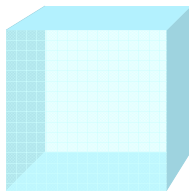


PLASMA CUTTING TECHNOLOGY / LE COUPAGE PLASMA



SOLIDE
SOLID



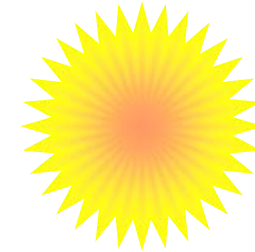
LIQUIDE
LIQUID



GAZEUX
GASEOUS



PLASMA
PLASMA



ENERGIE **ENERGY**



I) PRESENTATION DU PROCEDE PLASMA

II) PERFORMANCES ET LIMITES DU PLASMA

III) HISTORIQUE DU COUPAGE PLASMA

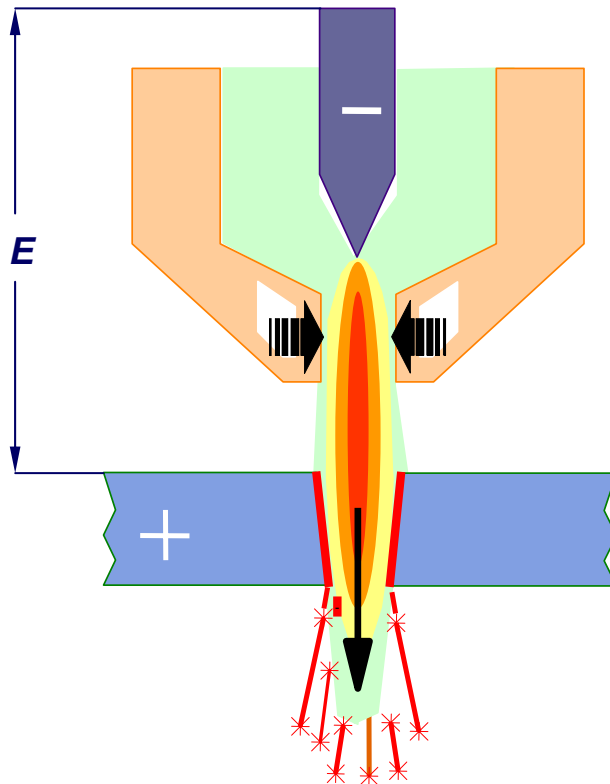
IV) COMPARAISON AVEC D'AUTRES PROCEDES DE DECOUPE

V) PRESENTATION DES MACHINES

VI) LE MARCHE DE LA DECOUPE PLASMA

PRESENTATION DU PROCEDE PLASMA

tuyère énergiquement refroidie = constriction de la colonne d'arc plasma
nozzle energetically cooled = constriction of the arc plasma jet
température au cœur de l'arc (15 000 à 30 000 °C) = fusion du métal
temperature in the arc core = melting of the metal
vitesse élevée du jet plasma ($> M 1$) = expulsion du métal hors de la saignée
high speed of the plasma jet = ejection of the melted metal out of the kerf



