EXPRESSION OF INTEREST

Mechanized programmable oscillating GMAW system synchronized with Turn Table for Narrow Groove Stelliting Process(with local preheating system)

QUALIFYING CONDITIONS

i. Only OEM (Original Equipment Manufacturer) vendors, who have supplied and commissioned at least one similar Groove Welding system of the nearly same or higher sizes (Weld boom & column with travel length X-5000 mm, Length max. including sliding GMAW welding head -7750, Y-5000 mm, Turn Table diameter 2500 mm, Load carrying capacity-20 MT and provision of manipulator / positioned for rotation of Casing) in the past five years and such welding system presently working satisfactorily for more than one year after commissioning, should respond. Integrated system where all above parameter are programmable.

ii. The following information should be submitted by the vendor about the companies where similar Mechanized programmable oscillating GMAW system synchronized with Turn Table system have been supplied.

a) Name of the customer / company where similar GMAW systems is installed.

b) Complete postal address of the customer.

c) Month & Year of commissioning.

d) Broad specification of GMAW systems with local Preheating system mentioning Job size & its weight.

e) Name and designation of the contact person of the customer.

f) Phone, FAX no. and e-mail address of the contact person of the customer.

g) Important:-performance certificate from the customers regarding satisfactory performance of the GMAW system supplied to them (Original Certificate or Through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required.

iii. Offer of only those vendors will be considered who will qualify above qualifying conditions of Expression of interest. Other offers shall not be considered.

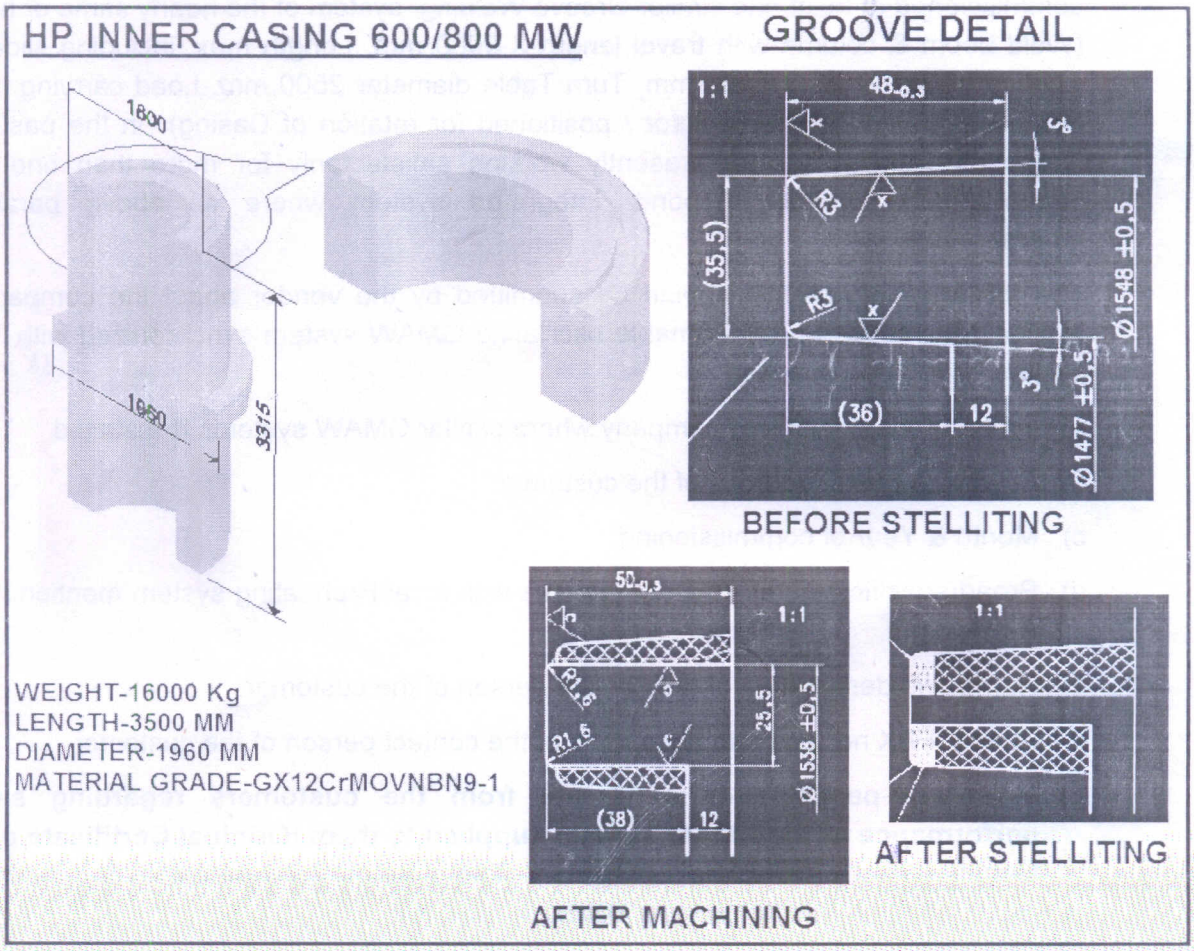
iv. Vendor must reply point wise to Technical Feature (A to J) of Expression of Interest.

