



**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY**  
**MATERIALS MANAGEMENT DIVISION**  
Powai, Mumbai - 400076

**Purchase Requisition No. 1000014137 (SRM / RFX No. 6100000324)**

**Chamber Furnace for Medical Applications**

**Requirement and Specifications**

**A. Manufacturing System**

1. Energy source: Inert gas based furnace
2. Process: Annealing
3. Built-in system to provide machining environment (heating element, insulation, electric voltages, software, Computer system, PID, Accessories, chiller unit, vacuum pump etc.)
4. Suitable for annealing of surgical instruments, Medical implants, tools, dies, etc.

**B. Furnace Geometry and Quality**

1. Chamber size: 350 mm x 350 mm x 300 mm (Height) or more
2. Maximum working temperature : 1200°C or more
3. Temperature accuracy:  $\pm 14^\circ\text{C}$  or lower

**C. Machine Tool**

1. Chamber type: Front Loaded
2. Water Cooling for Front Door
3. Air Cooled Furnace for surrounding area
4. Maximum sample loading capacity: 25Kg more
5. Machine type: Chamber type furnace
6. Overall machine size: 2500x2500x2500 mm or less
7. Controller: PID and auto tune system
8. Continuous working temperature: 1100°C or more
9. Heating Element: Non-Iron heating element
10. Thermocouple for temperature monitoring
11. Heating rate: 10°C/minute or more

12. Vacuum Pump capacity: -1Mpa or lower

**D. Inert Gas**

1. Inert gas environment: Argon

**E. Software**

1. Indicator for machining status.
2. Minimum 10" display for controller.
3. Temperature management with power interruptions
4. Indicator for machining time required (for a job), utilization, and remaining
5. Automatic log-keeping and display of all jobs done, and maintenance status
6. Indications and warnings for any mal-functioning (positioning, breakages, leakages, energy source, etc.
7. Tools and toolbox
8. Operation manual and detailed part drawings

**F. Warranty and Maintenance, commissioning, and accessories**

1. The supplier should provide the machine calibration certificates for different parameters like accuracy, repeatability, evaluation of thermal distortion, etc.
2. The supplier should provide certificates related to conformity with health, safety and environmental protection standards for machines.
3. The supplier should provide feedback about the machine from other customers from government institutes.
4. The supplier should be able to demonstrate the machine installed at other locations.
5. The supplier should provide purchase orders (including total cost) from at least three central govt. institutes.
6. There should be a service contract between machine manufacturer and supplier for 5 years, if applicable.
7. The supplier should mention all the standard accessories supplied along with machine
8. Working area of the machine should have safety enclosure.
9. Foundation kit like vibration mounting pads, bolts, etc. required for foundation to be supplied.
10. Detailed drawing of foundation indication necessary details to be supplied.
11. Requirements of water and compressed air lines to be specified (if required).

12. Special requirements like isolation, vibration criteria, air conditioning, dust free atmosphere, power requirements and flooring to be specified.
13. Calibration of the machine after Installation.
14. Supplier has to provide required training to engineers after installation of the machine in the following areas: Machine operation, PID Programming, mechanical maintenance, electrical and Controller maintenance, etc.
15. Three sets of the following documents in English are to be supplied with the machine: Operator manual, Programming manual, spare parts list, Maintenance manual, Electrical wiring diagrams, Preventive maintenance checklist, trouble shooting charts and guidelines. Machine test charts, Machine assembly drawings, Documents of all the bought out items, etc.
16. Supplier should have installed similar or better configuration machines in at-least 05 locations in India, and should provide their contact details.
17. The OEM should ensure continued supply of spares throughout the useful life of the machine, but not less than 15 years.
18. Comprehensive (hardware and software) warranty for five years after commissioning.
19. If the system remains down (non-functional) for 15 days after filing of complaint the warranty period to be extended for period between dates of reported problem and fixing.
20. Free upgrades of software for five years after commissioning.
21. Complete set of safety equipment needs to be provided along with the machine.
22. Complete installation of the overall system at the installation site.
23. Kits of spare parts – A kit of spare parts for maintenance of the machine for a period of 5 years operation should be quoted

**G. Evidence to the following parameters should be submitted along with the technical bids-**

1. Temperature Accuracy
2. Repeatability
3. Inert Environment
4. Uniform Temperature
5. Health and electrical safety