



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076

PR No. 1000014117 (Rfx No. 6100000327)

Detailed Technical Specifications for Injection Moulding Machine System for Medical Applications

Requirement and Specifications

A. Manufacturing System

1. Energy source: High pressure injection using hydraulics
2. Process: Injection molding/melting or equivalent
3. Built-in system to provide manufacturing environment (compressor, ram and plunger, heating section, hopper)
4. Suitable for surgical instruments, diagnostic devices, dental and orthopaedic instruments

B. Material and Part Geometry

1. Part material: All types of biocompatible polymers, ABS, Nylon, Polypropylene, etc.
2. Part materials: ISO/ASTM certified, sterilisable/autoclavable for direct use in human body
3. Possibility of using similar materials from third parties
4. Parting surfaces should be easy to clean
5. Surface roughness: Less than Ra 5 microns
6. Dimensional accuracy: At least 99.9%
7. Density of parts: 99.9% or more (compared to solid material)

C. Machine Tool - Horizontal Injection Molding

1. Max. mould height: 300 mm or more
2. Min. mould height: 100 mm or more
3. Toggle stroke: 250 mm or more
4. Clamping force: 50 Tone or more
5. Tie bar distance W x L (mm): At least 250 x 250 mm
6. Platen Dimensions W x L (mm): 600 x 600 mm or less
7. Min. mold thickness + max. stroke: 300 mm or higher
8. Max. mold thickness: 300 mm or more
9. Plasticization and Injection System: Screw pre-plasticizing



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10. Injection pressure: 150 MPa or more
11. Theoretical injection volume: 50 cm³ or higher
12. Injection rate: 125 cm³/s or higher
13. Injection speed: At least 125 mm/s
14. Plasticating capacity: 5 kg/h or more
15. Machine size L×W×H: 4000 x 1500 x 2100 mm or less
16. Machine weight: 3000 kg or less

D. 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 along with financial bid.
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 with transparent windows.
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.
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, mechanical maintenance, electrical and control system, 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.



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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, if any
21. Complete set of machining tools needs to be provided along with the machine.
22. Complete installation of the overall system including loading/unloading 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

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

1. Dimensional accuracy
2. Repeatability
3. Positional accuracy
4. Surface finish
5. Health and electrical safety