DETAILS OF COMPONENTS

A. HP Inn er Casing

- Weight of R/M HP Inner Casing (half):- 16000 kg
- Length: - 3500 mm
- Diameter: -1960 mm (max.)
- Material grade: - HW19683 **(GX12 CrMoVNb9-1)**

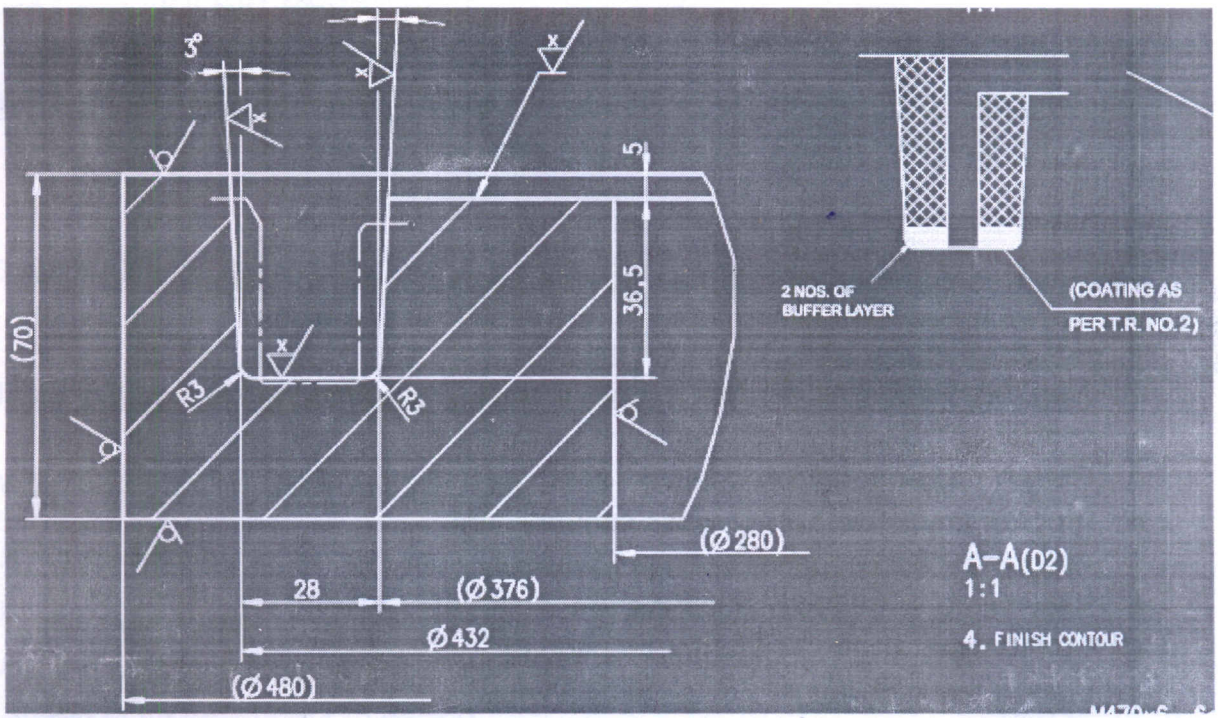
Groove Details-



B. Thre aded Ring

- Weight of R/M Threaded Ring-40 kg
- Diameter-480 mm
- Height- 70 mm
- Material grade- HW18802 **(X10 CrMoVNb9-1)**

