

	<p>Hkkjrh; izkSjksfxdh laLFkku enzkl psUuS 600 036  <b>INDIAN INSTITUTE OF TECHNOLOGY MADRAS Chennai 600 036</b>  HkaMkj ,oa Ø; vuqHkkx  <b>STORES &amp; PURCHASE SECTION</b>  nwjHkk" k% ¼044½ 2257 8285@8286@8287@8288 QSDI% ¼044½ 2257  8292@2257 8082  Telephone : (044) 2257 8293,8287,8285,8286  email ID- <a href="mailto:adstores@iitm.ac.in">adstores@iitm.ac.in</a></p>	
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A.V. Sudarsanam

Dated : 26.02.2013

Deputy Registrar (Stores & Purchase) i/c

Tender No. **SPS/MET/HTMTM/002/2012-13**

**Due Date: 18.03.2013  
before 2.00 p.m**

Dear Sirs,

1. On behalf of the Indian Institute of Technology Madras, I invite you to tender for supply of the following item **under Two bid system from OEM only.**

Item
<b>High Temperature (upto 1200°C) Mechanical Testing Machine</b>

confirming to the specifications enclosed.

<b>A.</b>	<b>LAST DATE for receipt of Tender</b>	: <b>18.03.2013 before 2.00 p.m</b>
	<b>Submission of Tender</b>	<p>: Both Technical Bid &amp; Price Bid should be in separate cover with specification on the cover as <b>“Technical Bid” &amp; “Price Bid”</b> as the case may be.</p> <p>Both the independent covers should be placed in one big cover and sealed with the superscription on the left hand side <b>OPEN TENDER FOR SUPPLY OF High Temperature (upto 1200°C) Mechanical Testing Machine</b> due on <b>18.03.2013 at 2.00 p.m.</b>  The tender cover should be sent to:</p> <p style="text-align: center;"><b>Ms. V.G. BHOOMA, IRPS  REGISTRAR  INDIAN INSTITUTE OF TECHNOLOGY MADRAS  CHENNAI-600 036</b></p> <p>Right is reserved to ignore any tender which fails to comply with the above instructions.  <b>Tender should be sent either by REGISTERED POST ACKNOWLEDGEMENT DUE OR THROUGH MESSENGER.</b> If the Tender is sent through Messenger, the same has to be dropped in the <b>TENDER BOX</b> marked <b>Stores &amp; Purchase</b> kept for this purpose in the <b>REGISTRAR'S OFFICE (1st Floor of Administrative Building)</b> before 2.00 PM on due date <b>18.03.2013.</b></p> <p>If it is by post (Registered Post or Speed post only) the same should reach before 2.00 p.m. i.e on the last date <b>18.03.2013</b> otherwise it will be summarily rejected.</p> <p><b>THE INSTITUTE SHALL NOT BE RESPONSIBLE FOR THE LATE RECEIPT OF TENDER ON ACCOUNT OF POSTAL OR ANY OTHER DELAY. THE TENDER BOX WILL BE CLOSED EXACTLY AT 2 P.M. ON 18.03.2013 SHARP.</b></p>