IONISATION DU GAZ GAS IONISATION

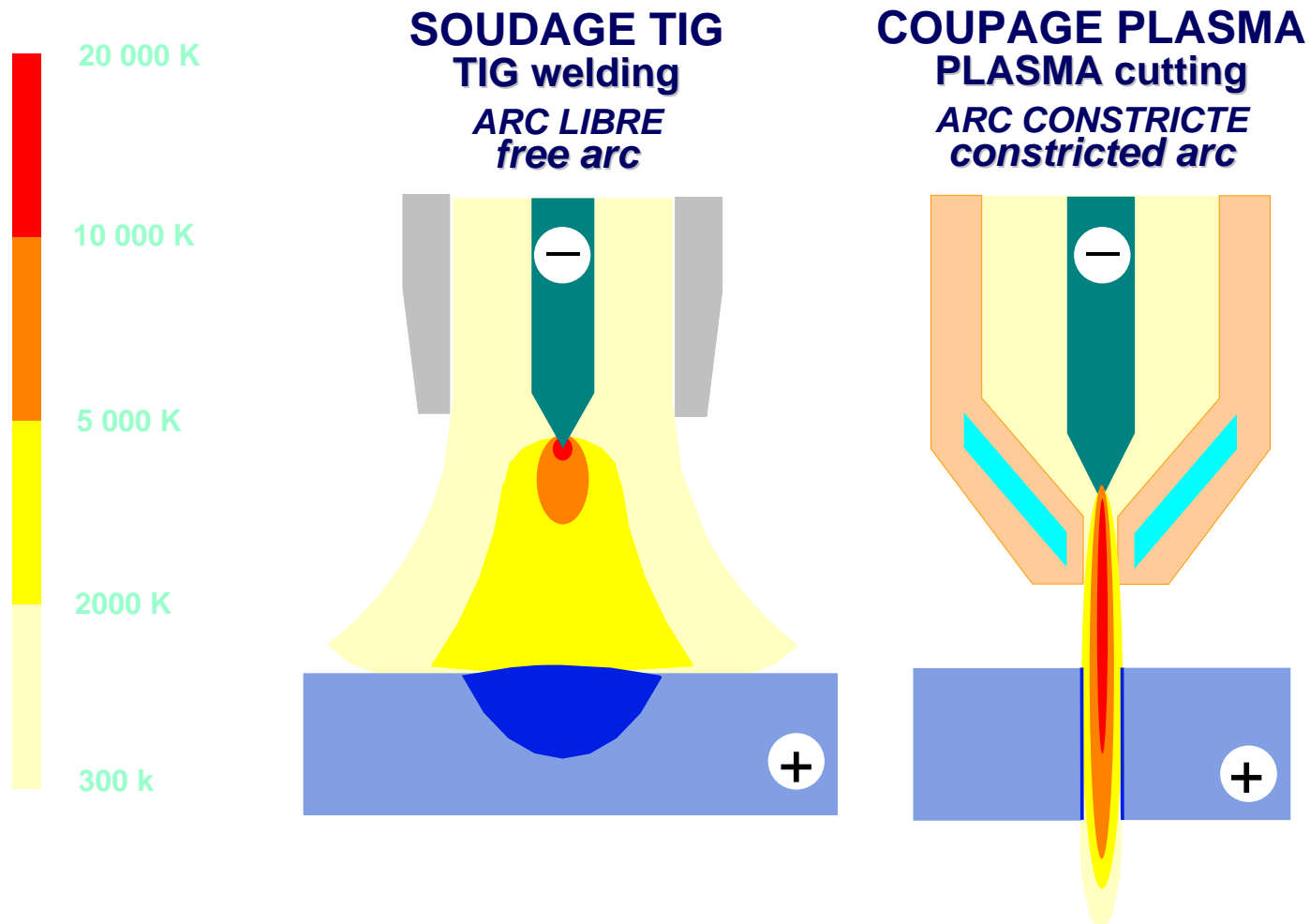
ARC ELECTRIQUE ELECTRIC ARC

CONSTRICTION CONSTRICTION

ENERGIE THERMIQUE THERMIC ENERGY
ENERGIE CINETIQUE KINETIC ENERGY

FUSION & EXPULSION DU METAL
MELTING & EJECTION OF THE METAL

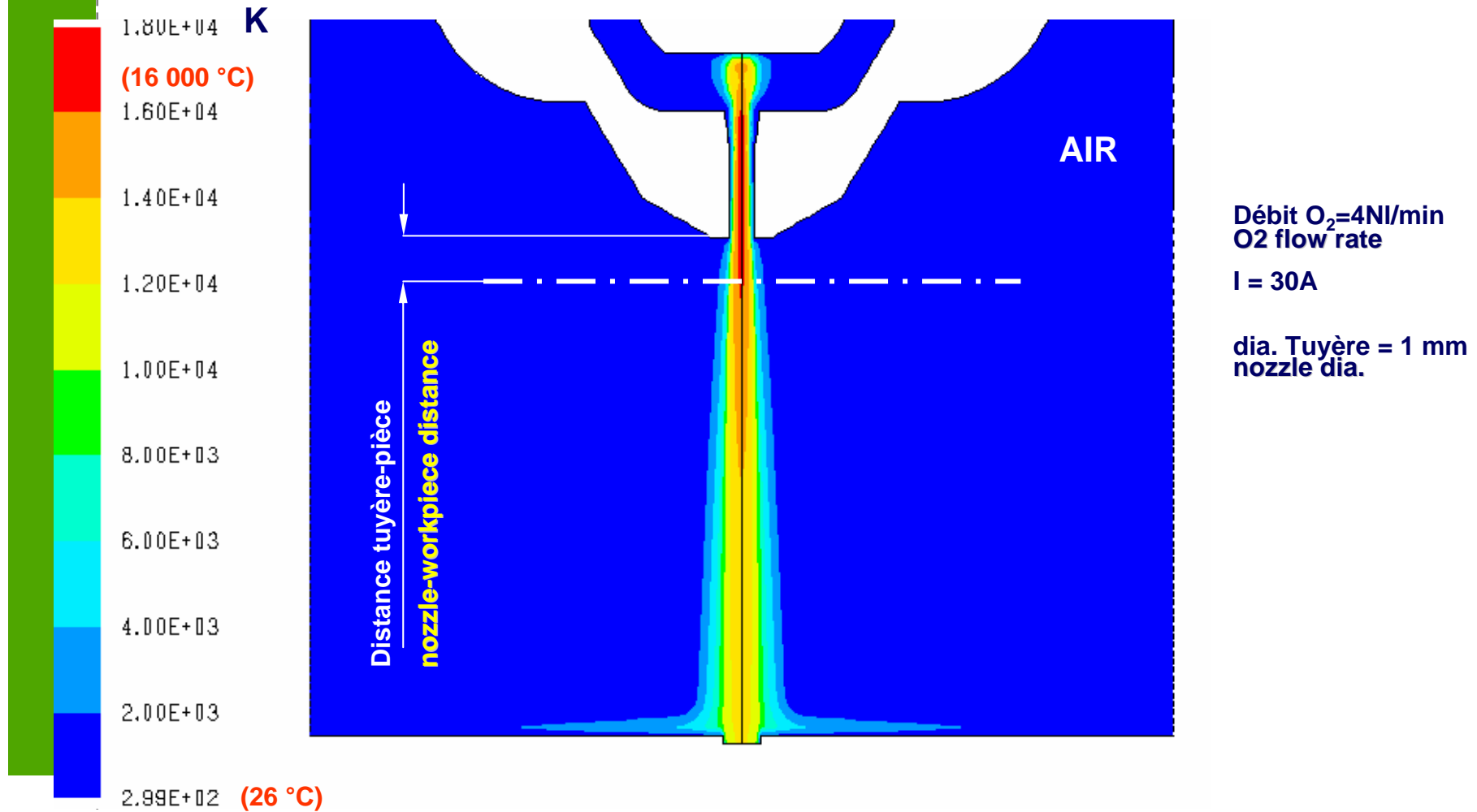
DISTRIBUTION DES TEMPERATURES DANS L'ARC FIELD OF TEMPERATURE IN THE ARC



PRESENTATION DU PROCEDE PLASMA

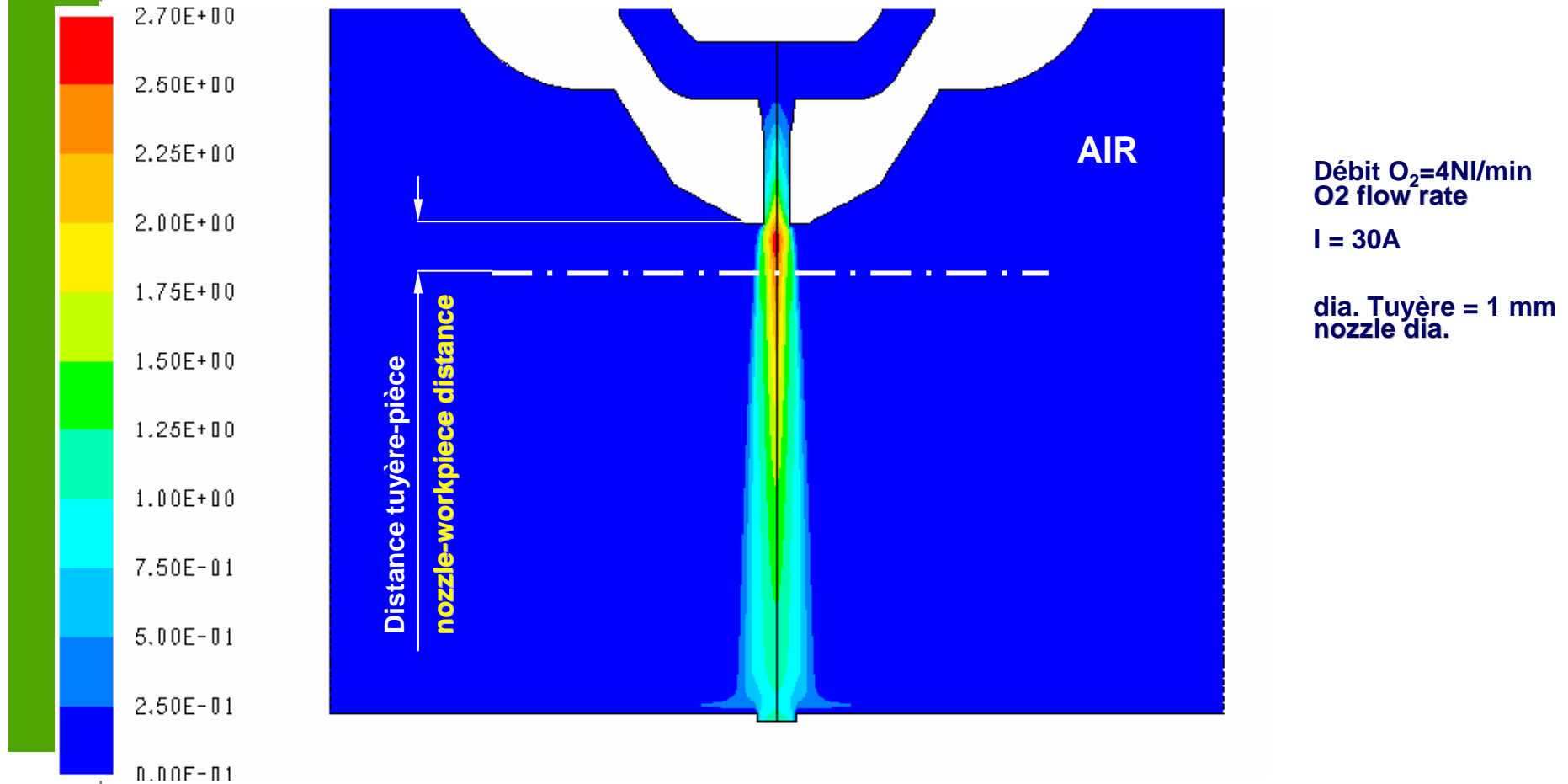
Températures dans le jet plasma

Temperatures in the plasma jet



PRESENTATION DU PROCEDE PLASMA

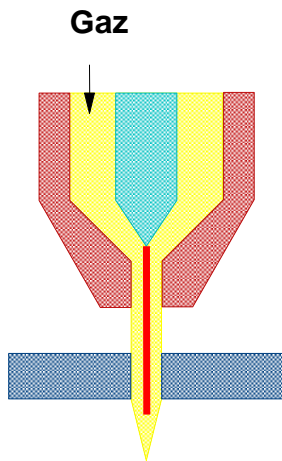
Nombre de Mach dans le jet plasma Mach number in the plasma jet



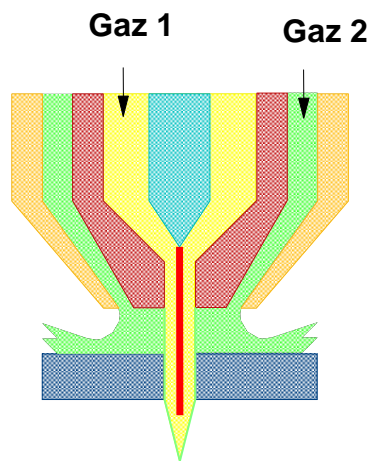
Estimation à partir de la vitesse du son dans l'oxygène pur (Pateyron)