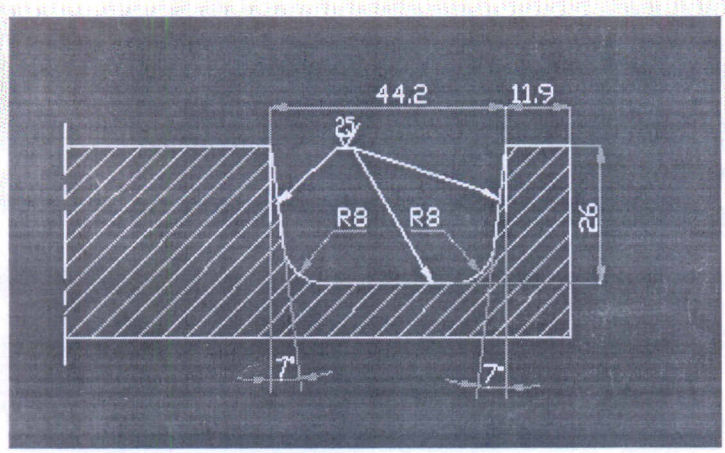
Groove details-



C. Conical Half Ring

- Weight of two conical half ring after joining back to back- 1025 kg
- Outer diameter-4782 mm
- Material grade- AA 10119(IS 2062 grade)

Groove details-



TECHNICAL FEATURES OF

Mechanized programmable oscillating GMAW system synchronized with Turn Table for Narrow Groove Stelliting Process

Narrow Groove GMAW Stelliting System consists the following

1. Column & boom type GMAW machine.
2. Turn table for rotating the grooved casing in both directions with variable speed control.
3. GMAW power source & welding heads.
4. Programmable welding process control panel.
5. Associated accessories- Voltage Stabilizer
6. Resistance local pre heating system
7. CCTV camera with monitor for monitoring
8. Standalone mobile fume extraction system

MIG WELDING MACHINE

A. Inverter based Constant Voltage Synergic MIG Power source:-

- Input Supply: - 415 V±10 % variation, 3 phase, 50 HZ ± 3% variation.
- Amp. Range: 500 A @ 60% duty cycle and 400 A @ 100% duty cycle.
- Power source cooling: - Forced Air cooling.
- Code of construction: IP 23.
- Modes: Continuous current & Pulsed mode.

B. WIRE FEEDER UNIT-

- Light weight, compact and rigid wire feeder with powered and grooved 4 roller drive and wire straightener.
- Suitable for wire size diameter (Stelliting wire): - 0.8, 1.0, 1.2. 1.6 mm.
- Wire feed speed continuous controllable: - 1 to 20 m/min.
- Drive with servomotor with integrated feedback system.
- Forward / Reverse feeding.
- Gas inching / wire inching
- Dynamics control to minimize spatter level.

C. GMAW WELDING TORCH-

- Water cooled GMAW welding torch suitable for stellite cladding of narrow groove on horizontal and vertical face of HP Inner Casing.
- Should be suitable for stelliting wire size of diameter 0.8,1.0, 1.2 & 1.6 mm.
- Provision of free adjustable positioning of the torch in different angle positions.
- Provision of hand indexing unit of torch.

- Torch rating should be 450 A @ 100% duty cycle.
- Torch length should be sufficient to cover all ranges of the component.
- Remote ON / OFF switch.

D. WATER COOLING UNIT-

- Input Voltage: To be specified by vendor
- Capacity of water tank: Min. 5 litres
- Flow rate: 2 to 3 Lit / min
- Hydrostatic head: 10 m

E. G AS MANIFOLD UNIT-

- Adequate gas manifold unit for GMAW process to be provided including gas valves, pipe connections & support unit. Flow meter should be provided on the gas path at appropriate location for gas flow measurement.

F. MOTORIZED COLUMN AND BOOM

X Axis- Boom-

- Boom movement horizontal - 5.0 mtr
- Length Max. including sliding GMAW welding head-7.750 mtr
- Speed of travel- vendor to decide
- Control cabinet with central and sub distribution for X and Y movement for welding manipulator, the welding system and all other equipment. The control cabinet should moveable.
- All control cabinet to be fixed on stand at bed plate.
- The vertical and horizontal boom should be designed in such a manner that it is able to take the load of wire feeder unit and its accessories.
- Maintenance free boom drive unit with hardened guidance.
- Manipulation of vertical motion should be with joystick.

