**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY**
**MATERIALS MANAGEMENT DIVISION**
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# Technical Specifications for Micro Conical Twin Screw Extruder with GMPMicro Injection Molding System

| S.NO | DESCRIPTION |
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| 1 | The conical twin-screw extruder must be a horizontal barrel type to simulate a production scale twin-screw extruder |
| 2 | It is mandatory for the extruder to have a removable top barrel assembly for easy cleaning and making sure that left-over ingredients and byproducts from previous batch are thoroughly cleaned by using appropriate cleaning tools &/or immersing the barrel in mild solvents/cleaning solutions. |
| 3 | It is mandatory that the mixing screws must be removable as well for easy cleaning. |
| 4 | The extruder must have a recirculating backflow channel for material recirculation to achieve efficient mixing and to control residence time precisely. |
| 5 | Max. torque per screw: 5 Nm or more |
| 6 | Controllable twin screw speed: from 2 RPM to 360 RPM or more. |
| 7 | Mandatory co-rotating mixing screws are required |
| 8 | Temperature of extruder: 300oC or more. |
| 9 | Pressure rating for barrel: 200 bars or more |
| 10 | Mandatory requirement of material of construction of screws and barrel: Plastic Mold steel (M340) grade or equivalent with a Hardness of 58 HRC or more. |
| 11 | The extruder must have a PC based control with appropriate data acquisition software for running the equipment, so that it will have the control software for running/controlling the extruder and recording data such as torque, RPM /speed, melt temperature from a mixing experiment. |
| 12 | The extruder must have a manual feed hopper for feeding of sample into the extruder. |
| 13 | Feeder: Both manual and forced feeder with vertical screw driven force feeder for continuous introducing of sample material |
| 14 | Conveyor system: Equipped with conveyor belt of minimum length of 500 mm with belt material of silicone rubber or equivalent. The speed of conveyor belt should be within 0.08 … 2 m/min |
| 15 | The extruder must be supplied with the following dies: |
| | a. Set of rod dies with 0.5, 1.0, 1.5 and 2.0 mm diameter. |
| | b. Slit Die with dimensions: 5 mm x 0.5 mm |

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| | c. Micro tubing die with Outer diameter: 2.5 mm, Inner diameter: 1.6 mm with electrical heating by temperature controller. |
| 16 | Extruder must have a provision to be connected to a Micro Injection Molding system direct melt transfer for the preparation of different types of sample specimens for common mechanical testing. |
| **Technical Specification of GMP Injection Molding System:** | |
| 17 | Piston based vertical injection molding machine |
| 18 | Adapter to allow transferring sample material from extruder directly into the injection molding container. |
| 19 | Injection volume from 2 ml up to 12.5 ml |
| 20 | Max. melt temperature: 450 °C or more |
| 21 | Max. mold temperature: 250 °C or more |
| 22 | Max. Injection pressure: 1200 bar or more |
| 23 | Molds: Mold for Tensile bar as per ISO527-2-1BA |
| 24 | Extra blank mould |
| 25 | Izod 180, charpy Iso179-1 mold |
| **Eligibility Criteria for bidders:** | |
| 1 | The bidder must have supplied at least 3 units of the quoted or similar model of Micro Twin screw extruder and Micro Injection Moulding machine to at least three GoI institutes IITs, IISc, DRDO, CSIR labs etc. in the last 5 years. |
| 2 | The bidder must attach along with their technical bid the completion reports of the supplied and installed equipment's. |
| **Warranty** | |
| • | The bidder must provide 2 years of warranty for the equipment from the date of installation. |