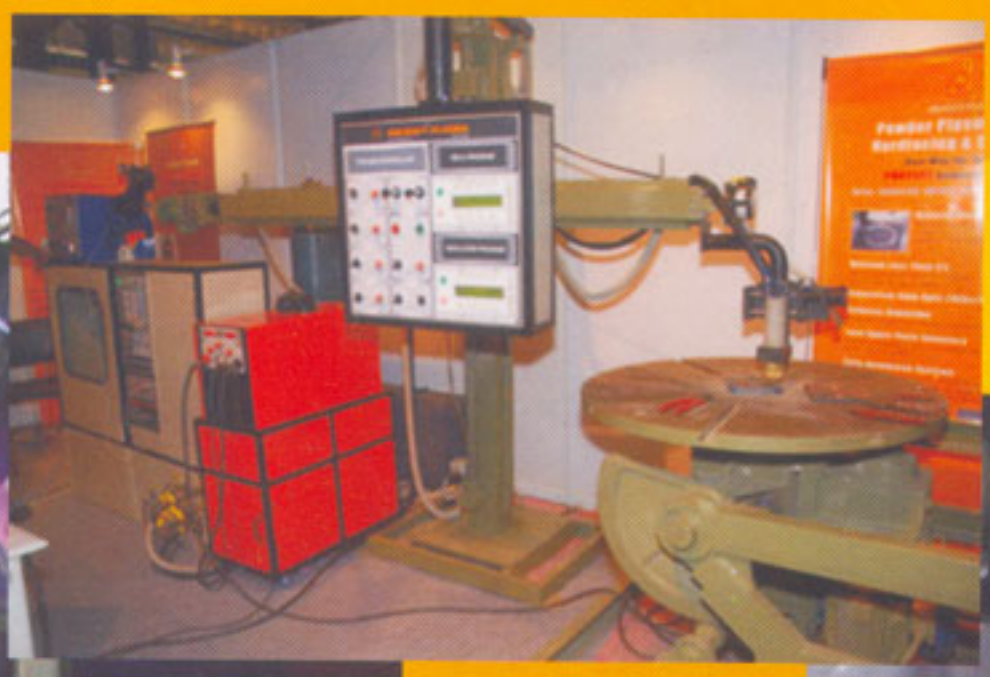
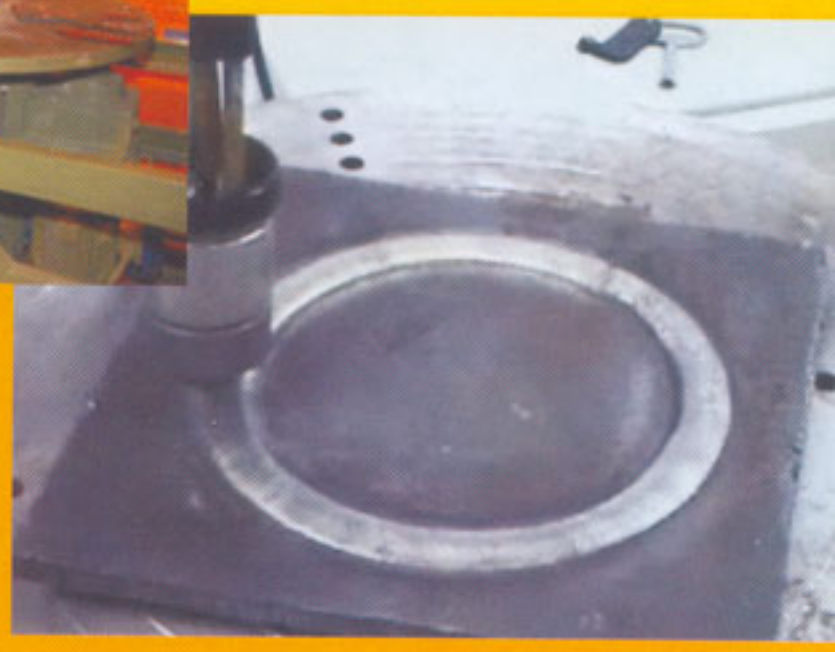
PTA

HARDFACING & CLADDING





Protect Mechanical Parts
Subjected to Intense Wear,
Corrosion, Abrasion,
Thermal Shock, Impact etc.
With our PTA System

ARCRAFT PLASMA
EQUIPMENTS (INDIA) PVT. LTD.