TYPES DE PROCEDES Types of processes

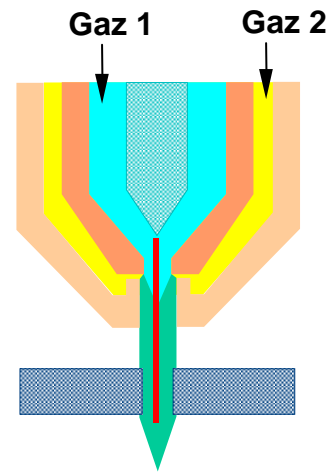
MONO-INJECTION *
SINGLE-INJECTION *



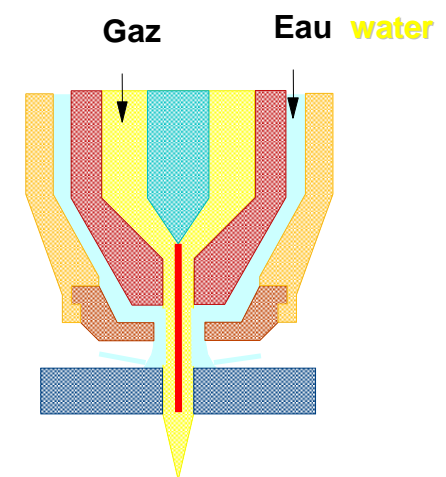
MONO-INJECTION * +
GAZ DE PROTECTION
SINGLE-INJECTION *
+ SHIELDING GAS



DOUBLE-INJECTION *
DUAL-INJECTION *



MONO-INJECTION * +
VORTEX D'EAU
DOUBLE-INJECTION *
+ WATER VORTEX



** injection de gaz plasmagène*
** plasma gas injection*

Plasma double flux DUALGAZ

NERTAJET HP
High Plasma

Constitution de l'installation

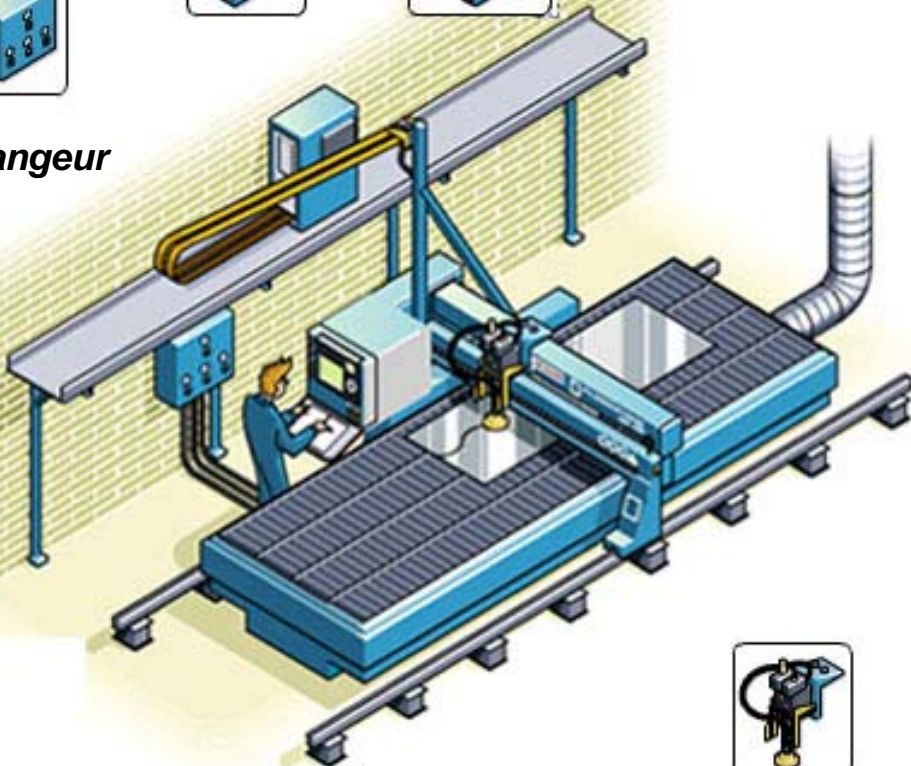
Générateur



Commande numérique

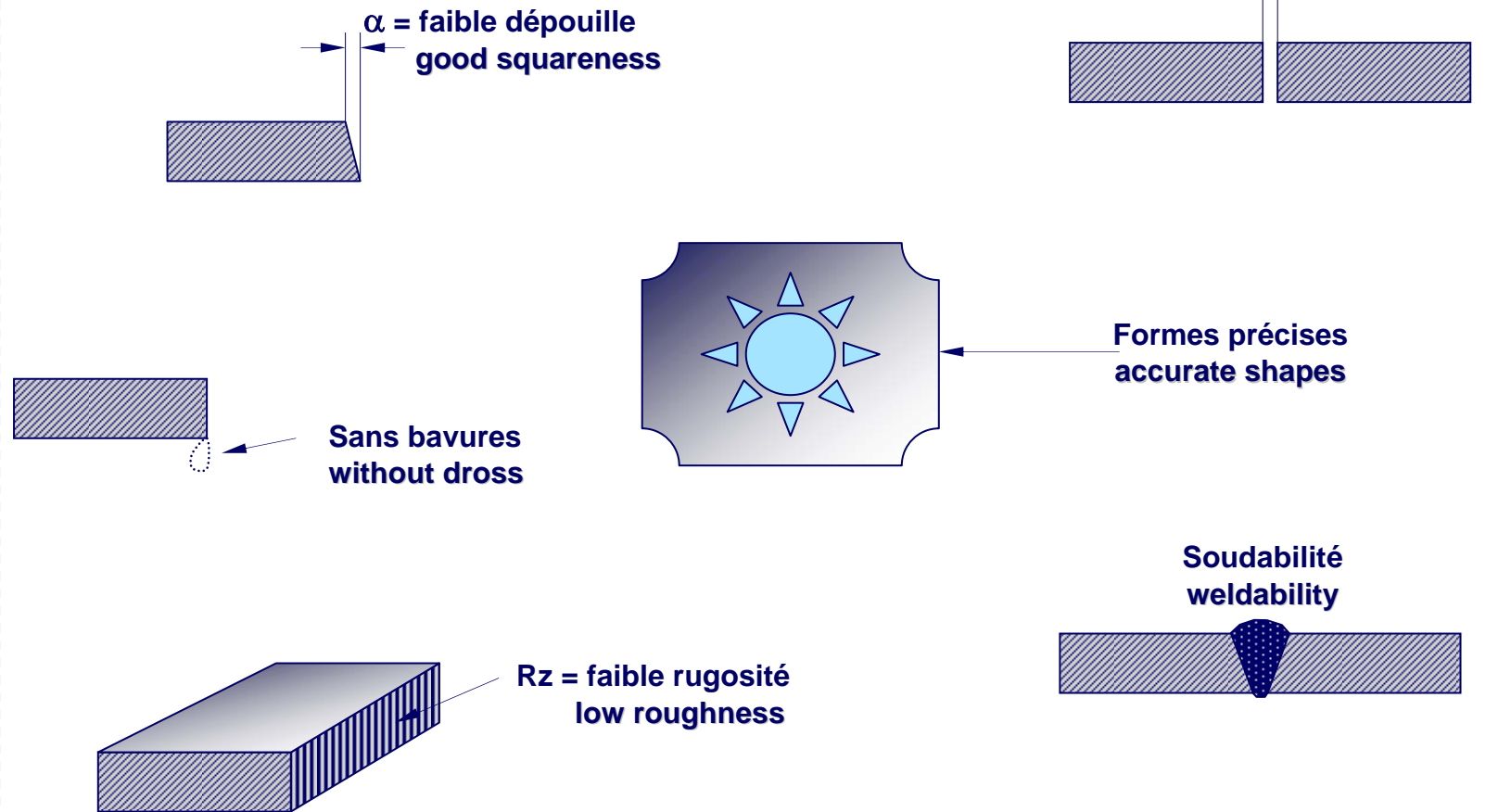


Mélangeur

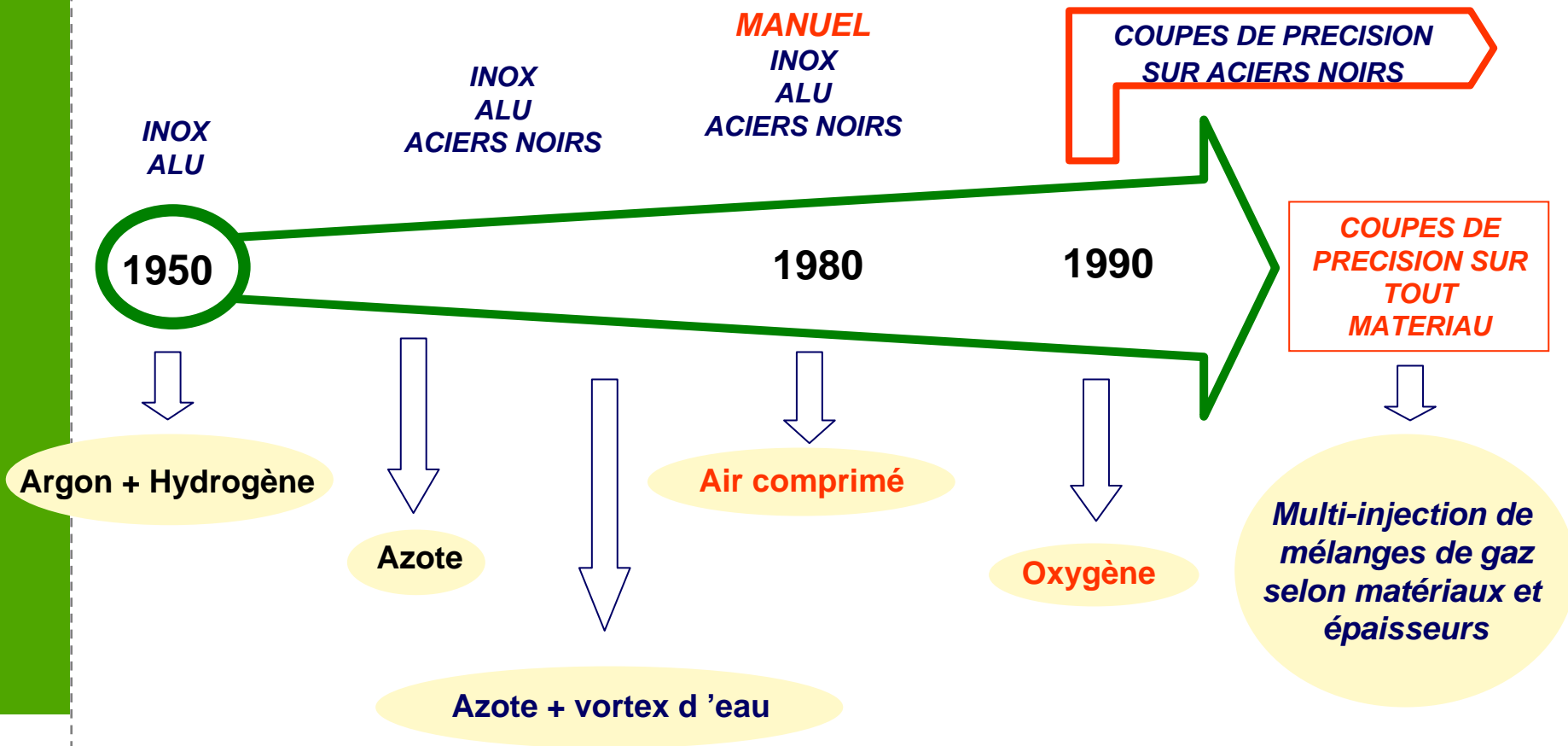


Torche et porte-outil

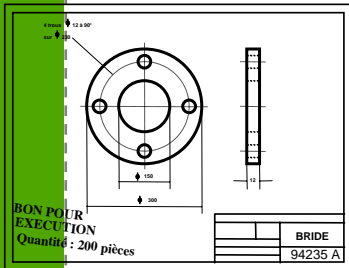
