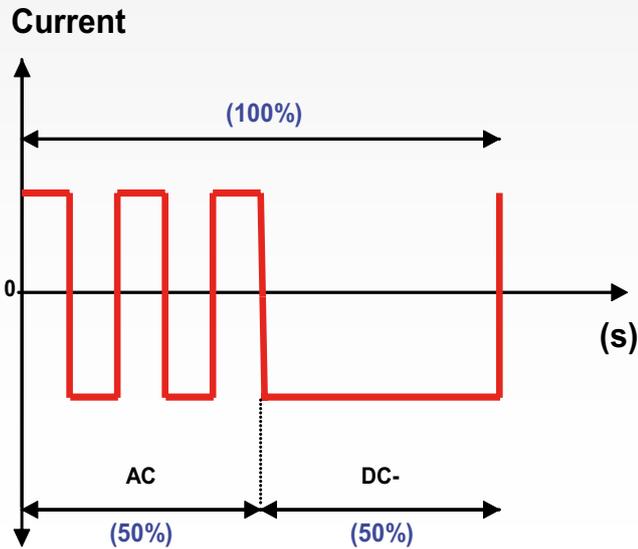
Surfacing



In the fillet welding it is possible the use of Multitack which allows to achieve excellent results. The weld remains white and without any oxidation, thus prevents the acid treatments which often must be applied post welding.

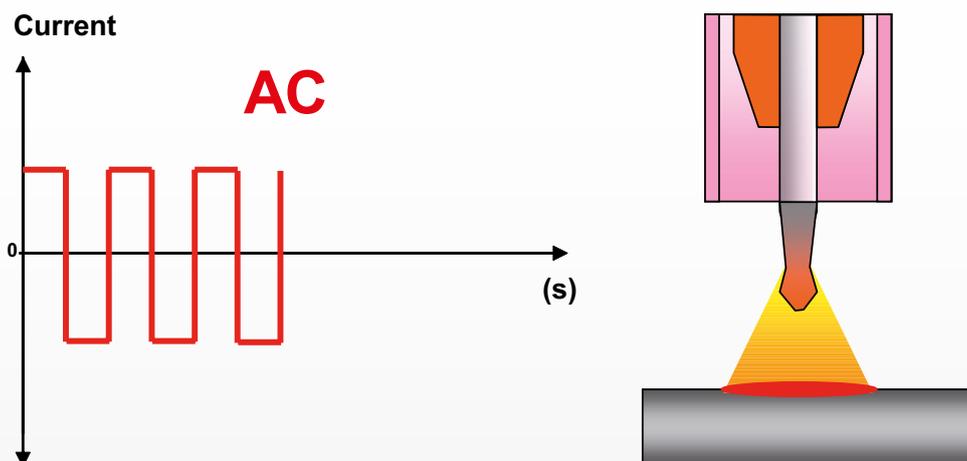


MIX AC/DC



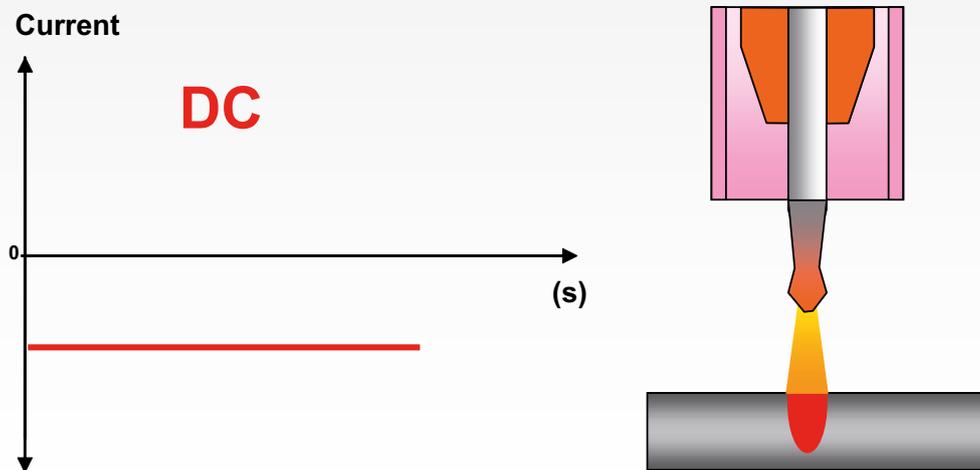
This function makes it possible to modulate the welding current, alternating a half-period of TIG AC with a half-period of TIG DC-. This means that the efficacy of AC TIG welding can be combined with the high penetration of DC TIG welding, thus obtaining high welding speed and creating the weld puddle rapidly on a cold workpiece. It is also possible to weld heavier gauges with lower amperage, since the DC- portion is far higher than when using an entirely AC waveform. The operator adjustable parameter is the percentage of AC waveform compared to DC- waveform over the entire period, which can be varied from 10% to 80%.