PTA (Plasma Transferred Arc)

Plasma Transferred Arc System (PTA) is a high energy, inertgas welding process. Ar is basically used for arc plasma supply, powder transport and molten material shielding. It produces a very high quality deposit offering optimal protection with minimal dilution or deformation of the base material. It is a process that deposits very precise coatings of perfectly controlled alloys on mechanical parts that are subject to intense wear, significantly extending their service life. PTA technology is particularly effective in a protection against corrosion, thermal shock and abrasion. A wide range of overlay alloys is available for practically any part. Some alloys are very hard, others are softer with hard abrasion - resistant particles dispersed in a matrix. Certain alloys are made to rebuild a part to a required dimension while others are designed to be a final overlay that protects the work surface.

BENEFITS OF HARDFACING

Reduces Cost : Restoring a worn part to "as new" condition generally costs between 20-70% of a brand new replacement part.
Prolongs equipment Life : Service life increase of 3 to 10 times are common with properly overlaid parts.
Reduces Downtime : Parts last longer and fewer shutdowns are required.
Less Spare Parts Inventory : There is no need to keep numerous spare parts when worn parts can be rebuilt.

PTA HARDFACING PROCESS

The PTA welding systems can deposit metal alloys on metal surfaces at rates of up to 20 lb/h. The system can be fitted with automated manipulators to handle different parts, even those with complex shapes and narrow tolerances.

The PTA system works with different metal powders as filler material, such as chrome carbide, tungsten carbide, and nickel and cobalt powders. Future development could also see the use of ceramic based powders. These hard wearing materials can improve the durability of the weld.

When used to deposit powder metal alloys on a substrate, the PTA system has a dilution level of 3 to 7% Compare this to submerged arc system, which can dilute the base metal by as much as 40%. Combined with a narrow heat affected zone, the PTA system's low dilution rate prevents undersired substrate changes and can enhance the alloy's wear performance in applications for manufacturing wear components. It also results in a smooth surface finish for easier and quicker finishing and machining.

APPLICATIONS

In a competition with laser surfacing the PTA technology offers much more high productivity, comparable high quality of deposits and significantly lower costs.

Typical application areas of the PTA technology are extruding machine screws, valves, valve seats of internal combustion engines (motorcar, marine, locomotive etc.), accessories for ships, petroleum industry and power generation, cutting tools (milling cutters, broaches, knifes), Equipments for mining, crushing, rolling, road building and tunneling, Process equipment, Agricultural equipment, parts for nuclear plants, parts for chemical plants.

SUMMARY

P.T.A. DEPOSITS SHOW THE FOLLOWING CHARACTERISTICS :

An attractive bead with no signs of oxidation, and with little or no ripple.
Very low dilution.
High, density, no porosity & no inclusions.
Microphotos or x-rays show the deposits to be of high density & metallurgically bonded to the Substrate.

SPECIFICATIONS

Purpose

This PTA is offered for welding overlay using Powder metals and alloys such as Stellite, SS, Nickel based, Tungsten carbides etc for the purpose of hardfacing, cladding on components.

LIST OF SUB MODULES

1. Powder Feeder.
2. Plasma welding power source.
3. Tilting type Head stock & tail Stock type job rotating unit.
4. PTA Torch
5. Control panel & Pendant Unit.
6. Column & Boom Type Torch manipulator
7. Oscillator for torch weaving.
8. Water Chilling Unit

Technical Details

CONTROL CONSOLE

This module consist of the following parts.

1. Plasma gas flow meter : 0 - 5 LPM
2. Shield gas flow meter : 0 - 15 LPM
3. Cooling water pressure switch
4. Water and gas terminations
5. Torch connection unit
6. Solenoids for the gas paths
7. Electrical switchgear for above
8. Arc starter unit
9. Gas purge switch
10. Gas inlet pressure switch

System Specifications

Power Source Specifications	POWER200	POWER400
INPUT		
Input Supply	3P, 415V±15% 50Hz/60Hz	3P, 415V±15% 50Hz/60Hz
Max Installed power	11 Hp	24 Hp
Input kVA @ 60% duty cycle	8.6	19.4
Input kVA @ 100% duty cycle	6.6	14.9
OUTPUT		
Open circuit voltage	75-85 V DC	75-85 V DC
Current range	4-200A	5-400
Current @ 60% duty cycle	200A	400A
Current @ 100% duty cycle	154A	308A
Pilot Arc Current	5 - 40A	5-40A
Plasma Gas Flow Meter	0 - 5LPM	0 - 5LPM
Shielding Gas Flow Meter	0 - 10LPM	0 - 10 LPM
MMAW/TIG Facility selection	Provided	Provided
Current Pre-Setting Facility	Provided	Provided
High Frequency Test	Provided	Provided
Water Failure Trip	Provided	Provided
Gas Failure Trip	Provided	Provided
Digital Ammeter & Digital Voltmeter	Provided	Provided
Open circuit voltage ON / OFF	Provided	Provided
Base current	4 to 200 A	5 to 400 A
Up slope	0 to 10 sec	0 to 10 sec
Down slope	0 to 10 sec	0 to 10 sec
Dimensions WxHxL mm	680x900x700	680x900x700
Weight in Kg	105	125