CRITERES DE QUALITE DE COUPE CUT QUALITY CRITERIA



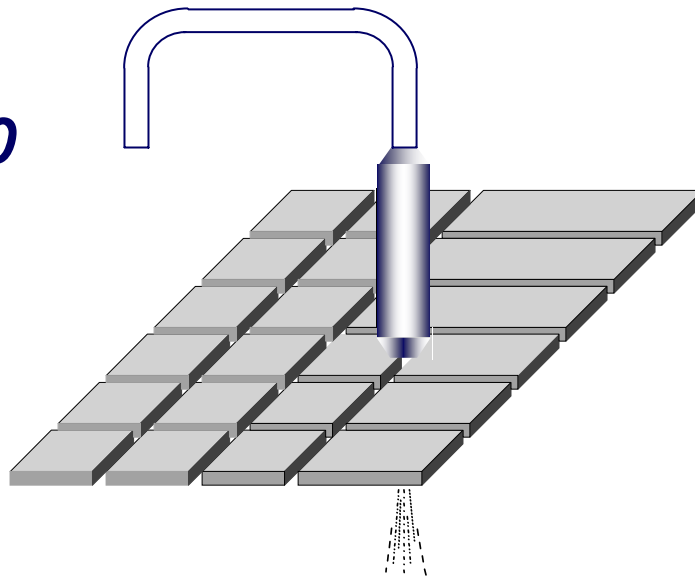
APPLICATIONS INDUSTRIELLES DES GAZ PLASMAGENES INDUSTRIAL APPLICATIONS OF PLASMA GASES



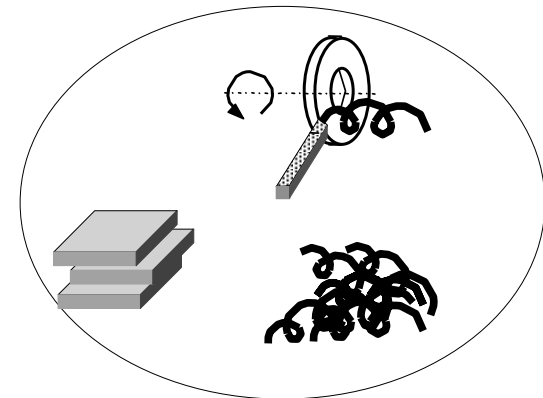
PROCEDE + MACHINES + PILOTAGE DES AXES X ou Y =
process + machines + X or Y driving =



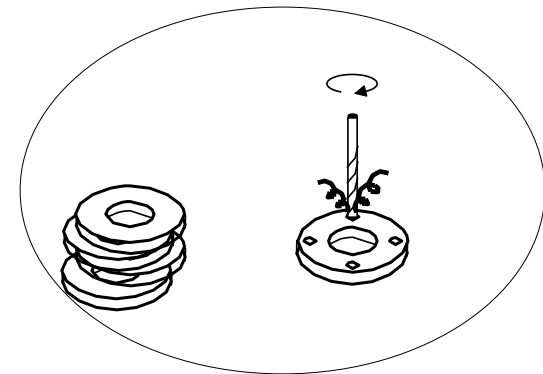
DEBITAGE
straight line cutting



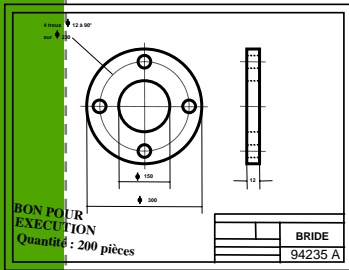
.....1970



Façonnage mécanique
mechanical shaping

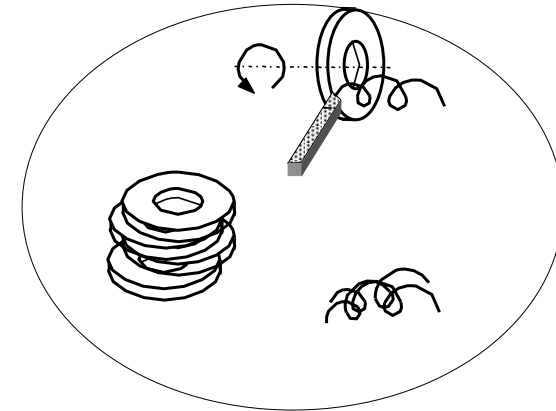
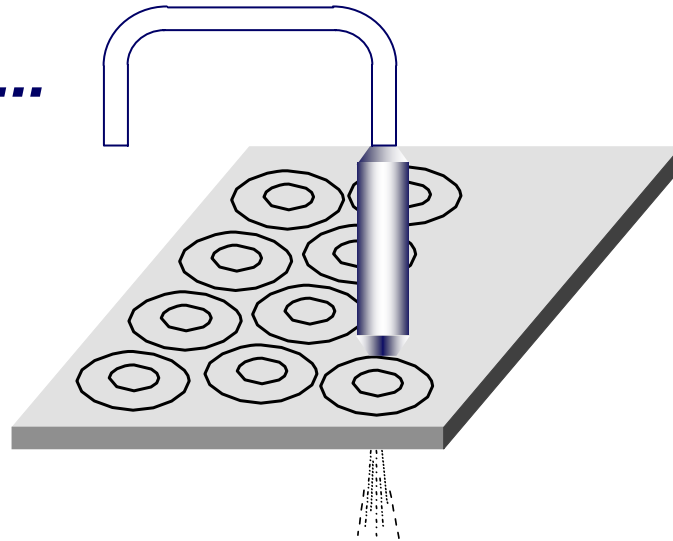


PROCEDES + MACHINES + LECTEURS OPTIQUE...1ères CN =
process + machines + tracing heads...early NC =

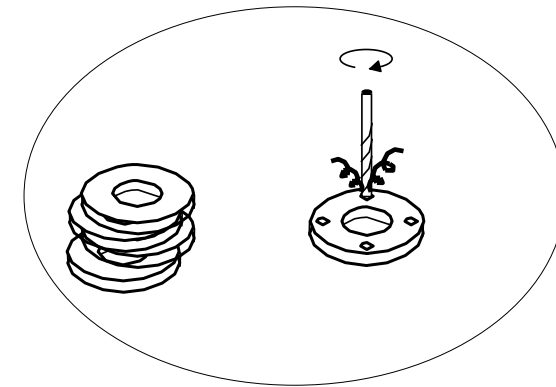


EBAUCHES
rough shape

....1980.....

