

PERFORM HIGH CLASS WELDING WITH HIGH TECH PLASMA WELDING SYSTEMS

Arcraft brings you
PW 200 and PW 400, professional
plasma welding machines



3 PROCESSES IN ONE MACHINE

PLASMA WELDING
Weld Unalloyed, Low Alloy
and High Alloy Steels, Nickel,
Copper, Titanium, Zircon and
Their Alloys and Special Materials

TIG DC WELDING
Weld Unalloyed, Low Alloy
and High Alloy Steels, Nickel,
Copper, Titanium, Zircon and
Their Alloys and Special Materials

**MMAW (STICK)
DC WELDING**
Coated Electrodes, Rutile and Basic,
Non Alloy and high Alloy Steels,
Nickel Based and Copper Alloys

ARCRAFT PLASMA
EQUIPMENTS (INDIA) PVT. LTD.

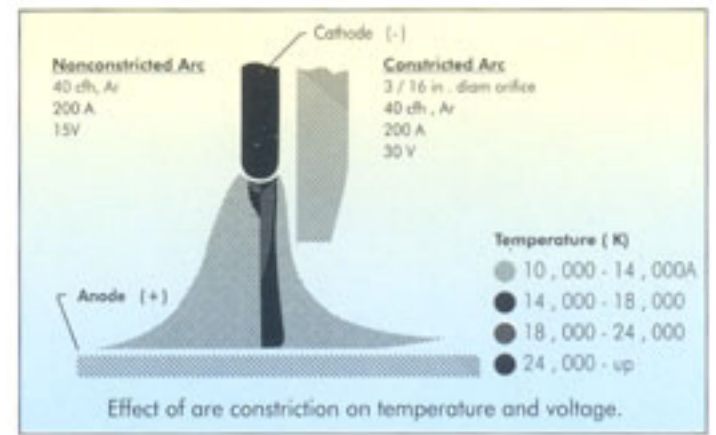
INCREASE - QUALITY • PRODUCTIVITY • SPEED

What is Plasma Welding ?

Plasma arc welding (PAW) is an advanced version of the tungsten inert gas (TIG) welding process. TIG welding has a free-burning arc, which is unstable and tends to wander in the low current range. With increase in current, the arc power increases and the arc diameter also increases.

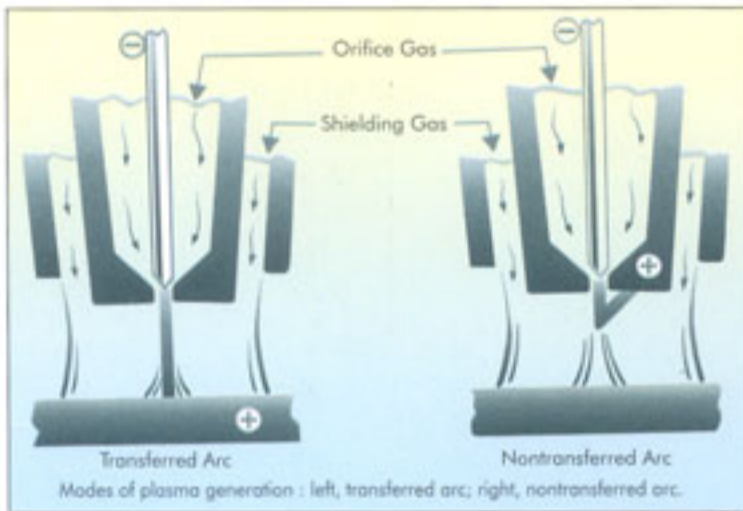
This leads to a lack of concentrated power in the work-piece, which results in a bigger seam and a larger heat-affected zone. Unlike TIG-welding torches, PAW uses a constricting nozzle and employs two separate gas flows, which give rise to a concentrated plasma arc having a narrow columnar shape.

The plasma column is now stabilized along the axis of the electrode and is more intense than the TIG-welding arc. The column temperature is 10,000-24,000 K compared to 8,000-18,000 K in case of TIG-welding.



