INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076.

Ref No. (PR No. 1000050844) **(Rfx No. 6100002513)**

Technical Specifications : 1. High temperature muffle furnace (1800˚C) (Qty : 1)

Sr. No	Item Description	Detailed Technical Specification	Technical Compliance (Yes / No)	Additional Information (if any)
1.	**High temperature muffle furnace (1800˚C)**			
1.1	Furnace type	1800˚C chamber furnace, front loading, for scientific research.		
1.2	Mounting	Bench-top.		
1.3	Door design	Up and away, counter balanced door spring system for effortless door movement, with furnace refractory lining facing away from the operator at all times. Robust handles provided on both sides of the doorfor convenient grip with gloves. Door safety switch; disabling current to heating elements when the furnace door is open for protecting the operator.		
1.4	Volume (litre)	8 litres.		
1.5	Useful working chamber	200mm (H) X 200 mm (W) X 200 mm (D) (± 10 mm is allowed in each dimension subject to 8 litre volume).		
1.6	Maximum temperature capability	1800 °C with up to 10 hours of holding time at this temperature.		
1.7	Heat-up time (min.)	60 minutes or less to reach 1700°C.		
1.8	Temperature Control	1. Microprocessor /PID Multi programmable Controller 2. Touch-screen colour graphical display capable of showing temperature-time curves 3. At least 50 different programmes should be storable. Each programme should have capacity for 40 steps		

		4. Program status display with estimated end time and date 5. Parameterisation for the different processes should be possible 6. Power consumption during operation available on the display. 7. Remote control operation should be possible through PC 8. Online progress monitoring of furnaces should be on smartphone via app in English 9. Programme data should be downloadable to flash USB or Wi-Fi capable 10. Service information read-out via USB stick.		
1.9	Over-temperature protection	Over-temperature controller with alarm, preventing overheating of the workpiece or furnace.		
1.10	Heating elements type	High grade /high quality molybdenum disilicide heating element rated for 1900°C with very good protection against chemical reactions at T_{max} of 1800°C positioned on both sides of the hot-zone.		
1.11	Power supply	Compatible with normal 3-phase power supply in India (50 Hz) Power rating ≤ 5.5 KW Power driver unit using thyristor module (SCR).		
1.12	Thermocouple	Noble metal thermocouple (Pt/Pt-Rh) of temperature rating exceeding 1800°C.		
1.13	Insulation	Non-asbestos high quality ceramic fibre board,and top-grade insulation for faster cooling and compactness of the furnace, with high durability against spills and collisions.		
1.14	Table-top Furnace Construction	Epoxy painted steel body, and phosphate coated furnace outer case Galvanised steel inner case metal parts of the furnace Levelling feet pads for table-top usage Dual shell, bench top casing; low external temperatures and high inner temperature stability Adjustable supply air opening		
1.15	Ports and refractory plugs	A port should be provided for inserting user supplied thermocouple for measuring work piece temperature Protective gas connection for purging the furnace with non-flammable process gases Ports should be closed with refractory plugs when not in use.		
1.16	Gas Supply System	Gas Supply System should be provided for non-flammable gas (e.g. N_2/Ar) with rotameter. Protective gas connection for purging the furnace with non-flammable process gases		

1.17	Data recording and collection	Connectivity port for recording of process data in a computer with Wi-Fi or USB port (computer excluded from the scope of supply)		
1.18	External dimensions	Width <550 mm, Depth < 550 mm, Height < 700+ 400 mm (door closed + door open).		
1.19	Outside wall temperature	Less than 70°C when furnace is at 1800°C.		
1.20	Quality assurance certificates to be enclosed	ISO 9001:2015 or CE certification		
1.21	Delivery schedule	Within 10 weeks from the date of purchase order		
1.22	Warranty	1 year after installation		
1.23	Manual	Complete set of documented instruction manual in hard copy as well as softcopy, must be supplied with the furnace.		
1.24	Installation and Acceptance Testing	Free installation, commissioning and testing of the equipment at user site. Furnace performance as per specifications should be demonstrated.		
1.25	Training	One-time in-house training for two personnel for one day should be provided at no additional cost		