

NERTAJET HP

New
CPM 360

Automatic plasma arc cutting
of all ferrous and non-ferrous metals.

OCP 150
0409-2405



PLASMA process

The term **PLASMA** generally applies to ionised gaseous media with temperatures in excess of 3000 °C at atmospheric pressure. In the temperature scale, this can be considered to be the fourth state of matter, after the solid, liquid and gaseous states. For some thirty years or so, the word **PLASMA** has been used to define the high state of energy caused when a nozzle is used to constrict an electrical arc.



This principle is used increasingly in industry for cutting and welding ferrous and non-ferrous metals.

Air Liquide Welding is a world leader in implementing the plasma process.

For cutting, Air Liquide Welding has developed:

- ZIP and PRESTOZIP manual sets,
- NERTAJET HP and ZIP automatic sets.

As always, since the creation of the NERTAJET plasma cutting range in 1960, our equipment has been constantly developed and we make a continuous effort to market the most suitable products for meeting manufacturers' quality and productivity needs.

NERTAJET HP automatic plasma arc cutting installations are a source of progress, innovation, competitiveness and quality that Air Liquide Welding is making available to the industry of today and tomorrow.

The alternative to laser cutting

Hyper Polyvalence: usable in all industries cutting ferrous and non-ferrous metals.

High Performance: maximum usable combinations.

High Precision: with PLASMATOME HP machines.

High Productivity: simple, automated operation, high speed cutting and two-torch option.

High Protection:

- of electronic and computer equipment, through elimination of HF arc striking
- of the environment, through the possibility to cut under water using the water vortex process.



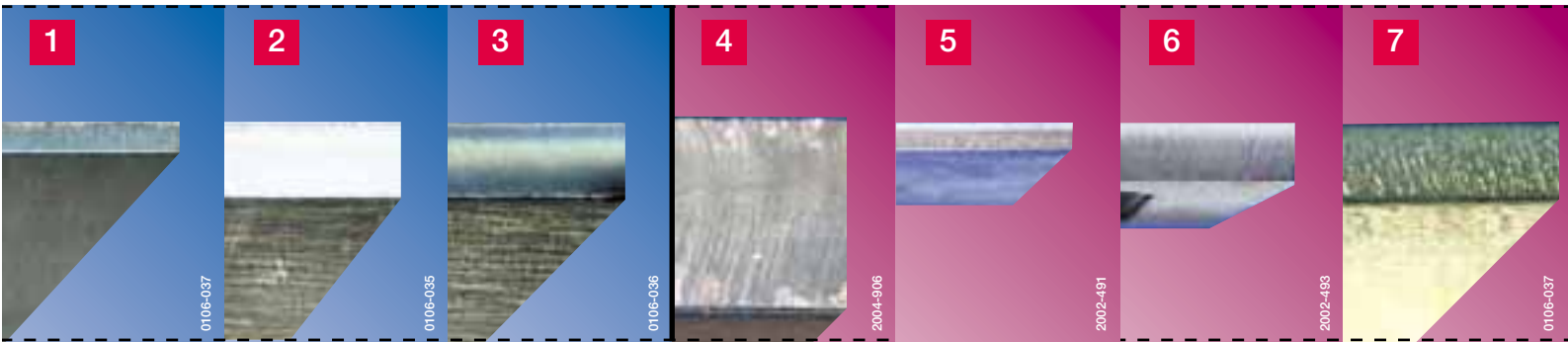
Hyper Polyvalence of applications



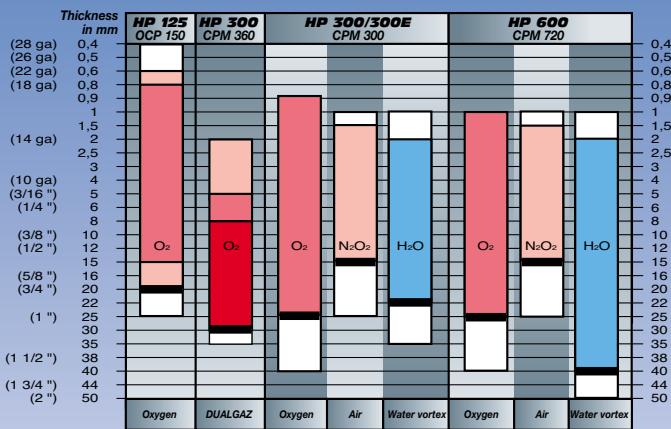
NERTAJET HP **High Plasma Activity sectors:**