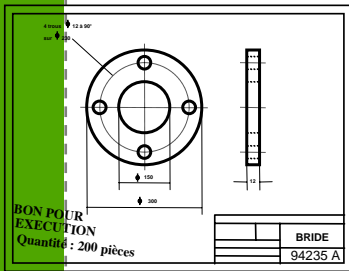


finition mécanique
 mechanical finishing



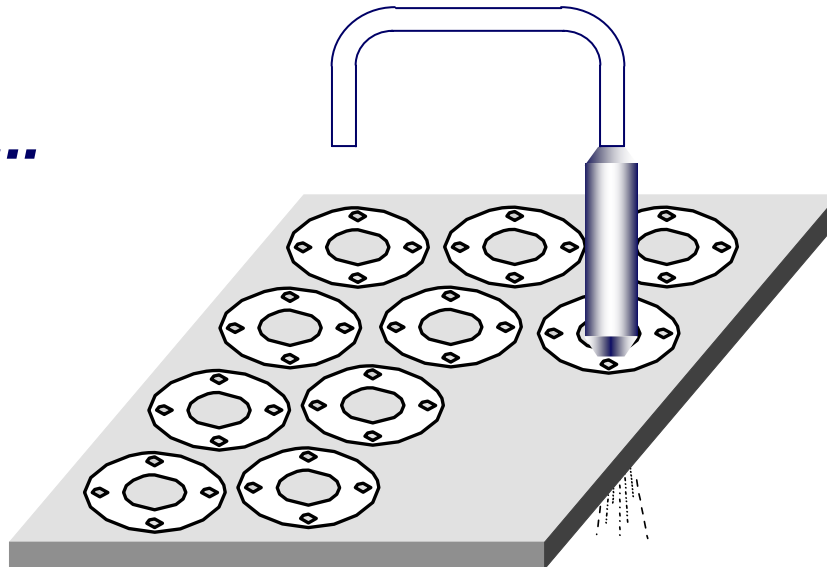
HISTORIQUE DU COUPAGE PLASMA

PROCEDES + MACHINES + CN...directeur de commande =
process + machines + NC...Control Command System =

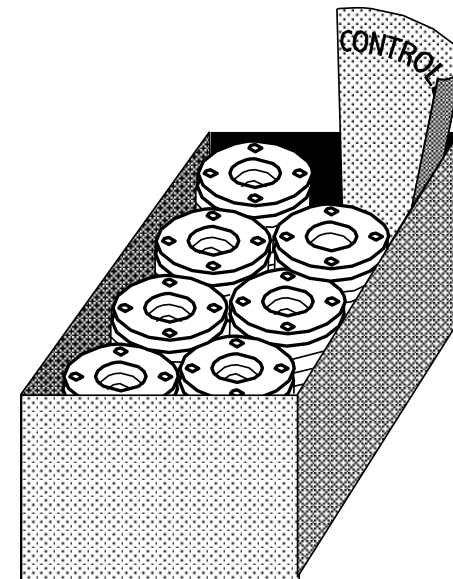


1995.....

