

NAME OF THE EQUIPMENT	QUANTITY
NON FERROUS MELTING FURNACE CAPABLE OF MELTING AND MELT STIRRING WITH TILTING ARRANGEMENT	1 SET

Detailed specifications for "Non ferrous melting furnace capable of melting and melt stirring, with tilting arrangement"

1. Furnace temperature range 1000°C and maximum working upto 950°C
2. Furnace power rating 415 Vac, 6.0 Kw. Maximum 01Ph, 3 wires 50 Hz.
3. Silicon Carbide cylindrical Crucible- external Size Volume 10kg, H 300mm x diameter 200mm approx.
4. Electro-pneumatically operated split type furnace door, for metal loading and discharging purpose.
5. Furnace should have impeller / propeller type stirring system for molten Aluminium at various depth & speed. The speed range of the stirring system should be between 100-600 RPM or more. The said stirring system should be operated by a robust motorized threaded rod supported by back structure. Straight type, rod type and fan blade type propeller should be provided for stirring purpose.
6. The furnace should be fitted with controlling unit containing PID controller (make: Eurotherm Honeywell or Similar standard) with digital display. Display should be as below:
 - (a) **No. of pattern:** 1- 4,
 - (b) **Pattern status:** Must have at least 16 segments (Ramp + Soak)
 - (c) **Control Ramp Configuration:** 5°C/ min or lesser .
 - (d) **Control Action:** PID & Fuzzy Control (with auto tuning and auto stop facility)
 - (e) **Accuracy:** +/- 2-3°C between 200-1000°C
 - (f) **Temperature protector:** Solid state relay power control system.
 - (g) **The system should provide:** (a) Ammeter, (b) Volt meter, (c) Pilot LED Lamp Indicator and necessary fuse unit including with emergency stop switch.
7. Communication RS232 or similar, Protocol: MODBUS-RTU, Speed: 9600 bps or greater. Necessary software must be provided for operating the furnace temperature control system. The software must be compatible with Window 10, Scan time/Logging time: temperature programmable facility to view the real time line graph of the process value (12-24hrs duration), Data base must be created in the back ground which can be seen in tabular form with real time and date, the records can be searched by date and time or by the user selectable field. The program of ramp & soak, tuning and start & stop must be done by software through.
8. The pneumatic double cylinder operated front top pivoting tilting arrangement for furnace should be fitted and operated under the robust MS structure with grouting bolt. For the above purpose 3 ph, 440 volt. with auto cut facility, pressure indicator. 5-20 gal capacity, with tubing connection.
9. The furnace should be equipped with duplex "K" type thermocouple with SS sheath for control and Data acquisition system. An independent separate thermocouple should be kept inside for safety purpose. Furthermore, four extra thermocouples (K type) should be provided having data recording capability via Data Acquisition system.
10. The Furnace should be capable to Ramp of heating rate from 2°C to 5°C per minute & cooling less than furnace normal rate of cooling. SS cover shell use to protect heat Convection and keep skin temp in normal range.
11. 2 nos. Argon gas inlet port passing through a flow meter to be placed in front position of

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the furnace , flow meter range 0 - 200ml/min.

12. Mechanism/Mechanical arrangement for external particulate matter addition within the prepared melt should be provided with the furnace.
13. **Safety:** Properly managed drainage system in case of metal leakage, Over Temperature protector, Thermocouple break save unit, Clear gas outlet, Power cut during pouring, Gas inlet flow meter, Front cage cover etc.
14. Heating Element should be spiral type Kanthal A1, equally distributed around the crucible.
15. **Insulation:** Alumina based bricks, light weight ceramic fiber board, blanket combination ensuring lower skin temperature at longer nonstop operation.
16. Fabrication will be by MS angle & sheet combination, outer shell will be covered by SS sheet.
17. **Branded PC make:** HP/LENOVO/DEL to be provided for controlling the Furnace with following configuration:
CPU, USB & LAN port, Windows -10, RAM : 4 GB, 1 TB HDD, i7 8th generation key board, mouse, UPS and 20 – 22” monitor.
18. **Air Compressor :** 3 ph , 440 volt. >20 gal capacity with auto cut facility, pressure indicator, and filter. With tubing attachments & connection.
19. Installation and Commissioning should be performed by the vendor at CMERI site without any further charges, with one year warranty of the installed systems.
20. The bidder must have supplied atleast three non ferrous melting furnaces in last five years to government/private entities/establishments. The releavant P.O. copies should be enclosed along with the bid.

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22.10.2019

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22/10/19