- general cutting, shipbuilding, railroad rolling stock, road vehicles, agriculture, agrifoods, ventilation and air conditioning, sheet metalwork, pattern cutting, street furniture, lamp posts, etc
- non-ferrous metals such as aluminium and aluminium alloys, stainless steel, copper and copper alloys, titanium, etc
- ferrous metals such as carbon steel, coated carbon steel (pre-painted, galvanized, zinc-plated, etc), high yield strength steel, cast iron, etc...

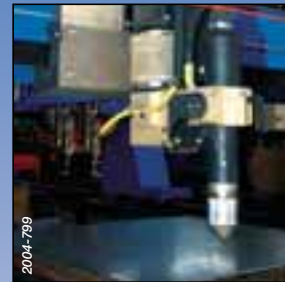
Hyper Polyvalence of materials



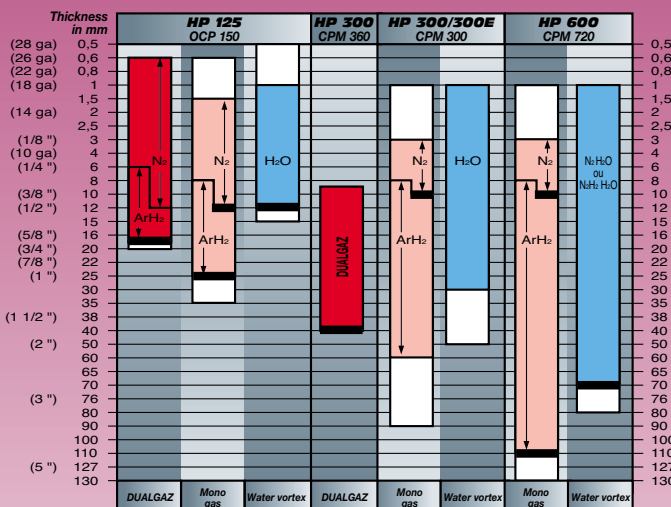
Non-alloy and low-alloy steels



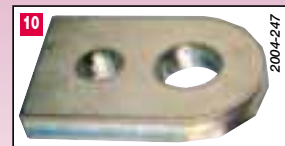
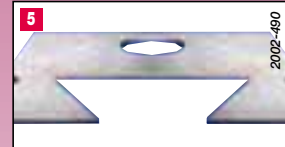
	Thickness mm	Gas	Current A	Speed m/min.
1	4	oxygen	60	3.0
2	10	oxygen	90	1.8
3	10	nitrogen + water vortex	500	3.0
4	25	oxygen + air	260	1.4



Stainless steels



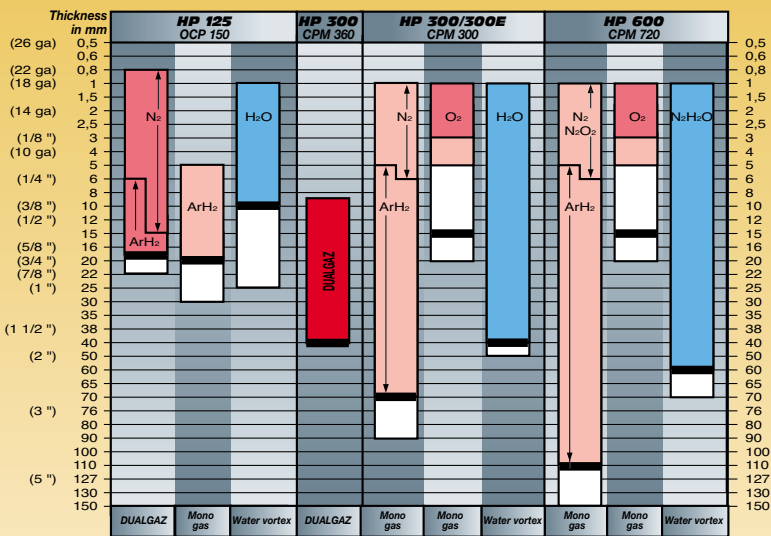
	Thickness mm	Gas	Current A	Speed m/min.
5	3	DUALGAZ N ₂ /N ₂ +O ₂	60	2.4
6	6	DUALGAZ N ₂ /N ₂ +O ₂ +CH ₄	90	1.2
7	10	nitrogen + water vortex	500	3.0
8	10	nitrogen + water vortex	120	1.5
9	10	argon/hydrogen	120	0.9
10	15	DUALGAZ Ar/H ₂	120	0.75