USINAGE
tooling



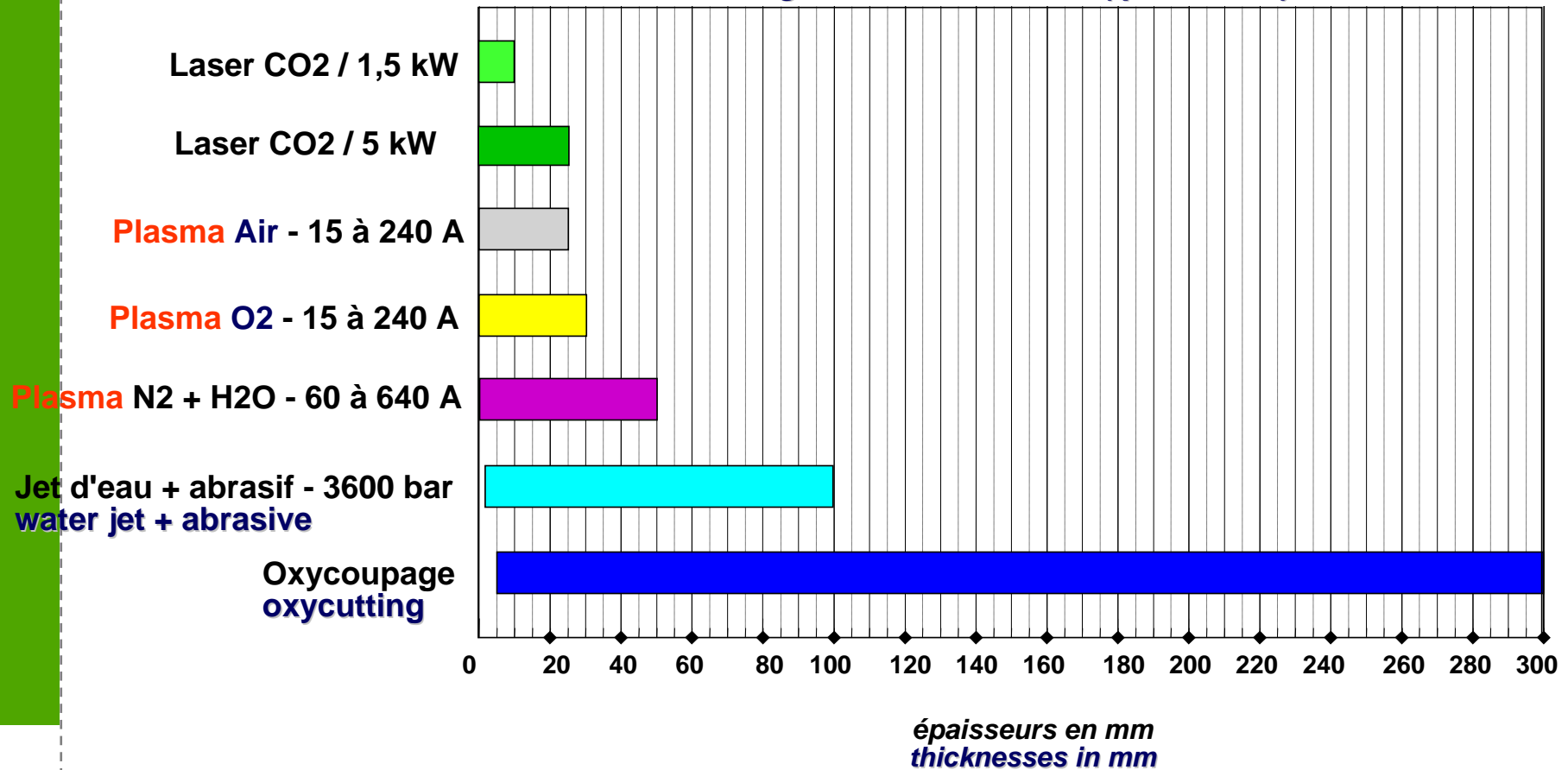
PIECES FINIES
finished pieces



ACIERS DE CONSTRUCTION

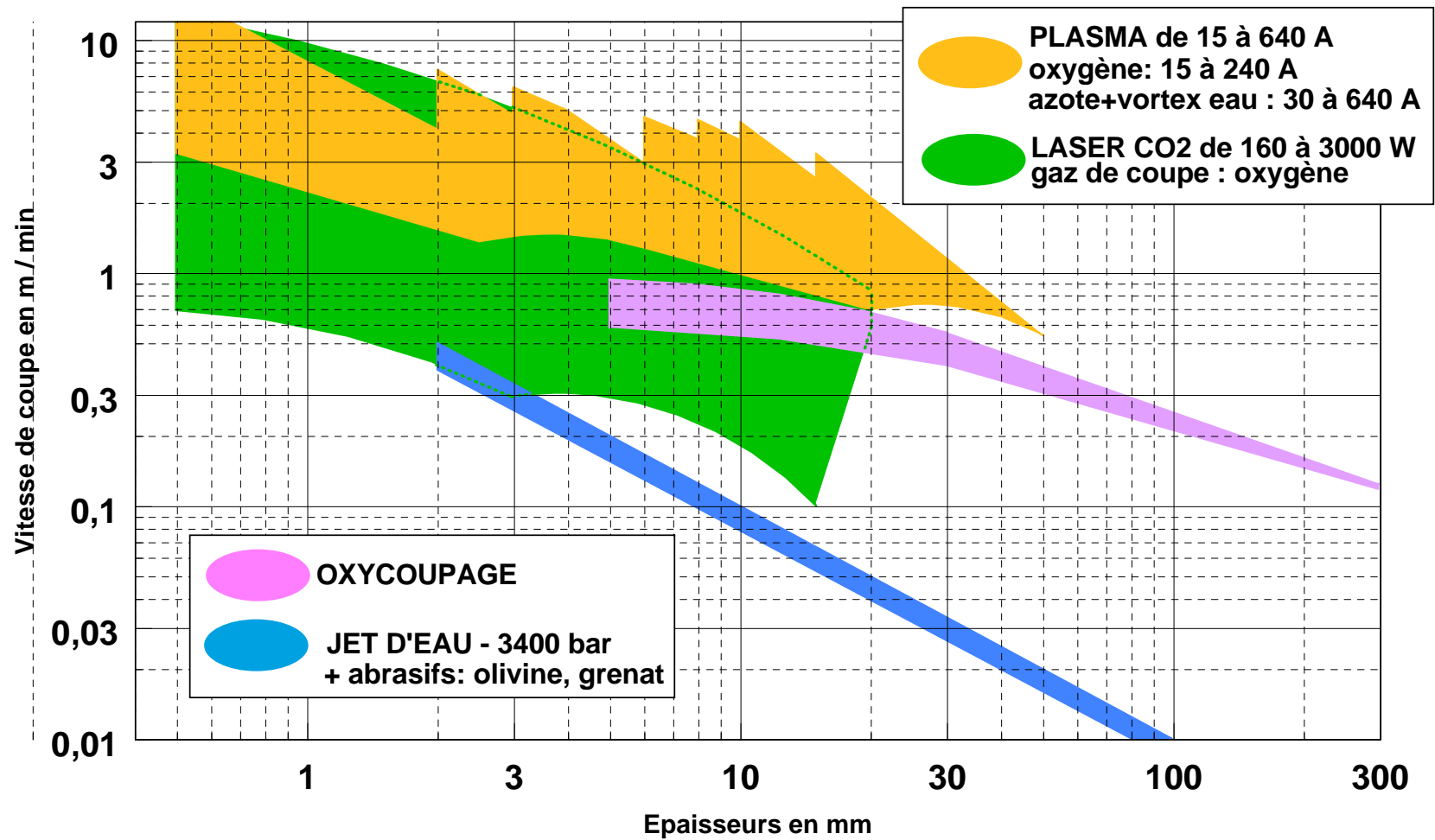
MILD STEELS

GAMME D'ÉPAISSEURS = f (PROCÉDES)
range of thicknesses = f (processes)