<b>B.</b>	<b>Earnest Money Deposit (EMD)</b>	:	<ul style="list-style-type: none"> <li>☞ EMD @ 2% of the equipment value quoted has to be paid along with the tender</li> <li>☞ To be calculated based on the highest value quoted, among all configurations, by the bidder.</li> <li>☞ The EMD amount up to 20 Lakhs is to be given in the form of DD from a nationalized bank</li> <li>☞ Performance guarantee @3% of the equipment value quoted has to be submitted by way of bank guarantee <b>by the successful bidder only.</b></li> <li>☞ Demand Draft may be drawn in favour of <b>“The Registrar, IIT Madras”</b> payable at Chennai.</li> <li>☞ <b>The EMD should be put in a separate cover and should be enclosed in the technical bid cover only, else the bid is likely to be rejected due to non-enclosure of EMD. The EMD cover will be opened along with the commercial bid only after technical evaluation of the bids</b></li> </ul>
<b>C.</b>	<b>Marking on Technical Bid</b>	:	<ul style="list-style-type: none"> <li>➤ For each item/configuration separate Technical Bid envelope should be used.</li> <li>➤ The technical bid cover of the various items should clearly be marked with the <b>item name.</b></li> <li>➤ The technical bid covers of the various items should be put into one big cover <b>superscribed “Technical Bid”.</b></li> <li>➤ All technical bid should have the page-wise <b>heading as “Technical Bid” and page no.</b> in all pages with seal and signature of authorized signatory. The total no. of pages should be mentioned at the last page of the documents.</li> </ul>
<b>D.</b>	<b>Marking on Price Bid</b>	:	<ul style="list-style-type: none"> <li>➤ For each item/configuration separate Price Bid envelop should be used.</li> <li>➤ The price bid cover of the various items should clearly be marked with the <b>item name.</b></li> <li>➤ The price bid covers of the various items should be put into one big cover <b>superscribed “Price Bid”.</b></li> <li>➤ All financial bid should have the page-wise <b>heading as “Financial Bid” and page no.</b> in all pages with seal and signature of authorized signatory. The total no. of pages should be mentioned at the last page of the documents.</li> </ul>
<b>E.</b>	<b>Agency Commission</b>		<ul style="list-style-type: none"> <li>➤ The financial bid should clearly state (below the total price quoted) if the quoted amount includes agency commission.</li> <li>➤ If yes, state the percentage of commission.</li> <li>➤ This will be paid in INR only after satisfactory installation.</li> <li>➤ The quote value + agency commission, if any, will be taken for comparison purpose.</li> </ul>
<b>F.</b>	<b>Tender document fee</b>		<ul style="list-style-type: none"> <li>➤ <b>The tender document fee of Rs.525/-(inclusive of VAT @ 5%) (Non-refundable)</b> should be drawn in the form of DD (obtained on or after the date of advertisement) in favour of “The Registrar, IIT Madras” payable at Chennai, and the same should be enclosed <b>only in the technical bid cover.</b></li> <li>➤ No separate tender documents will be issued by us. The same can be downloaded from our institute website: <a href="http://tenders.iitm.ac.in">http://tenders.iitm.ac.in</a></li> </ul>
<b>G.</b>	<b>For all the imported components</b>		<ul style="list-style-type: none"> <li>➤ Quote should be in US dollars.</li> </ul>

2.	<p><b>Preparation of Tender:</b></p> <p>a) The Schedule to the Tender form should be returned intact whether you are quoting for any item or not. Pages should not be detached and when items are not being tendered for, the corresponding space should be defaced by some such words as 'not quoting'.</p> <p>b) In the event of space on the schedule form being insufficient for the required purpose, you have to submit the rates in the letter head of your company clearly mentioning S.No. and other relevant particulars. Each such additional page must be numbered consecutively, bear the Tender Number and be fully signed by you. In such cases reference to the additional pages must be made in the tender form.</p> <p>c) If any modification of the schedule is considered necessary, you should communicate the same by means of a separate letter sent with the Tender within due date.</p> <p>d) You should quote your product as per our specification requirements by mentioning our requirements and your offer side by side and the rate should be in total as per our requirements. We will not make any calculation if you have mentioned the rates of items separately.</p> <p>e) In case, your product specification does not exactly match our requirements, you may quote for your product, but you must highlight the deviation in specification point by point.</p> <p>f) If you need to add any item to your system in order to meet our specification requirements, you are required to quote for your basic system separately and also to quote the total value of the system including the option required to suit our requirements. Otherwise, your tender will not be considered at all.</p> <p>g) Wherever applicable you are required to clearly indicate the Part No./Model No./Brand Name etc. If such details are not included, it will be presumed that your offer is not for branded item, but for generic only, and compared accordingly.</p> <p>h) The offer/bids should be submitted in two bid system i.e. Technical Bid and Price Bid in a separate cover. The technical bid should consist of all technical details along with catalogue, commercial terms and conditions. Financial bid should indicate item-wise price for all the items mentioned in the technical bid.</p> <p>i) The Technical bid cover will be first opened and evaluated. In the primary screening, technical bid of only those who satisfy the eligibility criteria will be evaluated. The Price bid of only those bidders whose technical bid is found to be technically adequate by the Committee will be opened.</p>
3.	<p><b>Signing of Tender:</b></p> <p>The Tender is liable to be rejected if complete information is not given therein or if the particulars and date (if any) asked for in the schedule to the Tender are not fully filled in or not duly signed/authenticated. Specific attention is drawn to the delivery dates and important conditions referred to in Annexure enclosed herewith. <b>Each page of the tender documents required to be signed and bears the official seal of the tenderers.</b></p>
4.	<p><b>Period for which the offer will remain open:</b></p> <p>(i). Firms tendering should note the period for which it is desired that their offers should remain open for acceptance. If the firms are unable to keep their offers open for the specified period they should specifically state the period for which their offers are being considered provided, however, the day up to which the offer is to remain open being declared closed holiday for the Indian Institute of Technology Madras, the offer shall remain open for acceptance till the next working day.</p> <p>(ii). Quotations qualified by such vague and indefinite expressions such as 'subject to immediate acceptance', 'subject to prior sale' will not be considered.</p>
5.	<p><b>Opening of Tenders:</b></p> <p>You are at liberty to be present or authorize a representative to be present at the opening of the tender at the time and date specified in the Schedule.</p>

