



## What is Arc Welding?

Arc welding - more accurately described as Manual Metal Arc welding (MMA) enables two or more pieces of metal to be fused together by means of an electric current, better known as the ARC, flowing directly across the gap between the metal being welded and an arc welding rod.

The electric arc, provided by the Arc welding plant, causes a portion of the metal work piece to melt forming a molten pool of metal. The arc welding rod, which is coated with flux to prevent the molten material from reacting with the surrounding atmosphere and to facilitate the stability of the arc, is melted simultaneously and added to the molten pool of material. This mixture forms the weld.

Basic arc welders do not make use of complicated electronics which means they are reasonably priced, reliable and uncomplicated. However, they do have a few limitations, such as being restricted to weld thicker material from 1.5mm and upwards.

The weld requires some cleaning after the process is complete and practice is recommended in order to obtain the best results.

## Definitions

### OCV ~ Open Circuit Voltage

This is the voltage that can be measured across the earth clamp and electrode holder before welding commences. Basic MMA welders have an OCV of 50 volts. The larger welding plants in our range have an OCV of 80 volts. The higher the OCV the greater range of specialist electrodes can be used.

### Electrode

A consumable rod which melts into the molten pool to create the weld. Usually coated with a flux to protect the molten pool from reacting with the atmosphere. When the weld is cooled it leaves a slag which is chipped away to give the final finish.

### Current Range

Measured in amperes (amps). This is the power the welding plant can supply during the welding process. The higher the current setting the deeper penetration on the work.



## What Is Mig Welding?

MIG Welding - which stands for 'Metal Inert Gas' is similar in principle to MMA welding but the method is more sophisticated.

A MIG plant makes use of a wire feed motor and a trigger activated welding torch. The welding current is passed to the welding torch which has a continuous metal wire fed through it by the wire feed motor. An arc is generated between the wire and the work causing the wire to melt simultaneously with the metal work piece. This produces a molten pool which creates the weld similar to that of MMA welding.

However a shielding gas is also fed to the torch during the entire process to act as the shielding agent, this prevents the molten material from reacting with the surrounding atmosphere.

There are two major differences between MMA and MIG welding. The first is that instead of a welding rod, MIG uses continuously fed wire from a reel, therefore frequent stopping to change the welding rod is avoided and no readjustment between the wire and the work piece is necessary since the wire being consumed is replaced continuously at the correct speed by the wire feed motor.

The second major difference is instead of having a flux coated welding rod, a shielding gas is used to protect the weld from the atmosphere, leaving little or no residue giving the benefit of cleaner welds.

MIG welding is more sophisticated, easier and cleaner, but more expensive than Arc. It is particularly suitable for welding very thin sheet metals such as car body panels.

## Gasless

Gasless wire feed welding is a different process which combines features from both MMA and MIG welding to produce very simple, reasonably clean no nonsense results.

This type of welder is more similar to MIG than the MMA unit in as much as it utilises continuously fed wire through the torch as the electrode or rod, to help create the molten pool. However, instead of employing a gas as a shielding agent, the wire used is cored with a solid flux, similar in principle to an arc weldin rod.

This combination produces a hybrid that is very simple to use, fairly inexpensive and is ideal for use outside in windy conditions. Thin sheet can be welded and there is no need to keep the customary MIG gas supply. The resultant weld does however require some cleaning.

## Technical descriptions

<b>MIG Metal Inert Gas</b>	Where inert gas is used e.g. Pure Argon.
<b>MAG Metal Active Gas</b>	Where active gas is used. E.g. CO2 or Argon/CO2 Mix.
<b>MOG Metal Ohne Gas</b>	Gasless wire feed welding.

## What Gas do I use?

TYPE OF MATERIAL	GAS TO USE
Mild Steel	Argon/CO2 or Pure CO2
Stainless Steel	Argon/Oxygen or Argon/CO2
Aluminium	Pure Argon



## Gas descriptions

<b>Argon / CO2</b>	80% Argon / 20% CO2 (commonly). Giving a clean, smooth weld.
<b>100% CO2</b>	100% CO2. This gas is very cold. Therefore cools the weld pool thus requiring more welding power than when using Argon / CO2. However this gas is much cheaper than Argon CO2.
<b>100% Argon</b>	Used for aluminium. Pure inert gas giving no effect on the arc or weld pool, but acting purely as a shielding agent.