ACIERS DE CONSTRUCTION

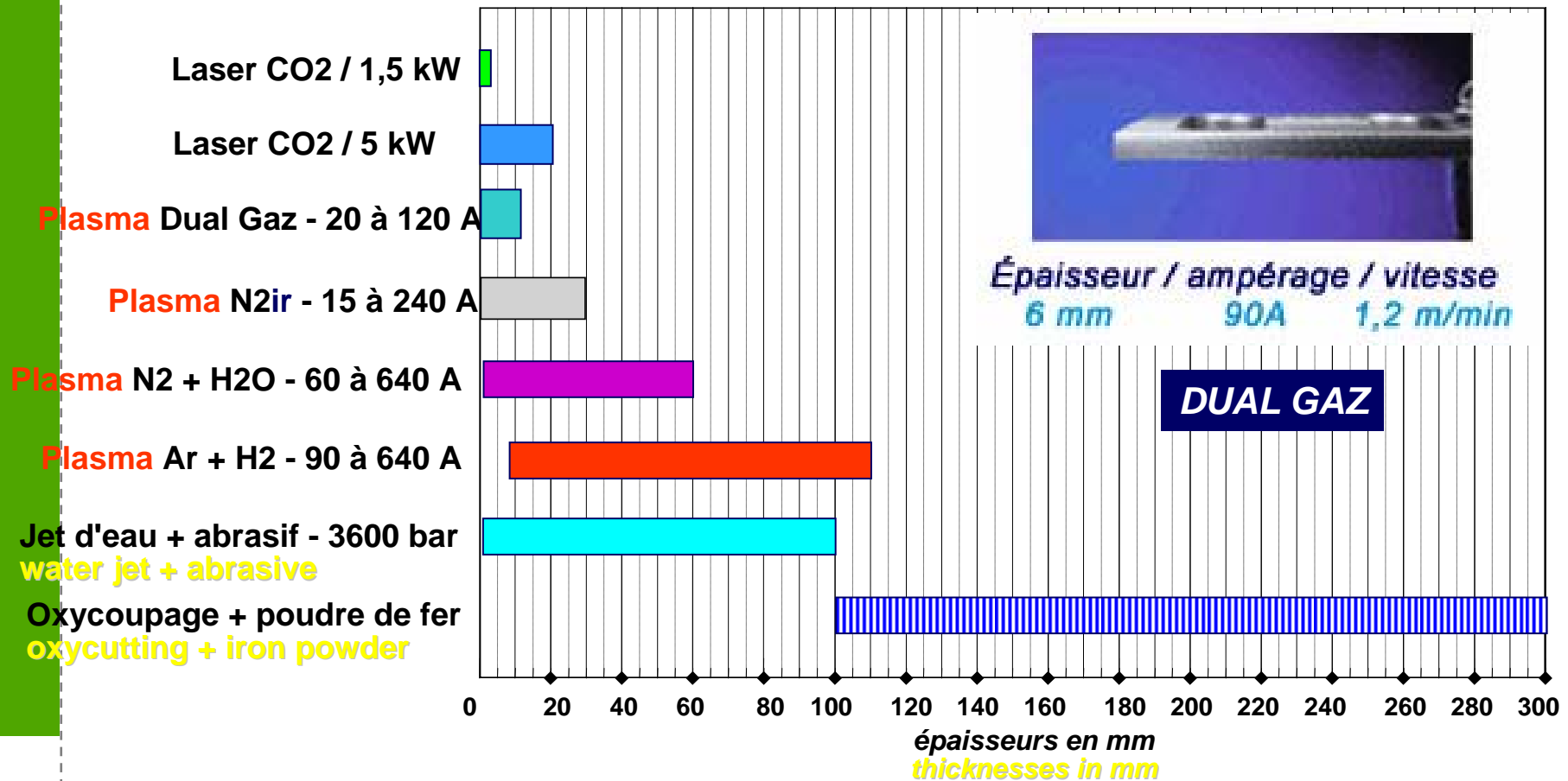
MILD STEELS



ACIERS INOXYDABLES

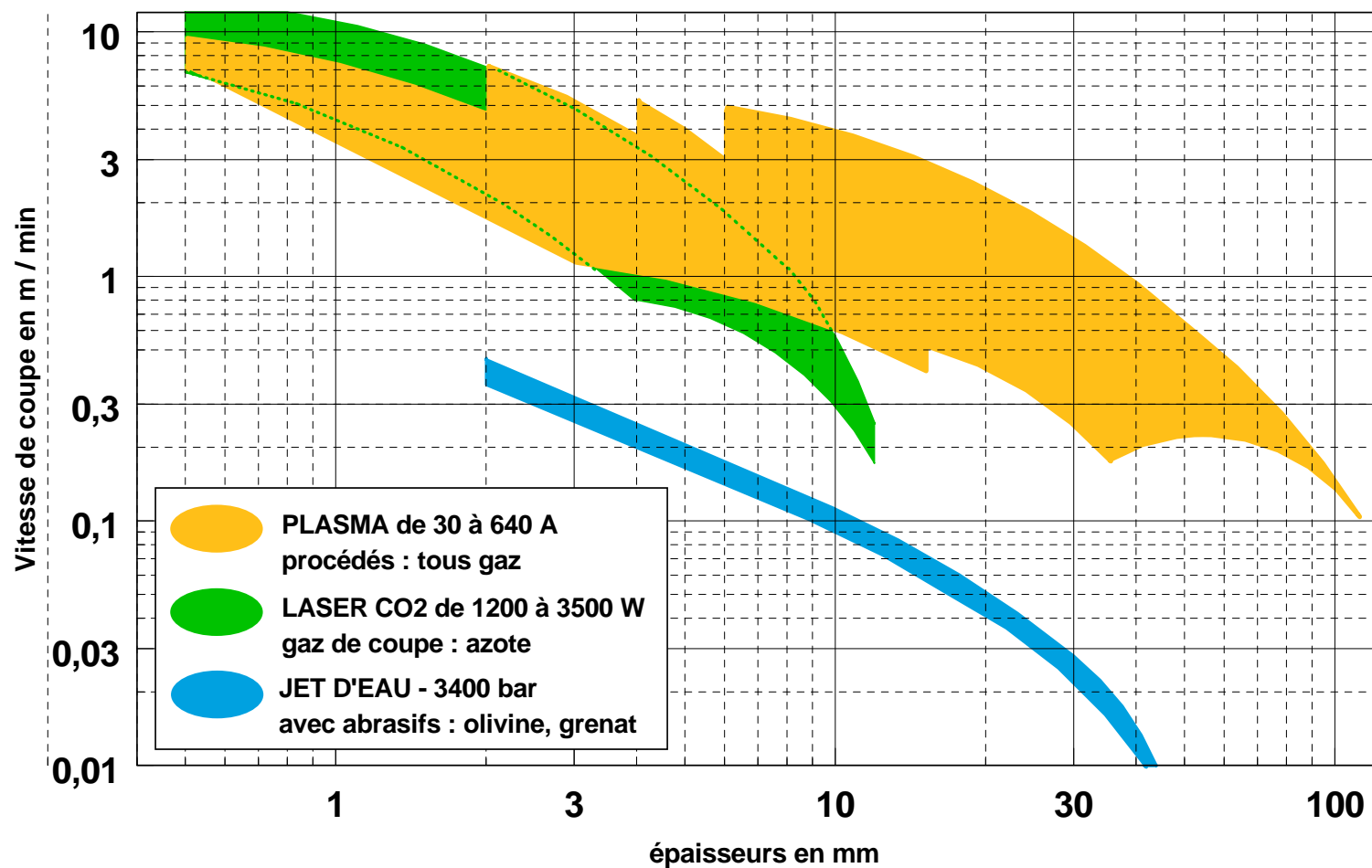
STAINLESS STEELS

GAMME D'ÉPAISSEURS = f (PROCÉDES)
range of thicknesses vs processes



ACIERS INOXYDABLES

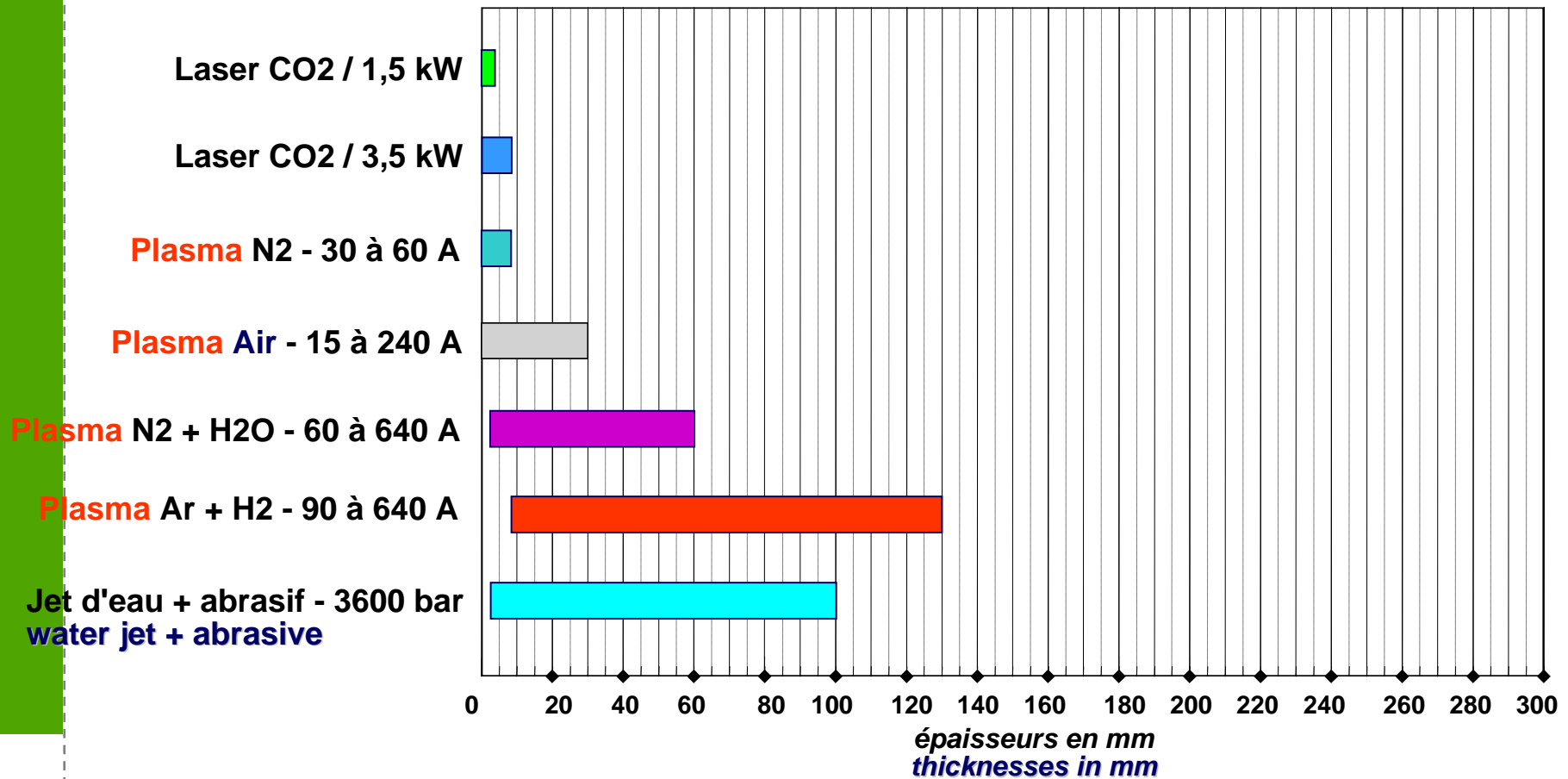
STAINLESS STEELS



ALLIAGES D'ALUMINIUM

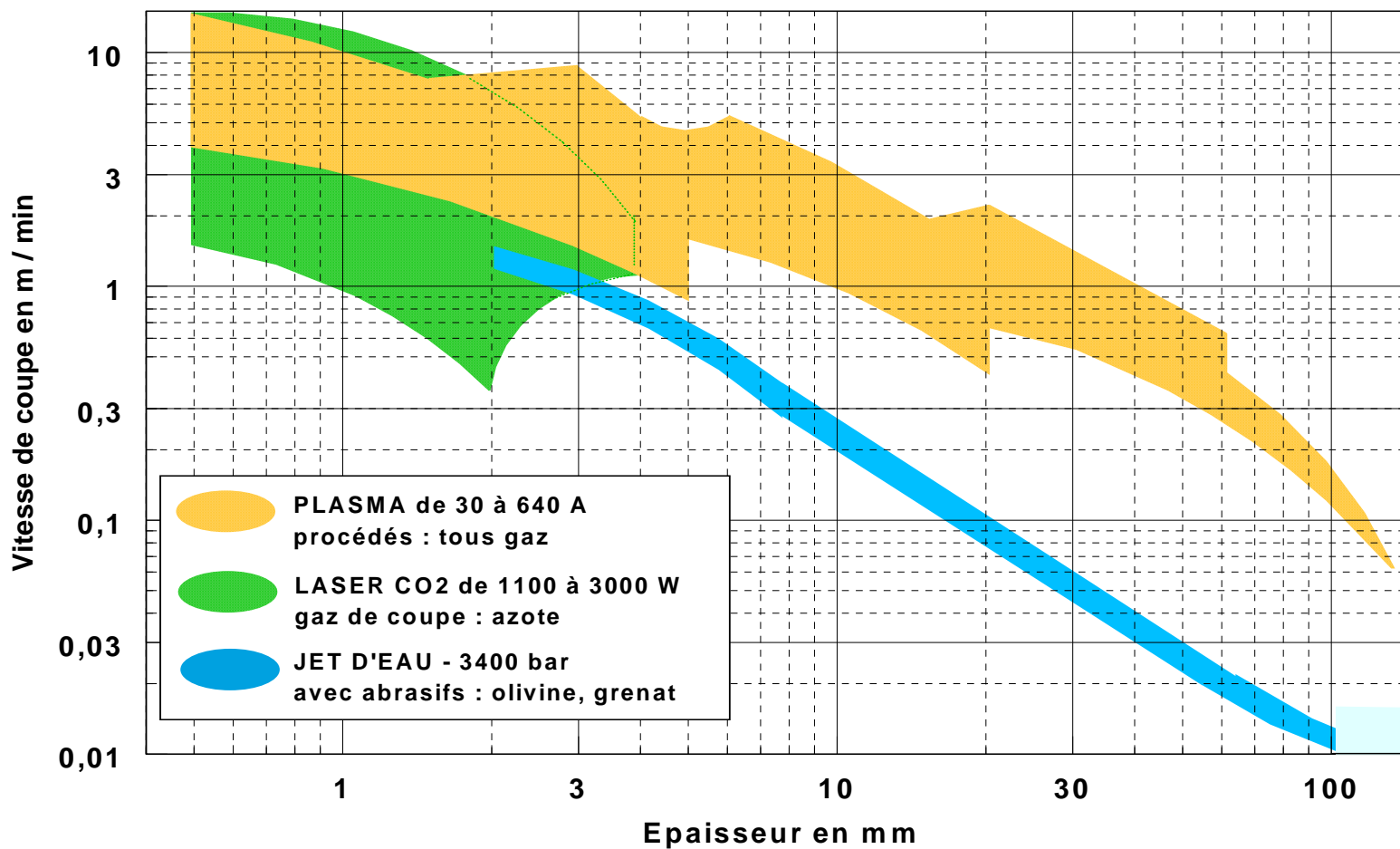
ALUMINIUM ALLOYS

GAMME D'ÉPAISSEURS = f (PROCÉDES)
range of thicknesses = f (processes)



ALLIAGES D'ALUMINIUM

ALUMINIUM ALLOYS



MACHINES CANTILEVER

NOVITOME C
MULTITOME C
OXYTOME 5 C



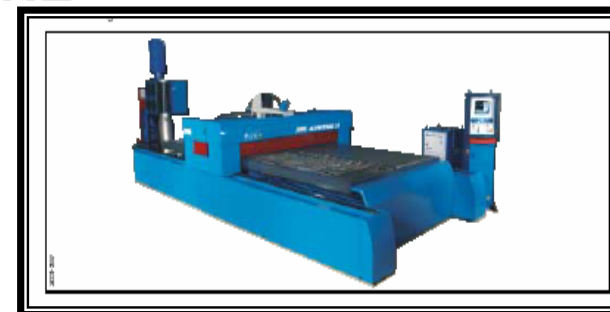
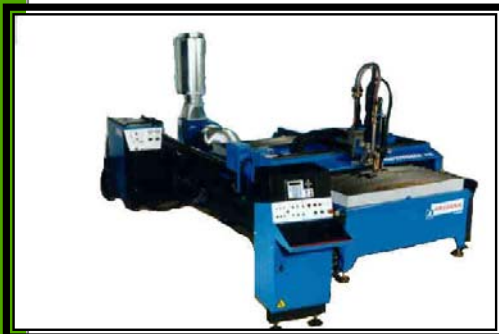
MACHINES PORTIQUES GANTRY MACHINES

OXYTOME
OXYTOME E



MACHINES PORTIQUES PLASMA PLASMA GANTRY MACHINE

OPTITOME
PLASMATOME
ALPHATOME



Commande numérique et HPC digitalprocess



Digisaf 2.5



Digisaf 610



Digisaf 510



HPC Digital Process



Installation de coupage automatique SAF



L'installation est composée :