Following modes of carriage motions (X-axis) required-

Mode 1- Slow movement for high precision torch positioning.

Mode 2- Rapid movement with high speed 1m / min.

Mode 3- Adjustable feed ranging from 1mm / min to 2000 mm / min.

There should be provision of stoppers for carriage at both ends of rails.

- Flexible angle for GMAW torch.

Y Axis – stroke-

- Vertical column height to suit job of 5.0 mtr
- Vertical movement speed range:- continuously adjustable – 10 – 10,000 mm/min.
- Vertical column with 360 degree rotational movement.
- Manipulation of vertical motion should be with joystick.

- Base of column should have provision for clamping on bed plate.

G. TURN TABLE

- Load carrying capacity- 20 T
- Table face plate diameter with provision of extension – 2.5 mtr
- Provision for clamping with Jaw and clamping with bed plate having alignment guide.
- Speed (continuously adjustable)
- Speed range – 0.01 – 5.0 rpm
- Centralized control programed unit mounted at appropriate height.
- Welding current transmission- 1000 A
- Remote control with digital display indicator.
- There should be provision of rotation of turn table clockwise / anticlockwise separately in programme & manual mode both.
- The rotation movement should be controlled by main control panel through operator panel.

H. SPLIT TYPE OPERATING PLATFORM

- 2 nos. operating platform are manually movable / adjustable height each platform covers one side of job for better accessibility Approx. size 4500 mm x 2500 mm.

I. LOCAL HEAT TREATMENT SYSTEM

- Resistance heating system is required at groove area of HP Inner Casing for preheating at 220 – 300 deg. C during welding of buffer layers and stellite 21 at the groove walls.
- The local preheating shall consist of temperature controller with built in paperless temperature recorder.
- Purpose- During welding pre heating will be continued till completed the stellite welding in groove.
  - i. Local pre heating system should be inclusive of-
    - a. Power rating at 100% duty cycle – 300KVA min.
    - b. Suitable programmable temperature controller.
    - c. 24 channel paperless recorder.

- Associated Accessories-
  - i. Connection cable from transformer to control station with plug & socket.
  - ii. Connection cable from control to heating pads with plug & socket.
  - iii. Jumper cable
  - iv. Compensation cables with plug & socket.
  - v. Compensation jumper leads with plug
  - vi. 6- point thermocouple connector for each half of casing.
  - vii. Thermocouple attachment unit.
  - viii. Calibration unit with 6 point cable.
  - ix. Hand held Thermometer.

J. SERVO VOLTAGE STABILIZER

- Oil / Air cooled suitable servo controlled voltage stabilizer suitable for complete Machine , its drives, controls, PLC etc. if required , for unbalanced load & supply conditions considering specified power supply & ambient condition (0-50 deg. C)
- Rating
- Make & Model.
- Main supply: 415 V AC, 3 phase,3 wire, 50 HZ.

K. CENTRAL CONTROL PANEL SYSTEM

Software module of process control unit should contain following-

a) Provision of selecting welding process.
b) Provision of pre-programming of various parameters, e.g. voltage, wire feed rate, welding speed, dia of stelliting groove location, preheating temperature, gas flow rate, pre purge, post purge etc.
c) Provision for storing 10 sets of parameter in a single setting.
d) Provision of manual adjustment of main welding parameters e.g. voltage, welding speed & wire speed during welding process.
e) Provision of digital display of all parameter, e.g. voltage, current, wire speed, welding speed, pre heating temperature including details of layer number, seam number, height of weld completed / balance weld height.
f) Provision of restart of stellite weld from same location after unexpected stop e.g. power failure.
g) Provision of selecting manual / automatic mode of welding process.
h) Provision of generating programme, saving programme, editing of programme deletion of programme of different components.
i) Provision of joystick to control the movement of the machine manually.
j) Provision of remote diagnostics facility.
k) Provision of password protection for changing critical parameters.
l) Provision of dry run of welding torch before start of actual stellite weld for each layer.

L. OTHER FEATURES-

a) Provision of suitable infrared temperature sensor (digital highly accurate pyrometer) for non contact type temperature measurement during satellite welding.
b) Provision of CCTV Camera system to monitor welding process before and after the welding area.

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2/5/2013
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