Half-period AC



During the TIG AC half-period there is the pickling of the weld puddle.

Half-period DC-



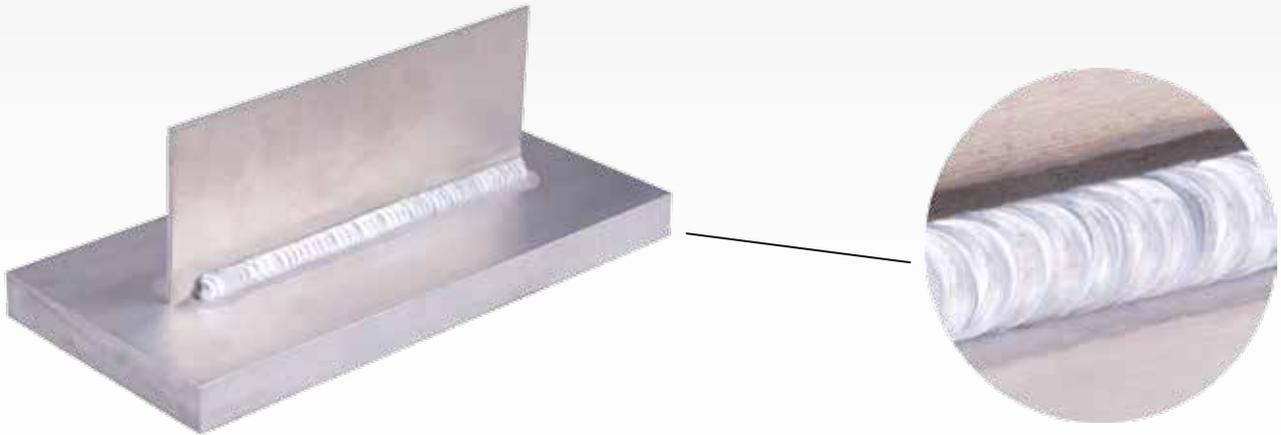
During the TIG DC half period there is high penetration in the workpiece.

Main benefits of MIX AC/DC

- Welding of heavy gauge sheets with lower current than necessary when using an exclusively AC supply
- Very fast execution thanks to the high percentage of DC - current present in the period
- Very fast creation of the weld puddle (ideal for facing of tools, dies and heavy gauge castings)
- Welding of extremely diverse thickness sheets (1 mm to 10 mm)

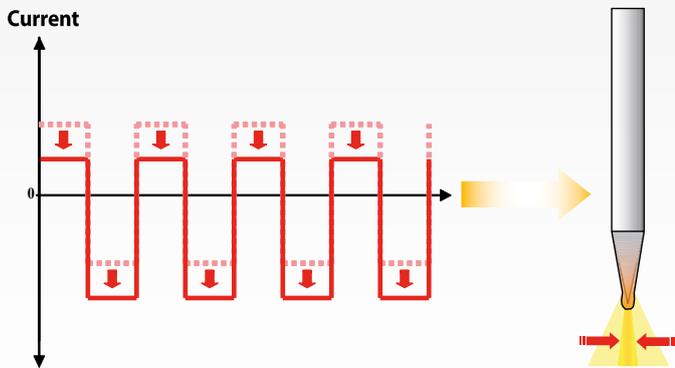
It is good practice never to exceed the value of 50% DC - waveform, which would otherwise impair the pickling of the part and the appearance of the weld bead.

MIX AC/DC Applications



Welding of diverse thickness sheets:
The concentration of the energy transferred to the workpiece allows the control of the fusion bath and the joining of different thickness sheets.

Extra Fusion



Thus function makes it possible to shift the waveform towards the negative part with respect to zero. This makes it possible to create a highly penetrative and precise fusion bath so that very light gauge sheets can be welded with an electrode tip comparable to that of an electrode for DC - TIG welding. The adjustable value in our AC/DC TIG power sources ranges from 0% to 80% (with respect to the DC - half-wave percentage).

The Extra Fusion function is not recommended when welding heavy gauges because the DC+ component is insufficient to ensure optimal cleaning (pickling) of the part during the welding process.

Extra Fusion Applications



Fillet welding of specific 0,8mm thickness sheet



Particular on the fillet welding.
It is possible to notice the remarkable degree of finishing and the high welding precision





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