- un generateur de 15 à 720 A
- Un porte outil motorisé pour contrôle de la hauteur de la torche par tension d'arc
- Un boitier de gestion gaz
- Un boitier de gestion cycle
- Une unité de refroidissement
- Une torche

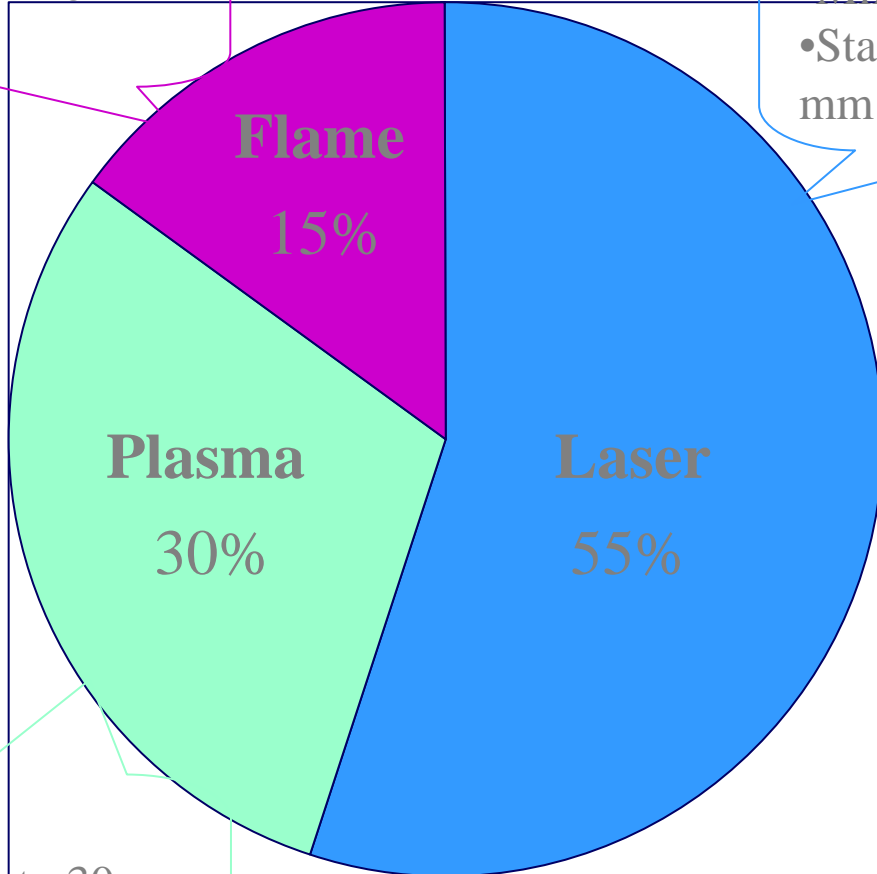


Marché du coupage automatique /Automatic cutting application

European market 490M€

Thickness :
•Mild steel from 10 mm to 300 mm

Thickness :
•Mild steel up to 20mm
•Stainless steel up to 10 mm



Thickness :
•Mild steel 0.5mm to 30mm
•Stainless steel 1 to 150mm

Segmentation client / Automatic cutting Segmentation



Steel cutting companies



Boiler maker



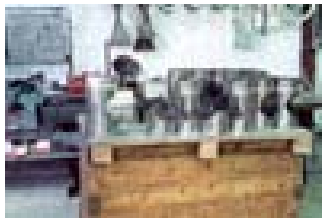
Steel construction builder



Craftwork – Small Business



Tool machine manufacturer



Sheetmetal – Duct cutting-HVAC



Shipbuilding



Power Generation



Transportation & trailer manufacturer



Agriculture equipment manufacturer

***L'usinage plasma des matériaux métallique
à portée de main***

MERCI POUR VOTRE ECOUTE