ARCRAFT PW 200 and PW 400 Plasma welding machines operational capabilities:

Arc Modes in Plasma Welding:



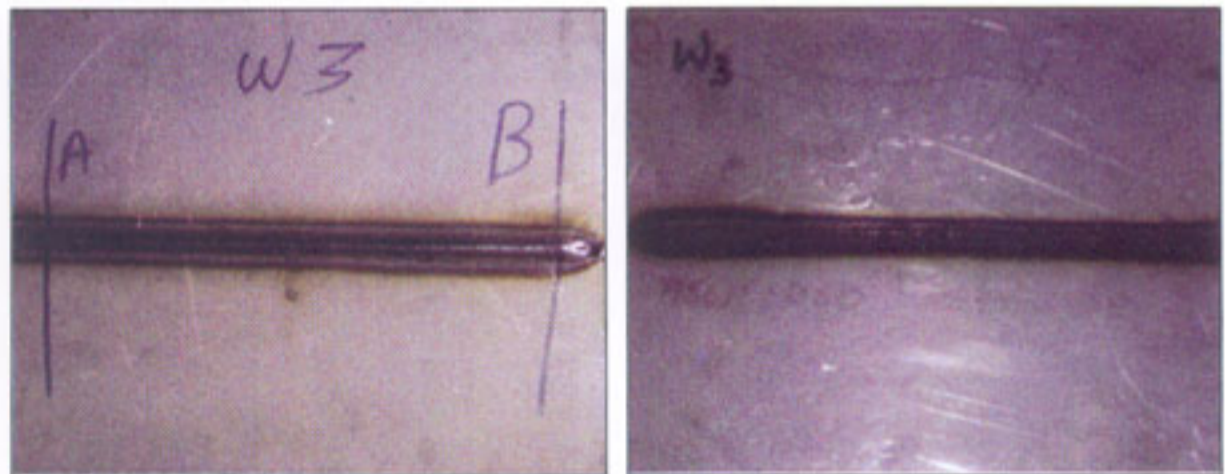
Plasma Welding :

1. Manual plasma-arc welding is usually adapted to non key hole fusion type welding.
2. Mechanized plasma-arc welding is required for high current plasma-arc applications such as making key hole-mode welds or high current filler passed.

Metals welded by these processes: Weld unalloyed, low alloy and high alloy steels, nickel, copper, titanium, zircon and their alloys and special materials.

3. Powder Surfacing (PTA) is used for wear facing and corrosion resistance applications using a wide variety of cobalt, nickel, tungsten carbide, stellite and iron based alloys in powder form.

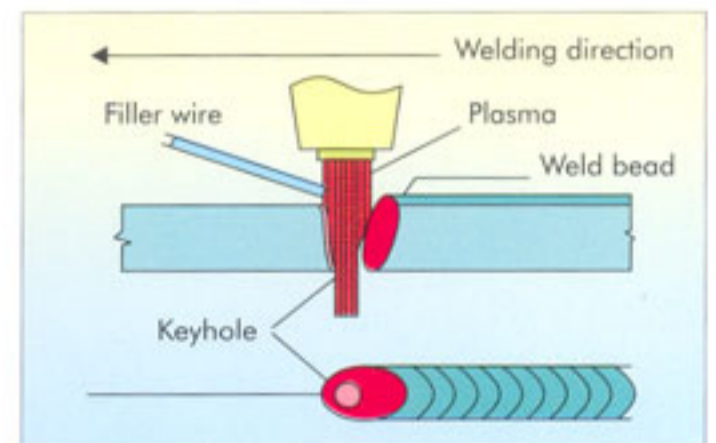
Untouched actual welded sample of 5mm SS Plate completed in one single pass using Key hole Plasma process



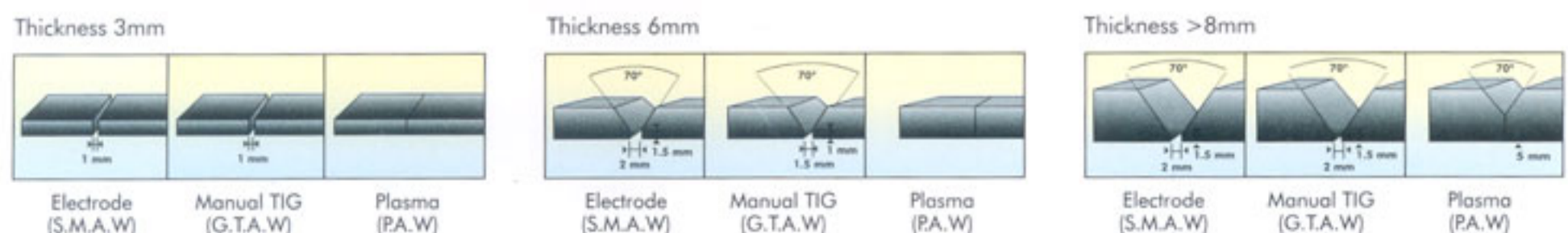
The Plasma-keyhole welding process:

The Plasma-keyhole method is a welding process where the gas flow is restricted through a reduction of the gas orifice. This increases the gas velocity and the arc temperature. The plasma arc blows a hole through the joint or the plate. Behind the hole the molten metal flows together filling the hole, due to the gravity forces, surface tension and the gas pressure from the shielding gas.