6.	<p><b>Prices:</b></p> <p>The prices quoted must be net per unit shown in the schedule and must include all packing and delivery charges and other statutory levies. Refund on account of returnable packages (if any) are to be separately specified. Price and refunds must be clearly shown in figures and worked in Indian currency. <b>The prices quoted by the Tenderer should be inclusive of Sales Tax/VAT and other statutory levies</b> (and should be clearly stated to be so) which will be paid by the Purchaser/if legally leviable at the rate ruling on the date of supply as specified in the Acceptance of Tender. <b>The percentage of tax etc. included in the price should be indicated in clear terms. If the inclusive price is not given, we will treat your offered rate as inclusive rate and comparison be made with others.</b> If at the time of comparison of your offer without taxes etc. is happen to be lowest, you are bound to supply as per the offered rate, i.e. without taxes etc.</p> <p>Hence you are requested to be careful while quoting for tender. <b>The price should be without customs duty and excise duty since IIT Madras is fully exempted from payment of excise duties and also eligible for payment of concessional customs duty against submission of Essentiality Certificate. The customs duty will be payable / reimbursable by us at the time of clearance on production of necessary proof. Hence these duties need not be included in the price while quoting.</b> Necessary document will be provided at appropriate time. <b>No price revision, changes in the specification already given or changes in the terms and conditions etc. during the period is acceptable.</b></p> <p><b>We are eligible for concessional VAT/CST on submission of concessional certificate. The Institute is not authorized to issue C or D forms of Sales tax certificate. Hence VAT/CST should be charged at concessional rates as applicable to educational and research institutions run without profit motives, for which necessary certificate will be issued on demand at the time of retirement of documents/payment, wherever applicable.</b></p>
7.	<p><b>Terms of Delivery:</b></p> <p>Supply, Installation and Commissioning are required by date(s) specified in the Schedule of Tender. If, however, it is not possible for you to effect supply, installation and commissioning by the date(s), you should specify the date(s) by which you can guarantee supply, installation and commissioning in the prescribed schedule to the Tender.</p>
8.	<p><b>Right of Acceptance:</b></p> <p>The Indian Institute of Technology Madras, Chennai-600 036 does not pledge itself to accepting the whole or any part of the Tender or portion of the quantity offered.</p>
9.	<p><b>Communication of Acceptance:</b></p> <p>Acceptance by the Purchaser will be communicated by Post, if required, and the Company's acceptance communicated to us formally in writing. In case where acceptance is communicated by Telegram or letter by Speed Post, the formal Acceptance of Tender will be forwarded to you as soon as possible but the instructions contained in the Telegram or Speed Post letter should be accepted upon immediately.</p>
10.	<p><b>The Institute shall not be responsible for the late receipt of tender documents due to postal and or any other delay.</b></p>

