



## An Introduction to Arc Welding

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The most common method of fusing metals with heat today is arc welding. Arc welding is not a modern discovery per se. It might be said to date all the way back to 1800 and the first carbon electrodes.

In 1800, Sir Humphrey Davy demonstrated an arc between two carbon electrodes. The sudden surge of electricity that caused the arc created a tremendous amount of heat. It did not take long for people to realize the fact that arcs could be used to fuse metals. Arc welding history might be said to have begun with this remarkable demonstration, but it would be another 90 years before the first arc welding process was patented in the United States.

In 1890, in Detroit, Michigan, C.L. Coffin applied for a patent for an arc welding process that used metal electrodes. Prior to this time, welding was done with gas. Gas cutting and welding were widely used in many industrial applications during the entire 19th Century. The gas welding was much slower as the amount of heat was nowhere near what was possible through the arc welding process. World War I brought a tremendous surge in the demand for welding. This demand arrived at roughly the same time as the introduction of arc welding and all over the United States and Europe companies began to produce welding machines and electrodes.

In the years right after the end of the war, The American Welding Society was formed to help establish standards and to advance the craft of welding. During this period, there was a lot of controversy over the use of heavy coated electrodes vs. light coated ones. Other processes were developed during this period as well, 1920 saw the first use of automatic welding using bare wires and electrical current.

During the 1920's, which could be called the Golden Age of Arc Welding there was a great deal of research into the use of gases to shield the weld areas. The use of oxygen and nitrogen tended to produce porous and brittle welds. Research eventually led to the use of hydrogen as the shielding gas. At the same time tungsten was found to be a better material for electrodes than carbon. It would be the beginning of the modern era of welding that began with the great military buildup during the Second World War

The 1960's saw the widespread use of CO2 as the new inert shielding gas in arc welding. Plasma arc welding was invented in 1957. It involved a constricted arc or sometimes the arc was directed through a small orifice to create a plasma arc that created a much higher temperature than tungsten rod welding.

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