Contact tip

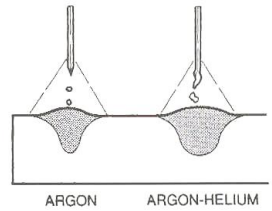
The contact tip is fitted to the end of the torch. When the wire passes through, the arc can be established provided the tip is in good condition.
More often than not, the wire burns back, it is due to incorrect setting of the tip and sticks. This leaves a deposit of welding wire attached to the contact tip, which together with spatter and wear of the tip, will cause feed problems.

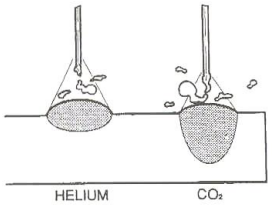
Shielding gas

When the incorrect shielding gas is used in gas metal arc welding, it results in poor welding techniques. Excessive spatter, irregularly shaped welds, porosity and "cold weld" puddles are just a few welding faults that can result.
Often after changing voltage controls, wire speeds and gas flow rates, the operator then becomes frustrated. Only then, usually in desperation, the shielding gas being used will be checked and found to be unsuitable.

Types of shielding gases

Helium, argon and carbon dioxide (usually referred to as CO_2) are the three most common shielding gases used in gas metal arc welding. These gases can be used in their pure form on some materials, pure argon is used on aluminium; or they can be a mixture, e.g. 25% CO_2 and 75% argon is used to weld low alloy steel.
With each kind and thickness of metal, each gas and mixture affects the smoothness of the operation, weld appearance, weld quality and welding speed in a different way.





AFFECTS OF INERT GAS SHIELDS DURING WELDING

Function of shielding gases

One of the basic requirements of a good weld is that it should possess the same properties as the base metal. To achieve this, the molten puddle must be completely protected from atmospheric gases such as nitrogen and oxygen during the welding process.
Without a perfectly shielded arc, these other undesirable gases are absorbed into the molten puddle, and result in weak porous welds. The gas shielded arc process completely protects the molten puddle by using a shielding gas such as helium, argon or a gas mixture.

Flowmeter

The flowmeter, attached to the gas cylinder, controls the flow rate of the shielding gas. This gas flow is in turn governed by the atmospheric conditions. In still conditions the gas flow rate can be reduced, but if there is a breeze then the gas needs to be increased to protect the weld puddle. The flow rate is normally around 10–14 litres per minute.