Ranges of usable installations

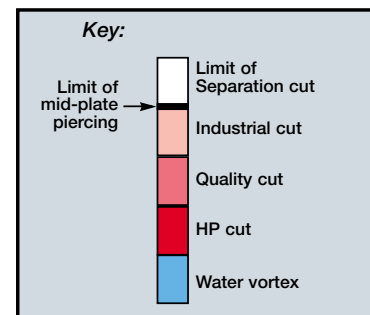


Aluminium and aluminium alloys



	Thickness (mm)	Plasmagas	Current A	Speed m/min.
11	10	argon/hydrogen	120	1.9
12	10	nitrogen + water vortex	120	1.4
13	10	nitrogen + water vortex	500	3.0
14	25	argon/hydrogen	400	1.2

O_2 = Oxygen
 N_2 = nitrogen
 $N_2 O_2$ = industrial air
 $Ar H_2$ = argon - hydrogen



Nota : the surface condition varies as a function of the grades of materials employed.

High Precision, High Productivity



NERTAJET HP plasma cutting process occupies the middle ground between oxycutting and laser cutting processes in terms of plant investment, thickness of material to be cut and cutting quality. On the other hand, the high cutting speeds obtained guarantee the lowest operating costs (price per metre cut)..

The High Performance of plasma arc machining using NERTAJET HP installations stems from:

- the wide choice of powers (currents), providing the best match between the thickness of the material and the required cutting quality,
- a wide choice of plasma arc processes (utilised gases), providing the best match between the nature of the material to be cut and the required cutting quality,
- the fact that the same NERTAJET HP installation lets you work:
 - either in the conventional way (very high cutting speed),
 - or in the High Plasma mode (high cutting accuracy).



The High Plasma NERTAJET HP is a development of the standard plasma arc process representing an alternative to laser cutting:

• in quality and productivity

This cutting tool ensures:

- good metallurgical, dimensional and geometry of cut parts,
- high quality of cut face surfaces,
- cuts free of adhering drosses,

• in productivity

- possibility of setting electrical power according to speed required for each thickness,
- possibility of combining several NERTAJET HP plasma sets,
- possibility of combining several speed ranges on the same geometry with HPC DIGITAL PROCESS control,
- possibility of combining cutting and marking operations with torch OCP 150, CPM360 with HPC DIGITAL PROCESS control.

- possibility of automatically managing cutting parameters with HPC DIGITAL PROCESS control.

• in operating cost

With NERTAJET HP installations, everything contributes

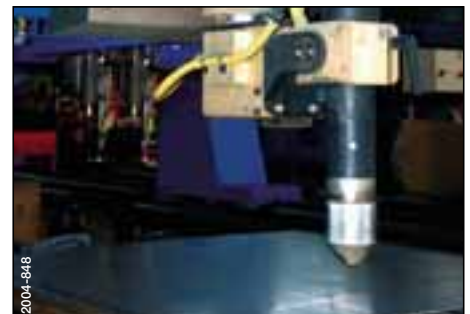
to an economic cutting price:

- increased service life of consumables,
- low gas consumption,
- cutting with multiple NERTAJET HP plasma arc installations example: two-torch, simultaneously (productivity) or sequentially (quality).

**New
CPM 360**

Cutting thick alloyed steels

With NERTAJET HP / CPM 360 plasma, Air Liquide Welding offers you a high-quality solution for cutting alloyed steels 10 to 30 mm thick (low clearance, no burrs, high cutting speed depending on carbon steels and part geometry).



The alternative to laser cutting



In contrast to Laser cutting, the plasma cutting process is able to cut greater thicknesses of stainless steel than of non-alloy steels at a given power (for example, at 120 amperes, it is possible to cut up to 20 mm of non-alloy steel, but as much as 35 mm of stainless steel).