Yours faithfully,

Deputy Registrar (Stores & Purchase Section) i/c

Indian Institute of Technology Madras, Chennai 600 036 Stores & Purchase Section				
<b>SCHEDULE TO INVITATION OF TENDER NO</b>		:	<b>SPS/MET/HTMTM/002/2012-13</b>	
<b>LAST DATE &amp; TIME FOR RECEIPT OF TENDER</b>		:	<b>18.03.2013 at 2.00 p.m.</b>	
<b>TIME &amp; DATE OF OPENING OF TENDER</b>		:	<b>18.03.2013 at 3.00 p.m.</b>	
In the event of the date of opening of tender being declared a closed holiday for the Indian Institute of Technology Madras the due date for opening will be following working day.				
The Tender shall remain open for acceptance/validity till: <b>30.06.2013</b>				
S.No.	Description	Quantity	Price	
			US Dollars	In Indian Rupee
<b>As per the specifications (page 9 to 12 at the end) and terms &amp; conditions (page 12 &amp; 13 ) at the end attached herewith</b>				
<b>IMPORTANT TO NOTE:</b>				
<ol style="list-style-type: none"> <li>1. All tender documents should be filled in signed and returned.</li> <li>2. Tenderer must state categorically whether or not his offer is exact to tender specifications and indicate deviations, if any failing which his offer will be ignored.</li> <li>3. Your offer should be accompanied by catalogue of the equipments.</li> <li>4. Delivery should be effected within the time frame as given in Important Condition No.7</li> <li>5. <b><i>FAX/Email/Telegram quotations will not be accepted.</i></b></li> </ol>				
<b>NOTE: ONE AGENT CAN NOT REPRESENT FOR TWO SUPPLIERS OR QUOTE ON THEIR BEHALF AT ONE TIME IN THE SAME TENDER.</b> In case of import all the particulars required for opening Letter of Credit should be furnished in clear terms. After opening of L/C, based on our tender, no more requests for amendment of L/C will be entertained.				
Total inclusive price to be quoted should be in nearest Rupee (Supply, installation and commissioning at IIT Madras).				
<b>IMPORTANT CONDITIONS:</b>				
The following instructions are to be followed meticulously <b>FAILING WHICH YOUR OFFER WILL NOT BE CONSIDERED:</b>				
1.	Please mention the Part No., Model No. & Make wherever required and also CST/VAT No and Area Code failing which your quotation will be rejected. All of your future correspondences including Invoices should bear the CST/VAT No. and Area Code.			
2.	Withdrawal of a Model quoted is acceptable ONLY IF accompanied by a certificate from the manufacturer to that effect. Correspondence in this connection must be addressed to DR (Stores & Purchase). The offer of higher configuration in lieu of withdrawal model will be accepted only if there is no change in the price offered.			
3.	<b>Quotations should be submitted in Arrack Sealed Cover (Sealing Wax).</b> The quotation should be typed in the space provided in the downloaded format only. No manual entries are accepted and this will be rejected at the opening stage itself. Quotes given by the tenderers in their own format/letter heads will not be considered at all.			
4.	Warranty should be in clear terms. Indicate price change (if any) for extra year warranty.			
5.	In case of Import, the Insurance & Freight Charges should not exceed 6% of FOB Value. You are requested to quote FOB price as well as CIF, CHENNAI mentioning Freight & Insurance charges separately. <b>No Ex-Works pricing is considered.</b>			
6.	Quotations will be accepted only from manufacturers for branded items. If they are not in a position to			

	<p>quote, they may authorize only one exclusive Accredited Resellers/Channel Partners/Deluxe Premium Service Partners, who may quote along with proof for authorization.</p> <ol style="list-style-type: none"> <li>Two bid processes (separate sealed envelopes of technical and financial bids in the cover) is open to original equipment manufacturers (OEMs) only. Each OEM can, however, nominate <b>one</b> third party agent (TPA) to represent them during the bidding process. Either the Indian Agent on behalf of principal / OEM or the principal itself can bid but both cannot bid simultaneously for the same item / product in the same tender.</li> <li>Documentary evidence for the following shall be included along with the covering letter. <ol style="list-style-type: none"> <li>TPA shall produce authorization from the OEM they represent.</li> <li>OEM / TPA shall be an ISO certified company.</li> </ol> </li> </ol>
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7.	<p><b>Delivery Period for Import &amp; Indigenous Items:</b></p> <p>For Indigenous Items: Items should be delivered within a week's time. No further extension of time will be allowed.</p> <p>For Import Items: The order acknowledgement should be issued by Fax within 3 days, and the item should be airlifted within 15 days from the date of receipt of the Letter of Credit copy / copy of DD, as the case may be.</p> <p>Non delivery of items will lead to cancellation of Purchase Order without any notice. In addition, action may be taken for removing them from our mailing list in respect of future enquiry.</p>
8.	<p>IIT Madras is exempted from the Payment of Excise Duty and also eligible for payment of concessional customs duty against submission of Essentiality Certificate. I.I.T. will make necessary arrangements for the clearance of imported goods at Airport. Hence, the price should not include the above charges.</p>
9.	<p><b>No Advance Payment will be made for Indigenous purchase.</b> 100% Payment against Delivery and satisfactorily installation for local purchase can be agreed to. In respect of Import, Demand Draft can be drawn against Proforma Invoice on an undertaking from the principal that the items will be exported within 10 days. Demand Draft will be drawn, and copy of the same will be given to you as proof, and the actual DD will be handed over to you on satisfactory installation of the systems. Otherwise 90% payment will be made by Letter of Credit and balance 10% will be paid only after satisfactory installation and commissioning on the same LC. <b>Demurrage charges (if any) will be deducted from the balance 10%.</b> Initial opening of Letter of Credit charges will be borne by us. If any amendment is requested for, the charges for the amendment will be borne by the supplier only. Hence, care should be taken in all respects before opening of Letter of Credit.</p>
10.	<p>Item should be commissioned immediately after receipt of item failing which legal action will be taken against the successful bidder.</p>
11.	<p><b>You must give an undertaking to the effect that "in case of downward price movements during the period, the firm promises to pass on the advantage to IIT Madras".</b> Your quotation will be summarily rejected, if the undertaking does not accompany the quotation.</p>

