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PLASMA vs OXY-CUTTING

Choose the best cutting process



Plasma cutting is one of the most widely used processes in metallurgy and machining. Its cutting speed and precision often give it an edge over the historically more widespread oxycutting process.



OXYCOUPAGE technology

The equipment is simple and the operator can be quickly ready. However, this process is rather slow and is only suitable for cutting carbon steel. Oxygen is not effective on other types of metals such as stainless steel or aluminum. In addition, the part to be cut must be preheated before cutting, which further reduces productivity. Safety issues arise from the use of acetylene, which is highly flammable and unstable (this combustible gas is most commonly used with oxy-fuel cutting).

Main uses and applications

- Cutting steel for fabrication or dismantling
- Heating parts for bending, straightening, heat treatment.
- Loosen jammed/rusted parts and bolts (oxyacetylene can loosen rusty nuts from a bolt without damaging it).

PLASMA technology

Created by the electrical charge of a gas, plasma produced with compressed air can cut metals up to a thickness of 62 mm. GYS systems are portable and easy to use, with higher cutting speeds than flame cutting. In addition, the ability to cut a wide variety of conductive materials allows excellent versatility (steel, stainless steel, aluminium).

Main uses and applications

- Cutting of various conductive materials, including mild steel, carbon steel, stainless steel, aluminum, copper, brass and other ferrous materials.
- Straight / chamfered cut
- Automated cutting
- Gouging
- Drilling
- Thin cutting

	OXYCUTTING	PLASMA CUTTING
Material(s)	Carbon steel only	Most conductive metals
Thickness	Thickness range	Up to 62 mm
Cutting quality	Quality ranging from very good to bad depending on the operator	Good quality, may require some secondary operations
Productivity/Speed	Weak, can be improved by using several torches simultaneously	Average
Secondary operations	Grinding and oxidation removal of the surface almost always necessary	Grinding sometimes necessary
Operating cost	€€	€
Equipment cost	€	€€
Portability	Yes	Yes
Gouging	No	Yes
Safety	-	+

4 reasons why plasma cutting replaces flame cutting:



Better cutting quality: plasma cuts produce less slag (burrs).



Easier to use: no gas to regulate, no flame chemistry to control.



Cuts more parts, faster and with fewer secondary operations.



Uses only air for greater safety, no flammable gas required.

Oxycutting / Plasma Study

Cost for 1 min. of use

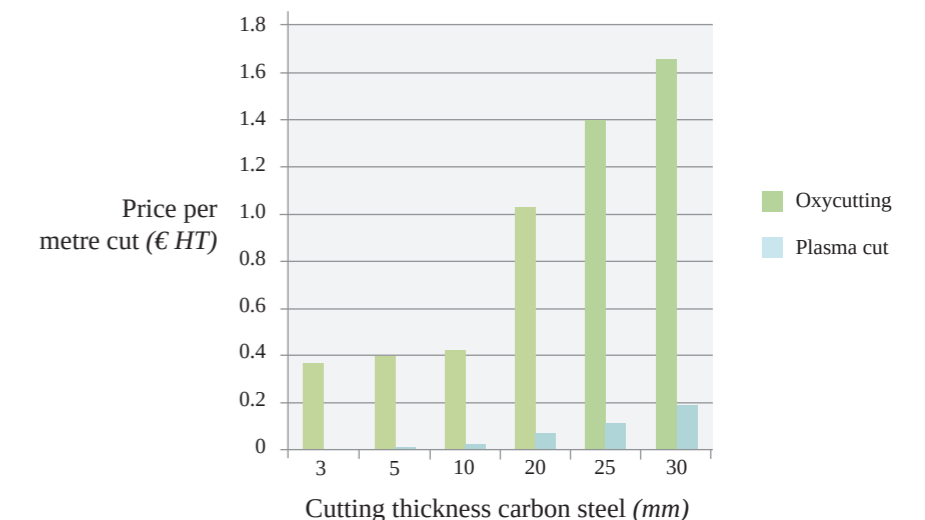
OXYCUTTING			
Oxygen price OX / litre (€ HT)	0.012		
Price of acetylene AD / litre (€ HT)	0.04		
Torch nozzle	7/10	10/10	12/10
Consumption in litres OX/h	1100	2200	3000
Consumption in litres AD/h	150	200	300
Cost for 1 min. of use	0.30 € HT	0.53 € HT	0.74 € HT