Integrated plasma marking

With NERTAJET HP 125/OCP 150 plasma and HP300 / CPM360, you can combine plasma marking and cutting operations. This new system combined with HPC process control allows marking and cutting operations to follow on automatically using the same wearing parts (electrodes, nozzles). This automatic management of the two processes considerably improves the productivity of the sets and allows marking depth and speed to be easily modified.

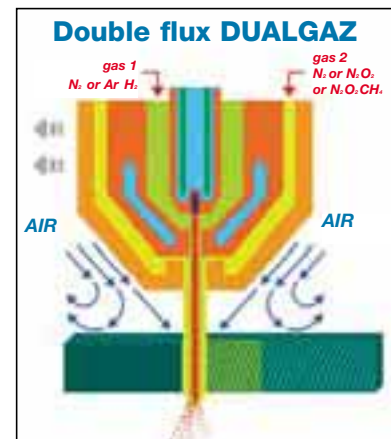


thickness 3 mm - Argon - 12 A
speed 2.5 m/min.

Cutting stainless steel

With the NERTAJET HP DUALGAZ plasma process, Air Liquide Welding brings you a high quality solution for cutting stainless steels in thicknesses from 0.8 to 18 mm.

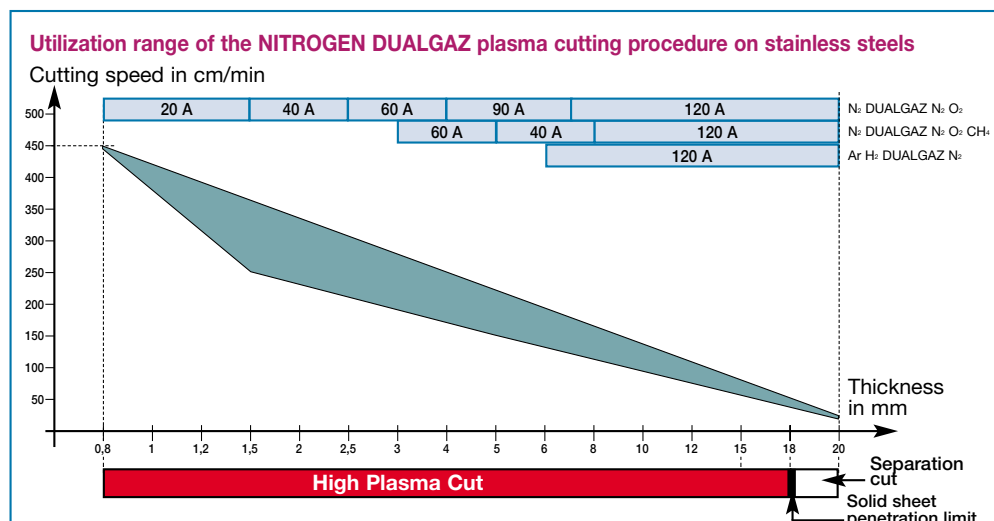
DUALGAZ is a new technology successfully developed by Air Liquide Welding engineers, bringing to bear their profound knowledge of every aspect (the electronics, mechanics, gaseous physics and chemistry, metallurgy, etc.) of the plasma procedure.



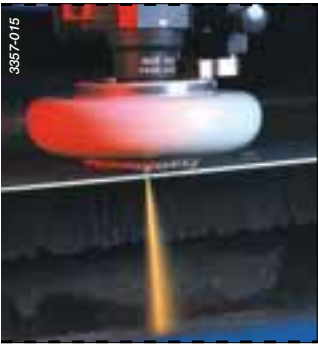
Advantages to customers

- **Flexibility:** DUALGAZ is suitable for all grades of stainless steel, including titanium stabilized grades.
- **Quality:**
 - no flashes, even in zones where the machine slows down (angles, etc.) Cut parts can be used directly without any retouching.
 - low surface roughness (less than that obtained by Laser cutting).
 - light colour of cut surfaces.
 - very good control of relief.
- **Reproducibility:** excellent consistency of cut throughout the life of wearing components (nozzles and electrodes).

- **Ease of use:** can be employed on all common digitally controlled gantry machines. Its use on high precision equipment such as ALPHATOME, displays the potential of the procedure to the full (high quality geometry of parts).