**Deputy Registrar**  
**(Stores & Purchase Section) i/c**

## ANNEXURE

### INSTRUCTIONS & SPECIAL CONDITIONS

(To be returned by Tenderer along with the Tender duly signed)

1.	<p><b>GENERAL:</b> Tenderer should furnish a clear declaration as follows: We declare that I am/we are</p> <ul style="list-style-type: none"><li>i) Accredited Agents of the suppliers abroad;</li><li>ii) Authorized Agents of the Projects &amp; Equipment Corporation of India Ltd.,</li><li>iii) Eligible for import of Scientific Equipment from East European Countries;</li><li>iv) Holders in stock of the stores tendered for</li></ul> <p>(Strike out whichever is not applicable)</p>
2.	<p><b>CONDITIONS OF CONTRACT:</b> Printed or cyclostyled or such terms and conditions of the tenderer, not appearing in the body of the tender will not be considered as forming part of the tender. Tenderer should quote on the basis of the conditions referred to in Para of the invitation to tender and tender papers. In case these terms and conditions are not acceptable to the tenderer, he should specifically state the deviation(s) there from in the body of the tender.</p>
3.	<p><b>DEVIATION FROM SPECIFICATIONS:</b> It is in the interest of the tenderer to study the specifications in the tender schedule thoroughly before quoting so that, if any deviations are made by the tenderer, the same are prominently brought out in the body of the tender. If you need to add any optional items to your system in order to meet our specifications, you are requested to quote for the total including the option required to suit our requirements; otherwise, your tender will not be considered at all.</p>
4.	<p><b>PRICE:</b></p> <ul style="list-style-type: none"><li>i) Prices must be in Rupees and Paisa if the import is from the East European Countries. For import from General Currency Area, the price may be indicated in foreign Currency (both F.O.B. &amp; C.I.F. CHENNAI by Air/Sea). The price should be without Customs Duty and Excise Duty since IIT Madras is exempted from the payment of Excise Duties and also eligible for concessional Customs Duty against submission of Essentiality Certificate.</li><li>ii) <b>AGENCY COMMISSION [(Refer page no.2 (E))]</b></li><li>iii) The unit prices should be for the same unit as indicated in the Schedule to tender enquiry and not for any other unit.</li><li>iv) Prices quoted should be for supply, installation and commissioning in I.I.T. Madras.</li><li>v) Discount, if any, should be indicated prominently.</li><li>vi) Offers should normally be on firm price basis. If the tenderer cannot quote firm prices, variable prices with a ceiling have to be indicated. If the variation price be lower than the price stated in the quotation, the purchaser should have the benefit of lower price.</li></ul>
5.	<p><b>TRANSIT INSURANCE:</b> The Purchaser will not pay separately for Transit Insurance.</p>
6.	<p><b>PAYMENT:</b></p> <ul style="list-style-type: none"><li>i) Payment will be made only after completion of supply, installation and commissioning of the systems to the entire satisfaction of the Purchaser.</li><li>ii) If the payment is desired to be made to their Principals directly, the same will be made against Irrevocable Letter of Credit only. For more details, see the accompanying note on "Important Conditions".</li><li>iii) No Advance Payment will be made either for Indigenous Purchase or Import.</li></ul>

