

Description

Image



Image caption

(1) Oxy-acetylene welding © Marco d'Itri at Wikimedia Commons (CC BY 2.0) (2) Trainees watching an instructor using the oxyacetylene burner for cutting metal at a training establishment at Plymouth. The Royal Navy during the Second World War © Admiralty Official Collection at Wikimedia Commons [Public domain] (3) Hull maintenance technician who is responsible for the upkeep of hulls, fittings, piping and machinery. © U.S. Navy at Wikimedia Commons [Public domain]

The process

OXYACETYLENE WELDING is the oldest of all welding processes. An oxyacetylene weld is produced by heating with a flame obtained from the combustion of oxygen and acetylene. Three types of flames can be obtained: reducing, neutral and oxidizing flames. The neutral one (equal proportions of oxygen and acetylene) is the most widely used. The reducing flame has excess acetylene and is used in welding Monel metal, nickel, certain alloy steels and non-ferrous metals. An oxidizing flame (with excess oxygen) is used for welding brass and bronze. Oxyacetylene welding has been replaced in many applications by arc welding.

Process schematic

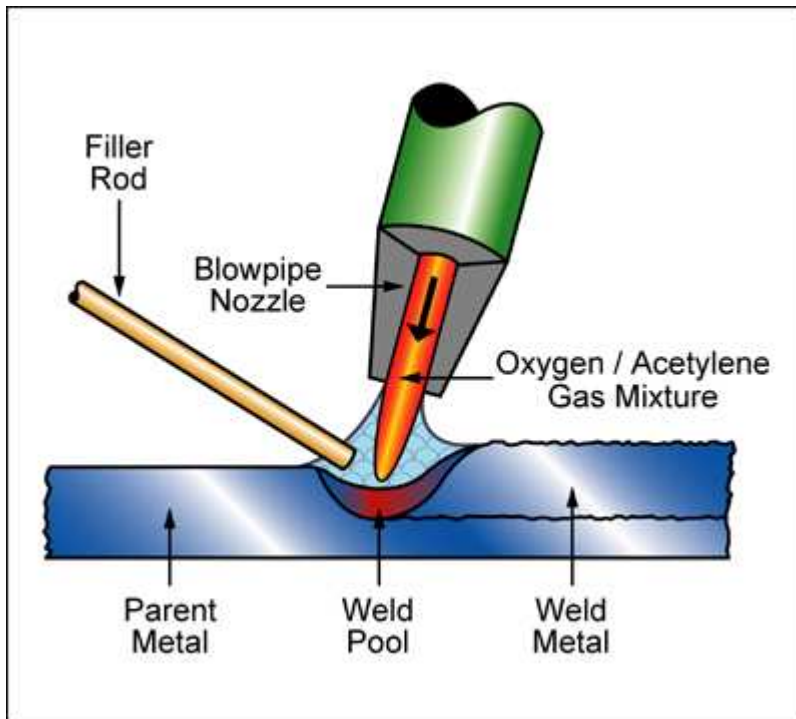


Figure caption

Oxyacetylene welding.

Material compatibility

Metals - ferrous	✓
Metals - non-ferrous	✓

Function compatibility

Electrically conductive	✓
Thermally conductive	✓
Watertight/airtight	✓
Demountable	✗

Joint geometry compatibility

Lap	✓
Butt	✓
Sleeve	✓
Scarf	✓
Tee	✓

Load compatibility

Tension	✓
Compression	✓
Shear	✓
Bending	✓

Torsion	✓
Peeling	✓

Economic compatibility

Relative tooling cost	low
Relative equipment cost	low
Labor intensity	medium

Physical and quality attributes

Range of section thickness	1 - 6 mm
Unequal thicknesses	✓
Processing temperature	800 - 1.5e3 °C

Process characteristics

Discrete	✓
Continuous	✓

Supporting information

Design guidelines

All weld geometries are possible -- the process is a flexible one -- but butt welds are the most straightforward. The equipment is cheap and portable, giving it wide used.

Technical notes

Excellent control of the process is possible -- a skilled welder can make welds in all welding positions. Oxyacetylene welds are possible with most metals except the refractory metals such as tungsten. It is most commonly used for cast irons and steels.

Typical uses

Oxyacetylene welding is used for fabrication and repair of a wide range of metals.

The economics

The equipment, tooling and consumable costs are low. Skill is required to produce a sound weld, but the training is widely available.

The environment

Face shields, gloves and good ventilation are important to avoid

Links

MaterialUniverse

Reference