

# What is Welding?



**Welding is a way of joining pieces of metal together by heating them until they melt, using electricity or flame. Most of the modern world contains welded materials. From 'micro-joining' tiny parts in electronics and medical devices, to large scale projects like mining and constructing buildings and bridges, welding is a big part of hundreds of industries.**

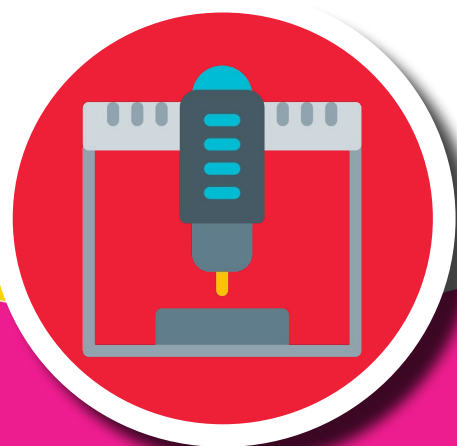
So how does it work? Welding involves constructing single parts from two components, which are joined through a heating (and in most cases melting) and cooling process, allowing them to combine and form a solid joint. Or, taking two pieces of metal, heating them to a very high temperature, and holding them together until they stick. It is the cheapest and best way to permanently join two metals. The aim is to produce a single part that is strong at every point.

Welding is a very precise skill that requires discipline and experience. It demands complete accuracy and safety, because the joints that are created through welding are used to support buildings, construct ships, and keep our appliances working properly.

## What types of materials can be welded?

Metal is the most common material to be used in welding. There are many types of metal, and welders need to know about all of them so that they can work with them safely and effectively. Some of the common metals used in welding include aluminium, cast iron, stainless steel, and titanium.

Thermoplastics are also used in welding. These are a type of plastic that become soft when heated and harden when cooled, making thermoplastics perfect for welding. They can be used to make sports equipment, toys, packaging, signage, and much more. The advantage of using thermoplastics instead of metal for certain projects is that it is more flexible and cheaper to produce.





### Types of Welds

There are lots of types of welds and welding processes. Most projects require a few, so welders need to know them all.



#### **Arc Welding**

A manual process that typically uses a filler material



#### **TIG Welding**

Used to weld most conventional metals, like aluminum and steel



#### **Friction Welding**

Typically involves mechanical friction and does not use filler metals



#### **Electron Beam Welding**

Uses a high velocity beam of electrons to connect materials



#### **Laser Welding**

An automated process used for deep welds like thermoplastics



#### **Resistance Welding**

A fast welding process used in the automotive industry

### Types of Joints

There are lots of different types of welded joints, selected based on configuration, accessibility and penetration.



#### **Butt Joint**

A connection between two ends or edges to make an angle of  $\sim 180^\circ$



#### **T Joint**

Two parts joined at a  $180^\circ$  angle with a  $90^\circ$  angle on either side



#### **Corner Joint**

The ends or edges of two parts make an angle between  $30^\circ$  and  $135^\circ$



#### **Edge Joint**

An angle between  $0^\circ$  to  $30^\circ$  is created, including the joint



#### **Cruciform Joint**

A cross-like configuration, where right angles are created



#### **Lap Joint**

Where two parts overlap and make an angle between  $0^\circ$  and  $5^\circ$

### About Weld Australia

Weld Australia is the peak body representing the welding industry in Australia. Our primary goal is to ensure that the Australian welding industry remains locally and globally competitive, both now and into the future. We are a not-for-profit, membership-based organisation.

