

**INDIAN INSTITUTE OF TECHNOLOGY DELHI  
HAUZ KHAS NEW DELHI**

Date: 28-06-12

**Notice Inviting Quotation**

Quotations are invited for the purchase of **Bench top parallel co-rotating twin screw extruder** for the Department of Textile Technology. Interested suppliers are required to submit their quotations as per the specifications given below. The sealed quotations are to be submitted in two Separate envelopes:

**A- for Technical Quote (to submit design) &  
B- for Financial Quote  
(For details, see Annexure I)**

Both these envelopes should be further enclosed in an outer envelope, which should also be sealed and addressed to, clearly mentioning on top right corner of the envelope "Quotations for **Bench top parallel co-rotating twin screw extruder**".

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Professor  
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IIT, Hauz Khas, New Delhi 110016**

The quotations should reach the above office by 24-07-12. If needed the suppliers may be asked to make a technical presentation before the committee.

Institute reserves the right to accept or reject any of the offers without assigning any reasons.

**The Twin Screw Extruder should have the following features:**

<b>S.No.</b>	<b>Criteria.</b>	<b>Specification</b>
1	<b>Type</b>	Bench top designed Parallel Co-Rotating Twin Screw Extruder with digital control and data logging software
2	<b>Design &amp; Construction</b>	<ul style="list-style-type: none"><li>• Made of material with high corrosion resistance</li><li>• Segmented screw configuration</li><li>• Horizontally split Barrel construction with easily removable top half barrel for easy cleaning</li><li>• Provision for reduction of processing length of the extruder by reduction kit</li><li>• Water cooled primary feed zone</li><li>• Additional closable multi function barrel ports suitable for additional feeding or venting</li><li>• Barrel split into a minimum of 8 (1+ 7 heating) zones to facilitate variable temperature profiles along the</li></ul>

		<p>barrel</p> <ul style="list-style-type: none"> <li>Extruder with a set of configured screw shafts, venting adapter, transducers for pressure &amp; melting temperature</li> </ul>
3	<b>Extruder</b>	<p>The extruder must meet the following specifications:  Should be able to process commercial chips of large sizes, <math>\geq 2.5</math> mm  Barrel diameter: <math>\leq 11</math> mm  Barrel length: <math>L/D \geq 40</math>  Heating zones: <math>\geq 7</math>, Electrically Heated &amp; suitably placed underneath to facilitate the opening of split barrel  Maximum Screw speed: <math>\geq 1000</math> rpm  Torque per shaft: Minimum 6 Nm, constant torque,  Pressure: 100 bar or above  Die: Rod die, <math>1 \times D: 2</math> mm or more,  Suitable for high temperature processing; Maximum Temperature: <math>\geq 450</math> °C  Throughput : Minimum sample size <math>\leq 30</math> g/h  Maximum sample size <math>\geq 1.5</math> kg/h with variable throughput in the above range</p>
4	<b>Extruder Control</b>	<p>The extruder should be controlled via touch screen with integrated feeder control and should monitor the following parameters</p> <ul style="list-style-type: none"> <li>Extruder speed (rpm)</li> <li>Extruder torque (%)</li> <li>Barrel temperatures (Deg. C)</li> <li>Pressure (bar)</li> <li>Volumetric feeder speed (%)</li> <li>Other controllable parameters must be specified</li> </ul>
5	<b>Chiller</b>	Chiller unit, 230 V suitable for the above extruder
6	<b>Volumetric Single Screw Feeder with feeder screws</b>	<ul style="list-style-type: none"> <li>Two feeders required</li> <li>First feeder should feed both Powder &amp; pellets into main &amp; secondary feeding port</li> <li>Second feeder should feed powder samples into secondary feeding port</li> <li>Multiple feeders should be able to get connected &amp; recognized and operated by Extruder Touch Screen</li> <li>For easy control &amp; compact system, the feeder should be designed to be located on the extruder housing &amp; connected electrically to extruder base</li> <li>Different feed screws must be provided to allow various feed ranges for different materials</li> <li>Twin lead feeder screw suitable with core for</li> </ul>