Arcraft Plasma offers you a positive displacement feeder with the benefits already discussed and not a gravity based feeder

DIGITAL OSCILLATOR

Electronic programmable type linear ball screw mechanism with digital display, displays parameters like speed, Stroke, Dwell time.

Technical specification of Digital Oscillator

Stroke	:	(0 - 50mm)
Speed	:	(0-60) per min. strokes @ 25mm stroke width.
Motor	:	(2-Ph / 6V / Stepper)
Regulator	:	Micro controller drive / PLC
Right dwell	:	0.1 to 9.9 sec.
Left dwell	:	0.1 to 9.9 sec.

POWDER FEEDER POSITIVE DISPLACEMENT

Technical Specification

Weight Capacity	:	5 kg.
Delivery	:	0.3 kg - 5 kg. per hour
Motor	:	Ac geared
Speed control	:	Variable frequency drive
Power	:	220 Vac / 1-p / 70 watts.
Rota meter	:	Carrier gas 0-15 LPM
Digital Display	:	Disc RPM indicator

PLASMA TORCH

PTA torch capable of depositing Nickel, cobalt, Tungsten carbide, SS and all other PTA grade powders
Plasma torch is metal clad (No Moulding) and fully dismantable for easy cleaning.
Plasma torch is straight type for automated welding
Plasma torch has metallic shielding cup for protecting the nozzle.
400 AMPS capacity, PTA torch with 8 meter cable, nozzle with 2 powder ports, water cooled nozzle holder with powder ports and aligning facility for nozzle, provision for shielding gas, 4 mm tungsten rod with collet.

COLUMN & BOOM TORCH MANIPULATOR UNIT

1. Column Travel	:	1500mm
2. Boom Travel	:	1000mm
3. Boom Unit	:	This Boom is having 1000mm stroke with oscillator mounted for weaving. Auto shifting
	:	function synchronization provided with turntable for continuous welding. All parameters
	:	presettable.
	:	100mm stroke cross slide assy unit with Torch
4. Cross Slide assy	:	Swivel assy unit

TILTING TYPE HEAD & TAIL STOCK MANIPULATOR / POSITIONER

Speed	:	0.2 to 2.0 RPM as standard.
Load Capacity	:	500 kgs. Non-Eccentric loads (Extendable as required)
Speed control	:	Digital variable frequency drive, stepless
Tilting	:	Motorized fixed speed from 0 to 90 Deg. Auto / manual selector, CW / CCW selector,
Constrols	:	Rapid / normal speed selector, digital rpm meter
Table Height	:	1000 from the ground level. (Extendable as required)
Fixture	:	Manual Chuck will be provided for holding the job

Technical specification of Water Chiller

Flow rate	:	5 lpm
Outlet temperature	:	10-25 C adjustable
Input	:	415 VAC / 3-phase / 0,5 HP
Tank	:	25 ltrs.

Refrigerated heat transfer type of efficient cooling of the PTA torch.

HOSE & CABLES KIT

Contains all interconnecting cables, gas hoses, water hoses & welding leads.

CONTROLLER FOR HARDFACING SYSTEM

Digital microprocessor based or

Programmable Logic Control (PLC) with 4 Input and 8 Output to Control Power Source, Positioner, Oscillator & Powder Feeder, Water Re-circulator Cum Chiller. Housed in a separate Control Panel.

Full function with digital timers for auto sequence or manual operation.

It Controls

1. PTA on / off
2. Powder feed speed.
3. Positioner on/off
4. Positioner speed / forward-reverse direction.
5. Oscillator on/off
6. Oscillator functions.
7. Column & Boom: Up, Down, Left, Right inching.

Controller is capable of operating the system to various deposition modes

1. Straight deposit
2. Circular deposit
3. Screw / Spiral type deposit
4. Multiband deposit
5. Partial deposit
6. Partial multiband deposit

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