A reliable technology, easy to use, reducing



1 The NERTAJET HP autonomous cycle is the “intelligence” of the plasma arc installation. To use a musical analogy, it is the conductor of all the orchestral players implementing the plasma arc cutting process: installation components, machines, operators.

It is characterized by:

- a single mode of operation throughout the range of NERTAJET HP installations.
- customizing to suit the application through the facility to store cutting parameters.
- very safe to control, favoured by:
 - a design enabling the autonomous cycle to be integrated into the control console of the machine so that the operator has a direct view of the cutting process and parameters.
 - availability and front panel display of the autonomous cycle and hence all functions necessary and useful for control and maintenance of the installation.
- open-ness to modern communications - facilitating the updating of plasma arc process control software and cutting parameters.
 - meeting future needs for integration (multitorch, remote diagnosis, etc).

2 NERTAJET HP are direct current electrical power supplies.

They are equipped with microprocessor-chopper type electronics. This enables them to react as quickly as the cutting to guarantee a totally stable current output.

Power sources	Cutting intensity
HP 125	15 - 120 A
HP 300	30 - 300 A

3 The fluids control unit provides remote control and close regulation of the plasma gases as close as possible to the torch.

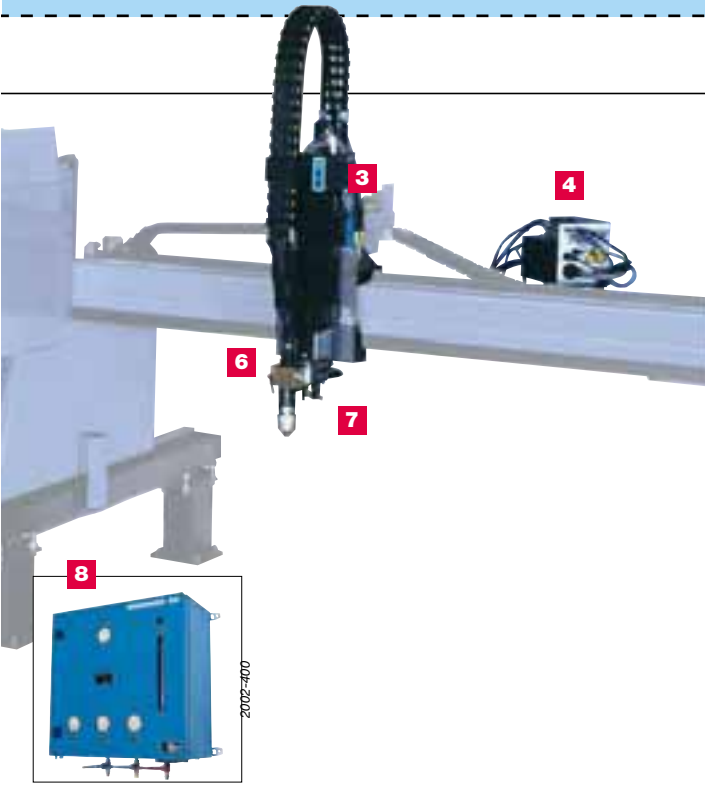
4 The torch connecting module interconnects the torch and the plasma installation.



5 FRIOJET refrigeration units are used for closed-circuit cooling of the cutting torch.

The guaranteed stability of the cooling liquid temperature means constant production quality and significantly increases the service life of torches and consumables.

	Cooling power	Application
FRIOJET 10	1000 W	HP 125
FRIOJET 25	2500 W	HP 250 / HP 300
FRIOJET 60	6000 W	HP 600



7 At your service, two ranges of torches:

- CPM, conventional torches using HF striking of the pilot arc,
- OCP, High Plasma torches:
 - high productivity combined with precise and good quality cut faces through very tight constriction of the plasma arc,
 - high protection of the environment against electromagnetic interference by non-HF pilot arc striking (patented),
 - hyper polyvalence of maintenance, replacement of consumables and change of process are facilitated by a patented removable torch body design.

6 The tool-holder is the Z axis necessary for precise and fast vertical movement when cutting materials of varied kinds and thicknesses.

It carries out the vertical positioning and ensures that the torch - to - workpiece distance is kept constant without any mechanical contact.

