

# What Is Welding?

In a nutshell, welding is the process of uniting two or more materials together.

From the hobbyist to large industrial environments, welding is a popular manufacturing process.

Welding dates all the way back to 500BC, the Iron Age (perhaps even before that). However, the method used in those times was very simple. It was nothing but hammering together two metal pieces under heat.

The form of joining metals together we use now dates back to the 19th Century, albeit with more modern equipment and techniques.

Today, it can be used in metals, plastics and even wood. We will be focusing on metal and the techniques we use here at Varlowe Industrial Services.

## Metal Welding Meaning

Metal welding starts by heating at a high temperature using electricity or gas.

The high heat causes a weld pool of molten material that cools to form the joint.

Usually, this joint is stronger than the parent metal.

Pressure can also produce a weld and work either alongside the heat or by itself.

Shielding gas can protect the melted/filler metals from becoming contaminated or oxidised.

Welding requires lots of work and practice. Best learned under the guidance of professional metal fabricators.

Once competent, you can progress your skills by going coded. Have a look at our [“What is the meaning of “Coded Welding”](#) blog post or our [Coded Welding](#) page.

# Fabrication

Metal fabricators can transform some of the world's most robust materials into different shapes and sizes.

They produce products ranging from pipework to staircases. Or, in our case, a pipework-based staircase which you can view here ["Our signature staircase"](#).

Drilling, cutting, bending and grinding metals are techniques used to create the basic shapes.

This process gets repeated until you have something like Ikea's flat-pack furniture.

Then comes the time to apply your chosen welding technique to fuse these pieces.

There are several types of techniques, manual and automated. Each offers different ways of uniting materials together.

We will go over four types of techniques. These four are the most used methods we use at [Varlowe Industrial Services](#).

## Welding Types

There are many types of welding processes, each serving its strengths and weaknesses.

Choosing the correct technique is dependent on the project. For example, you may need specific materials and welding positions factoring in.

The correct method is essential, so it's necessary to understand the differences between them.

Today, processes can be fully automated. Equipment such as robotic welding can, within a controlled environment, deliver high quality and repeatability with ease.

Yet, some projects need expert metal fabricators to produce a type of weld in a position not compliant with automated processes.

## **MIG (Metal Inert Gas) or GMAW (Gas Metal Arc Welding)**

To Mig, or not to Mig, that is the question, which is usually yes.

This style is the most common industrial welding process.

A solid steel wire passes through the Mig Gun. The gun is electronically charged at the pull of the trigger, creating an arc, heating the two metals together.

It requires a constant voltage and direct-current power source.

**Pros** – MIG can weld in all positions – You do not have to chip off slag build-up – Its relatively easy to learn.

**Cons** – Large tank of shielding gas – the expensive cost of consumables.

## **TIG (Tungsten Inert Gas) or GTAW (Gas Tungsten Arc Welding)**

A non-consumable tungsten electrode is used in this type of welding process.

This tungsten electrode, along with shielding gas, directs the arc in a controlled manner to heat the base metal. The heat created produces a molten weld puddle.

When you need a higher standard finish, TIG is usually the go-to method. It creates a very clean weld with little to no clean up required externally or internally.

**Pros** – Used in a wider variety of materials in all positions – Provides very high-quality welds – Does not produce toxic smoke – Minimal fumes – No slag produced.

**Cons** – TIG welding is a complex process – The torch held at the right angle – More complicated to master.

## Stick Welding or SMAW (Shielded Metal Arc Welding)

Stick Welding is one of the easiest and most common types of welding.

The electrode, or “stick”, covered with a flux coating that melts to form a gas shield as the heat rises.

Slag gets created when the molten flux solidifies on the surface of the weld.

**Pros** – No other consumables needed than rods – Achievable in all positions – Equipment is simple to use and inexpensive.

**Cons** – Stick Welding has a very rough appearance – Requires extra cleaning work – Difficult to weld thinner metals.

## Electrofusion Welding

Electrofusion welding is a form of resistive implant welding used to join pipes.

A fitting with embedded metal coils is placed around two ends of the pipes. A current passes through the coils, which creates the heat required.

The heating of the coils melts small amounts of the pipe and fitting. When the joint cools, the line is fused and ready for commissioning.

**Pros** – A simple process capable of producing consistent joints – The contained process eliminates the risk of contamination – The process allows repair without the need to remove pipes.

**Cons** – More expensive method – extra parts required.

## Welding Positions

You might assume a welder sits at a workstation and fuses the metal components on a table in front of them.

But in everyday work environments, joining metal can be much trickier.

Unremovable structures attached to the ceiling, the wall or embedded into the floor offer different challenges.

They need a different method, which is why welders need techniques to weld in any position.

There are four common welding positions:

- **Flat** – As the name suggests, the metals get placed flat, and the welder passes over them. The welder will move across the workpiece in a horizontal direction.
- **Horizontal** – The weld axis is horizontal, which requires a higher level of skill. How the position passes depends on the type of weld need.
- **Vertical** – Both the weld and plate will lie vertically. One of the problems performing this weld is the molten metal flowing downward and piling up.
- **Overhead** – The overhead position weld is the most challenging position to work on. Fighting against gravity is the main issue in this position. The welder will also have to angle themselves to reach the joints.

## Fabrication Services At Varlowe

Here at Varlowe, we have been providing welding and metal fabrication services for over 17 years.

Our specialist area is in [Pipework Fabrication](#), specifically high pressure pipework systems.

We also offer a class 1 coded service for a range of applications, nationwide.

Please visit our [Welding Services](#) and our [Steel Fabrication](#) page for more details.

You can call us on **01902 861042** or email [info@varlowe.co.uk](mailto:info@varlowe.co.uk).

You can read more about the history of welding on [Wikipedia](#).