Description

Image

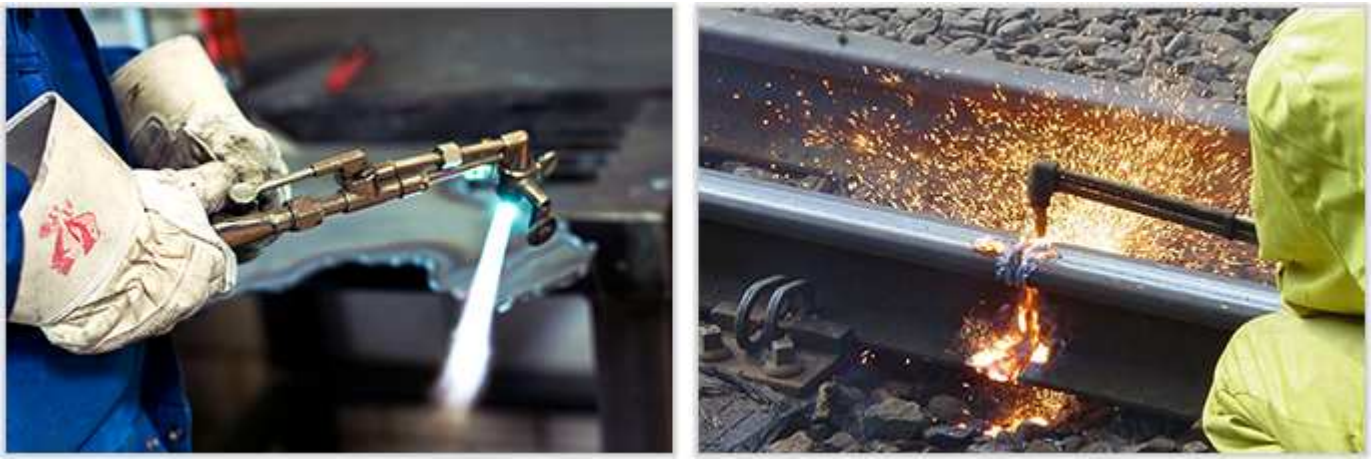

Image caption

(1) Oxy-fuel cutting © Jonas Boni at Wikimedia Commons (CC BY 2.0) (2) Cutting a rail just before renewing the rails and the ballast © Skatebiker at Wikimedia Commons [Public domain]

The process

OXYFUEL GAS FLAME CUTTING is a metal cutting process in which a gas flame heats the surface to a sufficient temperature to trigger exothermic oxidation of the metal, sustained by an oxygen stream injected into the center of the flame. Thick plate can be cut.

Process schematic

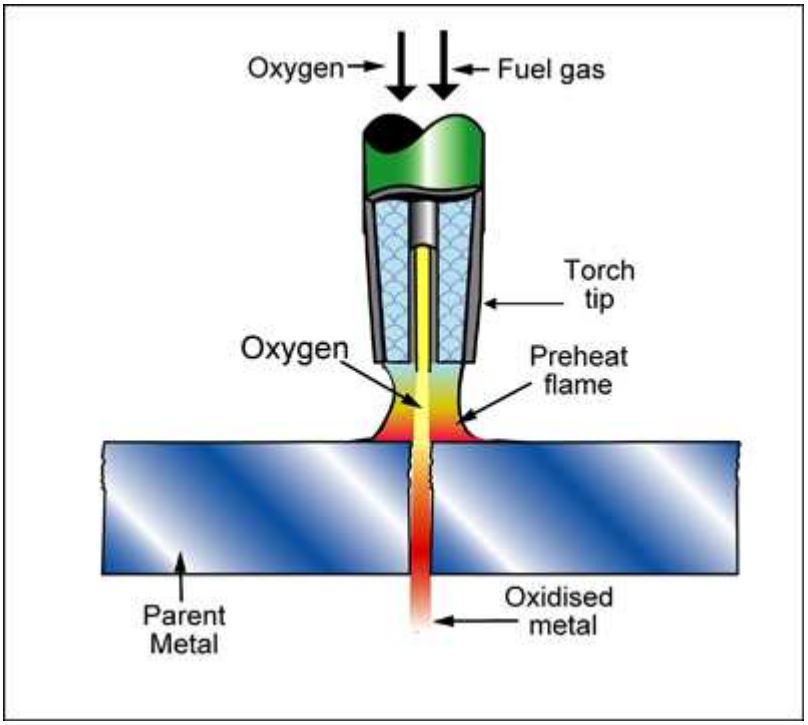

Figure caption

Flame, or oxy-fuel gas cutting.

Tradenames

Oxy-fuel cutting, OFC

Material compatibility

Metals - ferrous	✓
Metals - non-ferrous	✓

Shape

Flat sheet	✓

Economic compatibility

Relative tooling cost	low			
Relative equipment cost	low			
Labor intensity	medium			
Economic batch size (units)	1	-	1e6	

Physical and quality attributes

Range of section thickness	315	-	1.18e4	mil
Tolerance	39.4	-	118	mil
Roughness	0.248	-	3.15	mil
Surface roughness (A=v. smooth)	C			
Cutting speed	0.00394	-	1.97	in/s
Minimum cut width	118	-	197	mil

Process characteristics

Primary shaping processes	✗
Machining processes	✓
Cutting processes	✓
Discrete	✓

Supporting information

Design guidelines

OFC used for cutting steel, cast iron and cast steel. Other iron-base alloys and some nonferrous metals can be flame cut, although process modification may be required. Generally the effectiveness of flame cutting decreases as carbon increases. Distortion is severe in plate thinner than 8mm.

Technical notes

Cutting occurs by a combination of oxidation and melting.

Typical uses

Cutting plate for shipbuilding, structural fabrication, manufacture of earthmoving equipment, machinery construction, fabrication of pressure vessels and storage tanks.

The economics

OFC is more economic than other forms of cutting for thick

Links

MaterialUniverse

Reference