Tool-carrier	Stroke	Application
PO 251 POC 250	250 mm	Universal, mandatory for submerged water vortex
POC 101	100 mm	High-precision machines
POC 50	50 mm	Robots

8 MIXOJET gas mixers are devices designed for the supply of gas mixture (binary or ternary) to the plasma apparatus. Dynamic production of the gas mixture means that no buffer capacity is required. With the pneumatic control system, all need for electrical energy is eliminated.

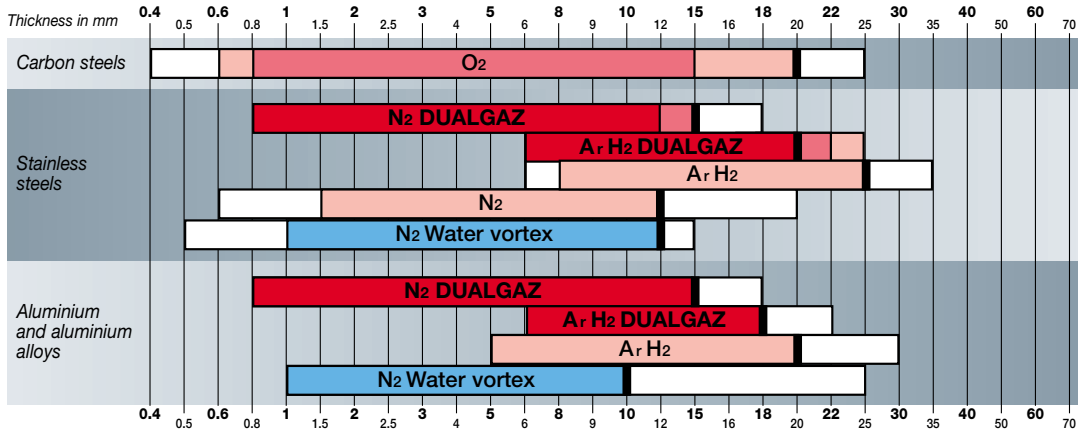
	Type	Gas
MIXOJET 20	Binary	Ar + H ₂ N ₂ + H ₂
MIXOJET 30	Binary and ternary	N ₂ + O ₂ N ₂ + O ₂ + CH ₄

Possibilities of installations

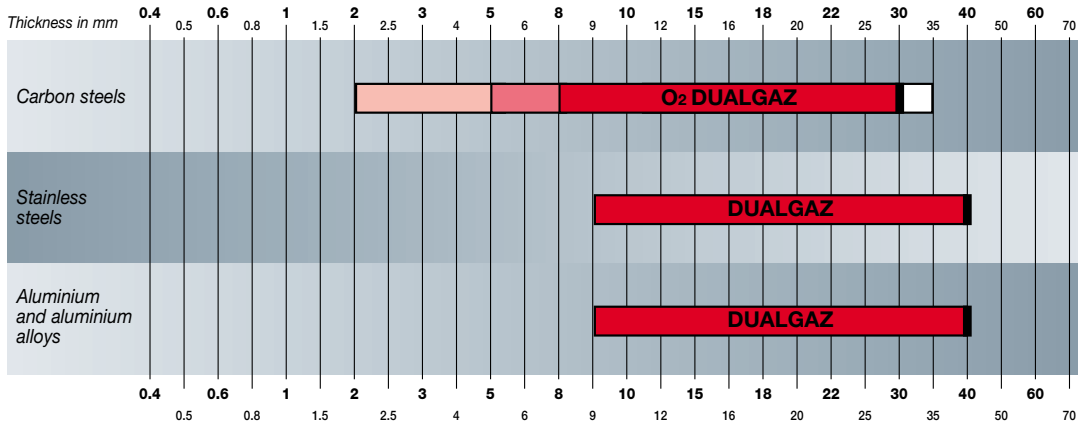


Conform to EU standards.
 Multivoltage : 230 V - 400 V - 440 V - three-phase
 and multifrequency : 50 Hz and 60 Hz.