	iv) Advance dispatch details like Invoice copy, Airway Bill No., Packing List and flight No. should be sent immediately after shipment for early clearance and also make suitable arrangements for sending Cargo Arrival Notice (CAN) in time. <b>Demurrage charges, if any, on account of delay in receipt of above will be debited to supplier's account.</b>
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7.	<p><b>TENDERER SHALL SUBMIT ALONG WITH HIS TENDER:</b></p> <ul style="list-style-type: none"> <li>I. Submission of Income Tax clearance certificate is not required. However, they have to quote their PAN No.</li> <li>II. Name and full address of the Banker and their swift code.</li> <li>III. Proof of having ISO 9002 or other equivalent certification given by appropriate authorities.</li> <li>IV. Proof of registration with sales tax /VAT authorities like registration number, range etc. in clear terms.</li> </ul>
8.	<p><b>EARNEST MONEY DEPOSIT (EMD): Refer page no.2 (B)</b></p> <ul style="list-style-type: none"> <li>➤ This Earnest Money will be returned to the unsuccessful tenderers after the final disposal of the tenders. <b>EMD will not carry any interest.</b></li> <li>➤ The EMD will be retained in the case of successful tenderers till the warranty period.</li> <li>➤ EMD will not be waived under any circumstances.</li> <li>➤ EMD will be forfeited in the case of non-execution of the order within the due date.</li> <li>➤ <b>Non submission of EMD will lead to rejection of tender at the opening stage itself.</b></li> </ul>
9.	<p><b>DISTRIBUTORSHIP CERTIFICATE:</b></p> <p>Sole selling Agents/Distributors of a particular make should submit a Certificate from their Principals to the effect that they are the authorized Agents of the Manufacturers and that they are authorized to import and supply the equipment to IIT Madras.</p>
10.	<p><b>GUARANTEE:</b></p> <p>The tenderer has to declare that the goods sold to the buyer under this contract shall be of the best quality and workmanship and shall be strictly in accordance with the specifications. Tenderer should indicate the period for which the said goods/articles would continue to confirm to the specifications.</p>
11.	<p><b>JURISDICTION:</b></p> <p>All questions, disputes, or differences arising under, out of or in connection with the contract, if concluded, shall be subject to the exclusive jurisdiction at the place from which the acceptance of Tender is issued.</p>

### **ACKNOWLEDMENT**

It is hereby acknowledged that we have gone through all the points listed under "Instructions & Special Conditions" outlined above, and those in the accompanying note on "Important Conditions", and we agree to abide by them under the penalty of permanent disqualification for Tender participation and for related penal actions for non-abidance of the conditions.

**SIGNATURE OF TENDERER ALONG WITH  
SEAL OF THE COMPANY WITH DATE**



## **Technical Specifications for 100 kN High Temperature Testing Machine to Conduct Tensile and Compression Tests under Constant Strain Rate, Constant Strain and Constant Load Conditions**

### **100 kN Capacity Materials Testing System**

- ✚ High stiffness (frame axial stiffness >110 kN/mm) dual column floor standing electromechanical testing system that can be adjusted to ergonomic working position for the operator
- ✚ Testing speed range: 0.0001 to 1500 mm/min (0.000004 in/min to 59 in/min) steplessly adjustable without any limitations including full speed at full load capability.
- ✚ Vertical Test Space: >1750 mm without Grips
- ✚ Industry standard Ethernet interface to the computer for fast, reliable communication with laptop or desktop
- ✚ Integrated digital closed-loop control and data acquisition electronics including load measurement, crosshead extension and strain measurement channels.
- ✚ In addition, two input Sensor Conditioner Cards for additional measurements through transducers.
- ✚ Test control panel with results display, start, stop and return functions, programmable function keys, test status indicators, variable speed jog and specimen protection
- ✚ 24-bit resolution card with data acquisition rate of minimum 2 kHz simultaneously on load, extension, and strain channels.
- ✚ To save energy, the *Controller should* automatically switch to “economical mode” whenever is not being used.
- ✚ The controller should have data sampling rate of 400kHz or better.
- ✚ Position Measurement Accuracy: Better or equal to  $\pm 0.0002$  mm
- ✚ Load Measurement Accuracy: High precision auto-ranging load cell with very low nominal deformation of less than 0.5 mm and accuracy  $\pm 1\%$  of reading down to 1/500 of load cell capacity complying with ISO 7500-1
- ✚ Strain Measurement Accuracy: ASTM E83 Class B or ISO 9513 Class 1 extensometer
- ✚ Automatic recognition of capacity, calibration & safety limits.
- ✚ Rigid and play free connection to minimize bending moments
- ✚ Must fulfill all 5 criteria according to ISO 7500-1