PLASMA CUTTING		
Price per kWh 2019 (€ HT)	0.09	
Power consumption (kW)	20	30
Amperage used (A)	85	125
Cost for 1 min. of use (€ HT)	0.03	0.04
Cost of m ³ of air (€ HT)	0.06	
Air consumption (m ³ /min)	0.27	
Cost for 1 min. of air flow (€ HT)	0.016	
Cost for 1 min. of use (compressor + Plasma Cutter)	0.043 € HT	0.056 € HT

Price per metre cut € HT

OXYCUTTING						
Thickness to be cut	3 mm	5 mm	10 mm	20 mm	25 mm	30 mm
Torch nozzle	7/10	7/10	7/10	10/10	12/10	12/10
Cutting speed (cm/min)	80	75	70	52	53	45
Time (min/m)	1.25	1.33	1.43	1.92	1.89	2.22
Price per metre cut (€ HT)	0.37	0.39	0.42	1.03	1.40	1.65

PLASMA CUTTING						
Thickness to be cut	3 mm	5 mm	10 mm	20 mm	25 mm	30 mm
Nozzle (A)	85		125			
Cutting speed (cm/min)	680	350	168	80	50	30
Time (min/m)	0.15	0.58	0.60	1.25	2	3.33
Price per metre cut (€ HT)	0.006	0.012	0.025	0.07	0.11	0.19



THREE-PHASE PLASMA cutter

GYS plasma systems meet most of the requirements cutting applications.



CUTTER 70 CT



Capacity	Thickness (mm)	
	Iron	Alu. / Cuivre
Separation	35	25
Clean cut	25	18
Piercing	15	12
Gouging	-	

	I ₂	X (40°C)		
400 V - 3 ~	20 - 70 A	70 A @ 60%	52 x 40 x 26 cm	22 kg

CUTTER 85 A TRI



Capacity	Thickness (mm)	
	Iron	Alu. / Copper
Separation	40	30
Clean cut	30	25
Piercing	18	15
Gouging	-	

	I ₂	X (40°C)		
400 V - 3 ~	25 - 85 A	85 A @ 60%	62 x 44 x 30 cm	32 kg

CUTTER 125 A TRI



Capacity	Thickness (mm)	
	Iron / Alu. / Copper	
Separation	62	
Clean cut	40	
Piercing	25	
Gouging	12 kg/h	

	I ₂	X (40°C)		
400V - 3 ~	25 - 125A	125 A @ 100%	71 x 49 x 31 cm	40 kg

“Ready to cut” packages

		Connections		4 m		6 m		12 m		Automatic	CNC kit	Trolley	Consumables
		8 mm	10 mm	10 mm ²	16 mm ²	6 m	12 m	6 m	12 m				
CUTTER 70 CT	M2 014589					•							• 037540
	M3 014596	•	•	•			•				•		• 037540
	A 014619								•		•		
CUTTER 85 A TRI	M1 029996									•			
	M2 029828									•			• 039537
	M3 029835	•	•	•								•	• 039537
	A 029842										•		
CUTTER 125 A TRI	M1 029910									•			
	M2 029859									•			• 039544
	M3 029866	•	•		•							•	• 039544
	A 029873										•		

Created in 1964, GYS is a French family group with 630 employees worldwide. With its research centre, GYS is a leading player in the design and manufacturing of welding, battery charging and car-body repair equipment.

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