NERTAJET HP 125-OCP 150



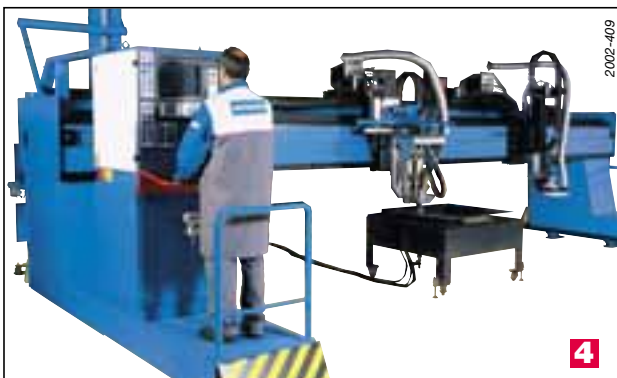
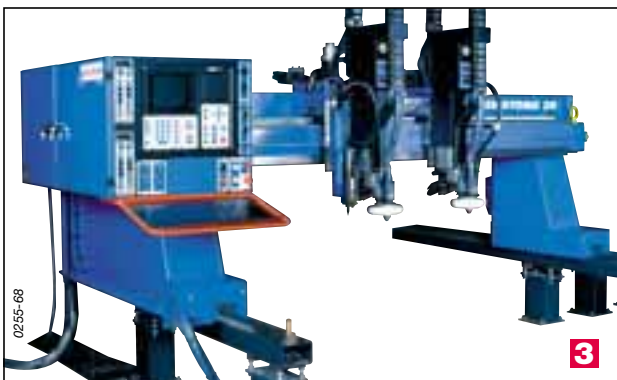
NERTAJET HP 300-CPM 360



Air Liquide Welding solution for autom

NERTAJET HP automatic plasma arc cutting installations are:

- either autonomous, for use in any mechanical system that can track correctly at the recommended speeds,
- or integrated into Air Liquide Welding machines of the following types:
 - OPTITOME, OXYTOME and OXYTOME HPC (dual process: oxycutting + plasma arc cutting),



The performance available from NERTAJET HP installations stems from:

- the diversity of applications for each installation,
- the precision and ergonomic design of the machines,
- Air Liquide Welding complete mastery of all aspects of the equipment:
 - plasma installation,
 - machine,
 - site-cutting tables,
 - fume extraction,
 - CAM (computer-aided manufacturing) software.