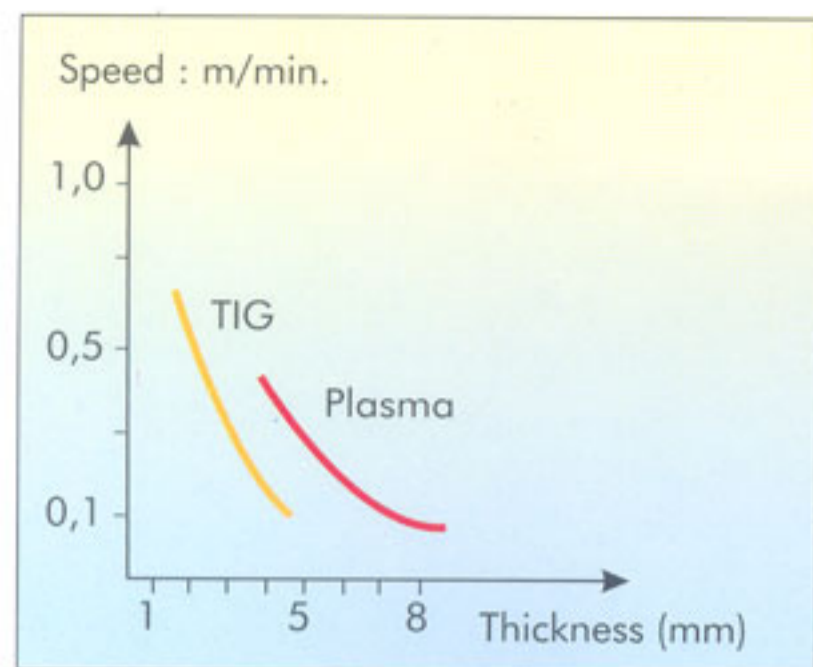
The advantage of the Plasma-keyhole technique is the ability to weld simple I-butt joints in one single run up to a plate thickness of 8 mm. This will greatly improve welding efficiency. An other advantage is the limited distortion obtained with the process due to the even distribution of heat through the plate thickness.



Joint preparation for different welding processes



Welding speed (cm/min.)

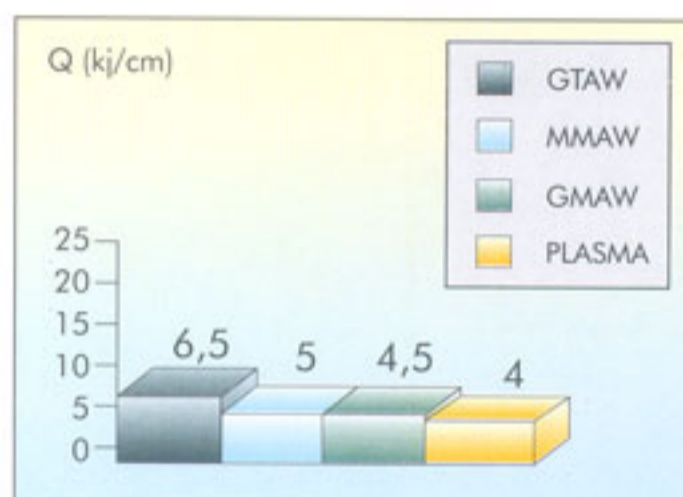


Example of productivity gain with carbon steel (5mm):

- MMAW: preparation + 2 passes at 15 to 20 cm/min + slag removal + grinding.
- Manual TIG: preparation + 2 passes at 10cm/min.
- Key hole plasma: 1 pass at 40 cm/min.