### **Product Control Panel**

- ✚ Crosshead Jog with Fine Position to easily maneuver the frame crosshead with speed and precision & The Fine Positioning wheel on the Productivity Panel moves the frame in very small increments, allowing operators to load specimens without the risk of overloading them.
- ✚ Quick Start/Stop Buttons: for total control over testing with quick start and stop buttons. Users will have the ability to load a specimen and start a test without the use of a PC.

### **Protection of specimen and fixtures:**

- + Machine should have the capability of automatically adjusting the crosshead without damaging the specimen while gripping before the test commences.
- + Prevent overloading of specimens, fixtures, and load cells during crosshead adjustment

### **Wedge Grips:**

- + Simple, safe and quick operation, robust gripping system.
- + Capacity: 100 kN. Suitable for a large variety of materials.
- + Weight of each grip shall not exceed 13 kg.
- + The high temperature test accessories must be connected on to the system without removing any accessories for easy preparation for high temperature testing.

**For Flat specimens:** Separate sets of jaw inserts for flat specimens of thickness 0.5 to 12 mm

**For Round specimens:** Separate sets of jaw inserts for round specimens of diameter 4 to 19 mm

### **High-temperature furnace:**

3-zone High temperature furnace for determination of elastic behaviour, tensile strength and yield strength of materials at elevated temperature in air.

- + Min. temperature: 200°C and Max. temperature: 1200°C
- + Heating rate: 20 °C/min
- + Nominal power: 3.6 kW, and Nominal voltage: 3 x 240 V
- + Heating zones: 3
- + Temp Constancy:  $< \pm 2K$ , and Temperature Constancy zone: 200 mm
- + Inner diameter: ~100 mm
- + Heated length/zone: 300 mm
- + Temperature tolerance at the specimen at a length of 100 mm shall be  $\pm 2K$
- + Temperature constancy at the specimen shall be  $\pm 2K$  (according ASTM 139)
- + 3 channel PID controller with connection for 6 thermocouples (3 thermocouples for the Heating zones of the furnace and 3 thermocouples for the specimen)
- + Ability for digital display of temperature from all 6 thermocouples on monitor.
- + Interface for connection to the software
- + Swivel unit for furnace
- + The temperature controller should automatically set the control parameters for even temperature distribution along specimen and preventing temperature overshoots. Therefore there should not be any need for setting the PID factors by empirically established means for various temperatures.

High-temperature specimen holders that can withstand the above load capacity

High Temperature pin mounting grips for flats: Pair of high temperature pin mounting grips made of Inconel-713C or equivalent) for flat specimens, for testing specimens up to 5 mm thickness.

## **Strain Gauge Extensometer & Strain Card**

Strain Gauge Extensometer, 25 mm gauge length,  $\pm 20\%$  maximum strain.

A separate extensometer to work in the operating temperature range of  $200^{\circ}\text{C}$  -  $1000^{\circ}\text{C}$  shall be quoted.

Two additional sensor Conditioner Cards that should provide closed loop control and data acquisition capability for transducers.

**Optionally a high-resolution digital extensometer may be quoted for our consideration.**

- ✚ Digital extensometer with freely selectable Gauge lengths from 10 to 100 mm to suit the various test standards
- ✚ The extensometer arms must close automatically at start of test and open at sample break
- ✚ The resolution of the extensometer must be better than or equal to  $0.03\ \mu\text{m}$
- ✚ The gauge length must be automatically set as required by operator or according to the formula according to standards
- ✚ The extensometer must also be able to measure compressive and bending deflections
- ✚ Sensor Conditioner Card that should provide closed loop control and data acquisition capability for transducers.
- ✚ It should be possible to add an automatic digital transverse extensometer for measuring the  $r$ - value across the entire width of the sample.