1 OPTITOME/NERTAJET HP 125

2 OXYTOME 25 HPC/NERTAJET HP 125/OPC 150/HPC DIGITAL PROCESS

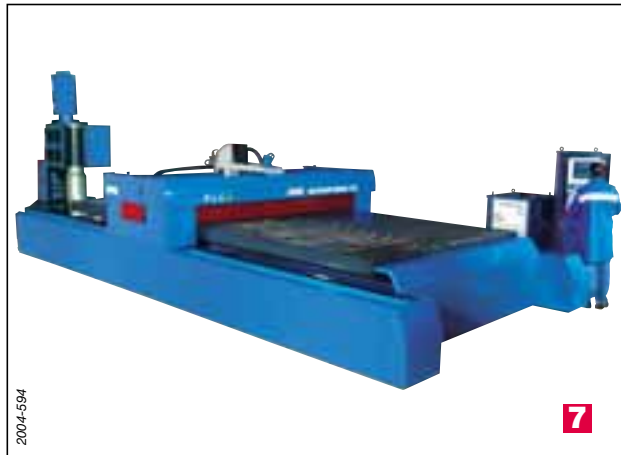
3 PLASMATOME/ Two-torch NERTAJET HP 125

4 CYBERTOME/ Two-torch NERTAJET HP 600/ Beveling device

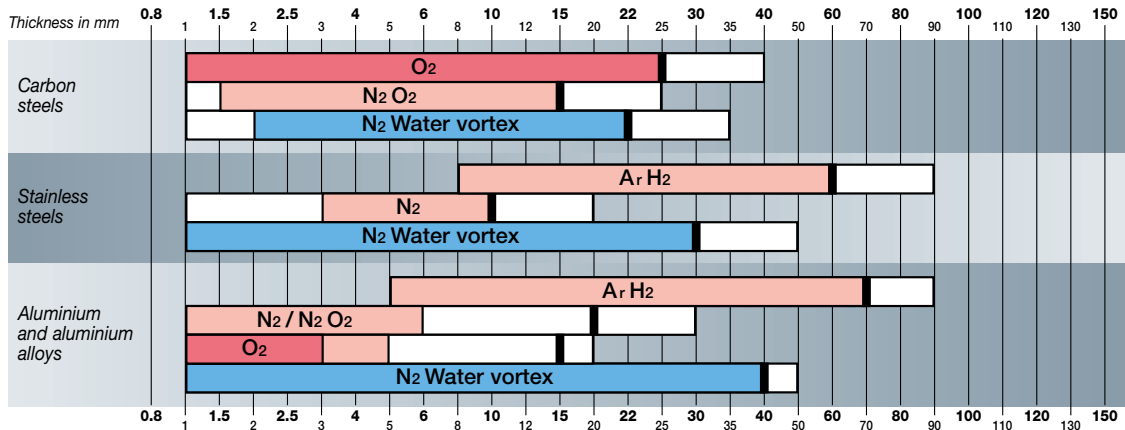
atic plasma arc cutting

- PLASMATOME and ALPHATOME (single-process: single-torch or two-torch plasma arc cutting),
- OXYTOME RS and CYBERTOME (single-process: singletorch or multitorch plasma arc cutting; dual process: oxycutting + plasma arc cutting).

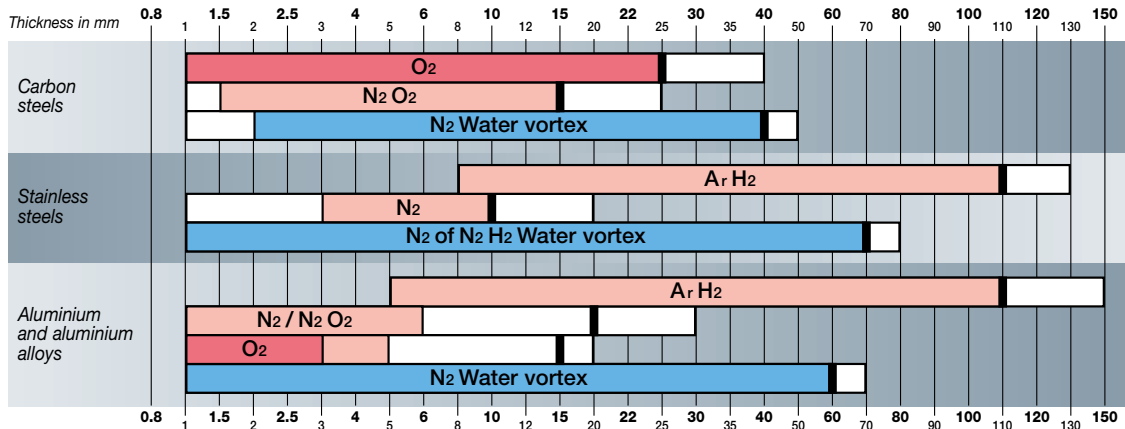
- 5** Robot/NERTAJET HP 125
- 6** PLASMATOME/NERTAJET HP 300
- 7** ALPHATOME 25/NERTAJET HP 125/OCP 150/
HPC DIGITAL PROCESS
- 8** PLASMATOME/Two-torch NERTAJET HP 300
- 9** X-TOME/Two-torch NERTAJET HP 125 and oxycutting



NERTAJET HP 300 - CPM 300 and NERTAJET HP 300E - CPM 720

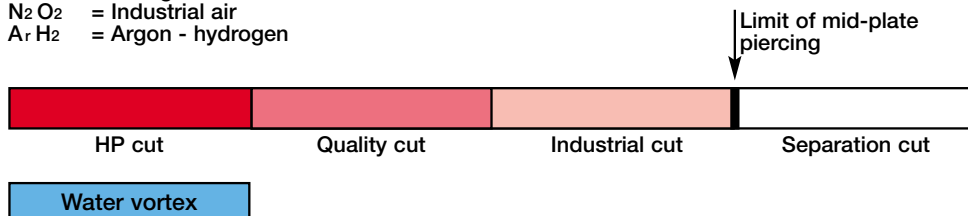


NERTAJET HP 600 - CPM 720



Key:

- O₂ = Oxygen
- N₂ = Nitrogen
- N₂ O₂ = Industrial air
- Ar H₂ = Argon - hydrogen





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