		minimal output with accuracy of feeding $\leq 3\%$ for powder materials
7	<b>Compatibility</b>	Should be compatible with existing mini injection molding machine, Minijet. Suitable adapters should also be provided for direct feeding into the above machine.
8	<b>Liquid feeding Port</b>	Should allow the feeding of liquid into any of the downstream feed ports
9	<b>Vacuum Stack</b>	For applying vacuum to the extruder for removal of volatile impurities
10	Screw Element Flexibility Kit	At least the following set of common screw configuration be provided <ul style="list-style-type: none"> <li>• 4 x Feed Screw, 1 L/D</li> <li>• 2 x Feed Screw, 0.5 L/D</li> <li>• 2 x Reverse Feed Screw, 0.5 L/D</li> <li>• 8 x Mixing Element 0°, 0.25L/D</li> <li>• 8 x Mixing Element 90°, 0.25L/D</li> </ul> Anti- Seize paste
11	Accessories must be quoted	a) Screw length Adjustment Kit <ul style="list-style-type: none"> <li>• Should have a set of shaft sleeves which allows the shortening of screw configuration p 30,25,15 or 10 L/D</li> </ul> (b) Fully ported barrel <ul style="list-style-type: none"> <li>• Additional top barrel with at least 6 combined feed/vented port to give maximum flexibility to locate additional feeding or venting connectors</li> <li>• Should include additional port plugs</li> </ul>
10	<b>Optional Accessories</b>	(a) Water bath (b) Thermo gravimetric feeder (If available) (c) Set of Die inserts for different L/D (d) Liquid Feed System <ul style="list-style-type: none"> <li>• Should contain complete solution to feed liquid to barrel</li> <li>• Feed pump must be controlled digitally at the pump user interface &amp; should be interlocked with Extruder start/stop signals</li> </ul> (e) pelletizer <ul style="list-style-type: none"> <li>• Bench top strand pelletizer with variable speed drive control with pellet length flexibility from 1- 2 mm</li> <li>• Access for easy cleaning with open panel with safety interlock</li> </ul>

7	<b>Quality</b>	<ul style="list-style-type: none"> <li>• Internationally known brand</li> <li>• Model with above specifications must have been sold to at least one reputed organization in India or abroad</li> <li>• Provide name, email ids of users of the quoted models as above</li> </ul>
11	<b>Warranty/Terms</b>	<ul style="list-style-type: none"> <li>• Minimum comprehensive 1 year on non-consumable parts must be offered and quoted</li> <li>• 4 years extended warranty must be quoted separately</li> </ul>
12	<b>Technical support</b>	<ul style="list-style-type: none"> <li>• The manufacturing company should have well established network base in India to install, maintain and repair supplied items on long term basis</li> <li>• Provide name of Engineer in Delhi NCR Region who has been trained to repair this machine, if available.</li> </ul>

## Terms and Conditions

### Annexure I

**Envelop A: Technical Quote: The following details are to be enclosed** (*Mention clearly on this envelop – Technical Quote*)

1. All quoted models must be compatible with Indian power supply: 220 Volts/50Hz for single phase and 440 V/50Hz for three phase supply.
2. Quotation should be directly from Original manufacturer or authorized sales agent.
3. Sole agency certificate (if applicable) and its validity from Foreign Principals (in case of foreign manufacturer),
4. **Proprietary certificate** (if applicable, for any component or instrument quoted).
5. Delivery period should be specifically mentioned and should be as small as possible.
6. Any optional equipment/accessory advised for better functioning of equipment must be specified and quoted separately.
7. Details on installation, commissioning and **training of the equipment** must be specified.

8. **List of references** of users of the quoted equipment must be submitted with complete postal address, email address, Tel. No. and name of the user(s).
9. State **service support** for the equipment in India, specifically in Delhi/NCR; give details of service centers with address, telephone numbers and name of service engineers available, **response time** during warranty and afterwards.
10. Refurbished and models on the verge of being phased out should not be quoted.
11. **Certificate of compliance** with deviations from specification (if any) must be attached.
12. **Original brochures and original specification sheets (from equipment manuals)** directly obtained from the principal manufacturer of the quoted model must be enclosed **along with supporting data**.

**Envelop B: Financial Quote: The following details are to be enclosed/ ensured.** (*Mention clearly on this envelop – Financial Quote*)

1. Prices of the quoted model should be both FOB & CIF Delhi and include all taxes, delivery, installation and onsite training charges. Please note that IIT Delhi is exempt from central excise and custom duty. Institute also provides 'I' education form against concessional VAT for interstate transactions.
2. The products will be used for educational purposes. Any applicable academic institution discounts should be offered and stated.
3. Guarantee or warranty conditions must be clearly specified; exemptions if any must be clearly stated.
4. Service charges per visit and AMC after extended warranty period must be specified.
5. Validity of quotation must be at least 90 days from the date of quotation.
6. Mode of payment is through LC only for foreign purchases (advance payment is not permissible), **preferably** split into two installments: 80% on dispatch through LC and 20% on successful installation at IIT Delhi through draft in foreign currency to the foreign principal or in Indian currency to the local agent (as applicable). Name and address of the company on whose name the LC is to be opened should be clearly mentioned.
7. Supplier must submit TIN number/PAN number as applicable.
8. Institute reserves the right to order equipment with better quality over lower price and to accept or reject any or all the quotations without assigning reasons thereof.