Thickness (mm)	Plasma cm / min
3	50
4	35-40
6	25-30
8	15-20

Approximate heat input for different welding process



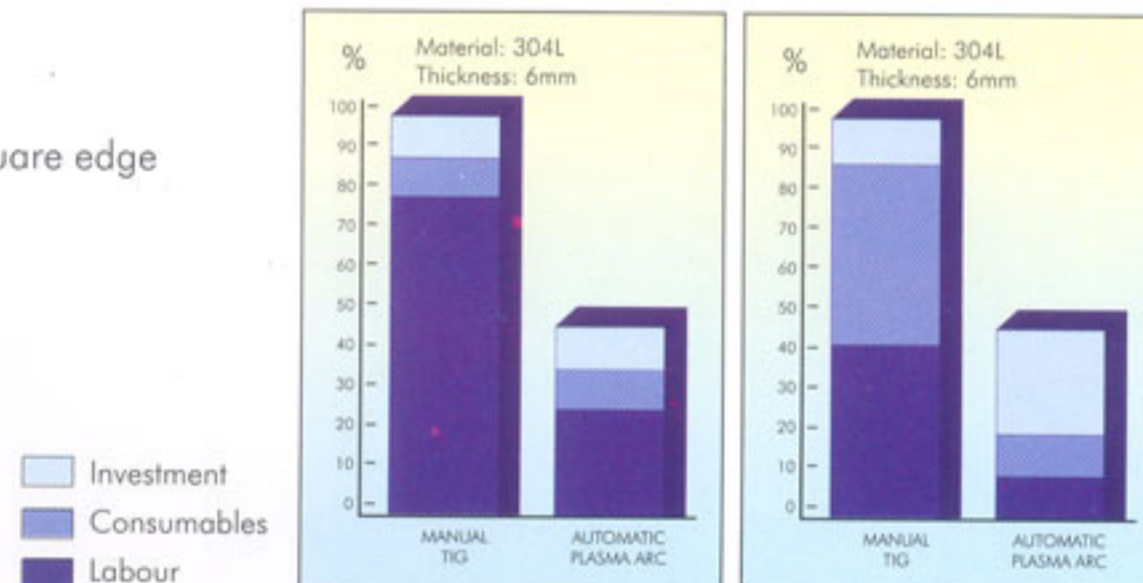
Maximum plate thickness that can be welded in one pass without preparation using plasma process :

Carbon steel and stainless steel, austenitic up to 8 mm, titanium up to 10 mm.

In thicknesses from 2.5 to 10 mm, plasma arc welding (downhand or horizontal - vertical) achieves significant productivity improvements through:

- reduced preparation time (no welding preparations, square edge butt Without gap),
- reduced welding time (single pass),
- reduced finishing and clean-up times,
- elimination of rework due to lack of defects.

Cost of Welding with TIG/Plasma



Unique Features of ARCRAFT Plasma Welding Machine Model PW 200 and PW 400:

1. Designed and manufactured indigenously for the first time in India.
2. Customization of technical features possible.
3. Programmable Current and Gas Down Slope available for automatic closing of key hole during mechanized welding.
4. Indigenously made spares readily available at reasonable price.
5. Service available all over India.
6. Plasma Gun guaranteed for 6 months and power source guaranteed for 1 year against any manufacturing defect.

User Industries:

Aerospace and Space Industries, Cryogenics, Foodstuff and Chemical Industries, Machine and Plant Construction, Automobile Railway, Ship Construction, Tank, Equipment and Pipeline Construction etc.

ADVANTAGES OF PLASMA WELDING:

1. Less sensitivity to changes in Arc length.
2. Recessed electrode reduces the possibility of tungsten inclusions in the weld and can substantially increase the period between electrode dressings resulting in increased life.
3. Weld in a single pass up to 6 mm plates in square butt position and 10 mm plates in only two passes.
4. Keyhole mode of welding gives smaller heat affected zone resulting in reduced strength loss at the joint for heat treated metals, promotes less grain growth which gives better ductility.
5. Reduced weld time results in less embrittlement by carbides and complex intermetallic compounds for stainless steel and super alloys.
6. Equalization of distortion stresses results in less residual stress.
7. Less filler metal required in keyhole mode significantly reduces porosity.

MODEL SPECIFICATIONS	PW 200	PW 400
Input Supply	415V +/-10%	415V +/-10%
Phase/ Freq.	3/50-60Hz	3/50-60Hz
Max Power	8.15KW/11HP	16.3KW/22HP
Input KVA @ 60%	8.9	17.8
Input KVA @100%	6.85	13.7
Current Range (Amp)	5-200	5-400
Current @ 60%	200	400
Current @ 100%	160	308
OCV (Volts)	75-85	75-85
Pre Flow	1-5 Sec	1-5 Sec
Post Flow	1-5 Sec	1-5 Sec
Up Slope	1-5 Sec	1-5 Sec
Down Slope	1-5 Sec	1-5 Sec
Plasma Gas Down Slope	1-5 Sec	1-5 Sec
Pulse Frequency (Hz)	1-100	1-100
Pulse Time	10-90%	10-90%
Pre Settable Current	Yes	Yes
Class of Insulation	H	H
Pilot Arc Current (Amp)	5	5
Power Source Cooling	Air cooled	Air cooled
Torch Cooling	Water cooled	Water cooled
Dimensions W x L x H	700 x 685 x 920 (mm)	700 x 685 x 920 (mm)
Weight in Kgs.	125	145

ARCRAFT PLASMA EQUIPMENTS (INDIA) PVT. LTD.

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* Technical Specifications are subject to change for continues improvement

YOUR PARTNER FOR METAL WELDING, CUTTING,
AUTOMATION SOLUTIONS AND WELDER TRAINING