## **Compression anvils for compression testing:**

A reversal cage arrangement (made of superalloys) for the high temperature compression testing.

Able to conduct testing on compression specimens in the size range of 3mm to 15mm.

## **Advanced Material Testing Software:**

- ✚ The software package should meet the needs of a wide variety of applications (ex: Metals including strips wires etc.).
- ✚ Should have the capability for tension, compression, flexure, tear, adhesion, and **test control based on extension, load or strain.**
- ✚ The software should have the capability to save the test method along with the start position, limit positions etc. so that the machine automatically comes to the start position for testing when the file is opened.
- ✚ To create customized reports that can be linked with test methods and used to export test results
- ✚ To import ASCII data from NPL UK into the test software as a means of verification
- ✚ The software must have three levels of user access based on user login name and password protection.
- ✚ The software shall allow a user to configure a specific transducer (such as load cell or extensometer) and link it with a specific method such that the method will require that the specific transducer is used. If a different transducer is connected when a test is run with that method, the test will not run.

- ✚ It should be possible to export the raw data and the test data channels by a single mouse click into Excel or Word etc.
- ✚ The software must have the safety inspection square concept, which will help in fast and secure set up by description of the set test. Operator-independent security through the position-controlled system with the continuous backup of the current crosshead position in electronics. This means that the operator, when conversion of tools no longer have to worry about the settings!
- ✚ Preferably, testing software should have an “Education Module” to teach the students various testing configurations, virtually.

### **Computer and peripherals:-**

- ✚ A standard PC from the local market should be provided.
- ✚ There should be neither need for any special cards to be used with the pc nor the need to send the pc to the factory for adaptation etc.

### **Explicit Need:**

- ✚ Compliance to ASTM E8 Methods A&B and ISO 6892-1 Method A Strain control in closed loop with extensometer.
- ✚ The machine should perform tests in accordance to the above requirements in addition to the normal standards and the strain rate should be displayed.

### **Installation, commissioning and training:**

- ✚ Complete installation of machine to be completed by supplier. Also, actual testing on real sample should be shown after installation to ensure that all the modules of the testing facility are working properly as per the specifications.
- ✚ A two day intensive training (hand on training) of the testing facility showing the various module in working condition should be provided to few students.

### **Warranty and support:**

- ✚ 3 year onsite warranty should be provided after installation and commissioning of the testing facility.
- ✚ Technical support personnel should visit the testing facility to attend any break down or malfunction of the testing facility during the warranty period.
- ✚ Manufacturer should be in a position to supply the compatible accessories on demand for the next 10 years after the installation of the testing.

### TERMS & CONDITIONS for Rupee quote

1.	Sales tax	IIT will issue concessional sales Tax certificate for purchase of scientific and research items.  IIT is not eligible to issue "C" or "D" form.  Percentage of tax if applicable- may be mentioned.
2.	Validity	Should be mentioned clearly
3.	Service charges	Extra, if applicable
4.	Freight charges	Extra, if applicable
5.	Customs duty	IIT is eligible for concessional customs duty. The necessary certificate will be issued for clearance.
6.	Excise duty	IIT is fully exempted from excise duty. The necessary certificate will be issued for clearance.
7.	Discount	Should be stated in clear terms / percentage of discount should be stated.
8.	Warranty	May be stated clearly.
9.	Payment terms	- do -
10.	Delivery period	- do -
11.	AMC	May be stated clearly.
12.	Any other details	Separate sheet may be attached.

### TERMS & CONDITIONS for Foreign quote

1.	Price	Please state whether the price quoted by you is Ex-works / FOB / CIF / CIP / FCA etc.  For quote received in Ex-works / FOB / FCA etc. value, for freight, insurance etc. additional 10% of quote value will be added and comparison will be made accordingly for CIF / CIP at the prevailing exchange rate on the date of opening of tender (i.e.) on 18.03.2013
2.	Validity	Should be mentioned clearly
3.	Customs duty	IIT is eligible for concessional customs duty. The necessary certificate will be issued for clearance.
4.	Discount	Should be stated in clear terms / percentage of discount should be stated.
5.	Warranty	May be stated clearly.
6.	Payment terms	- do -
7.	Delivery period	- do -
8.	AMC	May be stated clearly.
9.	Any other details	Separate sheet may be attached.