



# Indian Institute of Technology Kanpur

## Advanced Center for Materials Science

**Enq. No.: ACMS/ AU/ 2012-13/ E-1**

**Enquiry Dated: March 02, 2013**

**Closing Date: March 18<sup>th</sup>, 2013**

ACMS requires the quotation for **Mechanical Testing system** (A. Tension test; B. Fatigue Test; C. Creep Test; desirables = hardness tester, instrumented Charpy impact tester, DIC, EDM, diamond wire-saw cutter). This facility should provide a complete mechanical characterization facility spanning from monotonic to cyclic loading, different modes of loading, very low to very high strain rate and temperature. The specifications for the equipment are in the addendum. The closing date for the above item is **March 18<sup>th</sup>, 2013**.

The prospective suppliers are required to send quotation in two parts in sealed envelopes, as "Technical Bid" and "Financial Bid". The Technical Bid should contain detailed technical specification of the product being offered and should not mention any prices. The Financial Bid should include the detailed price quotation clearly including the cost of the equipment, taxes, service charges if any, shipping and handling charges. The two separate and sealed envelopes should be clearly marked appropriately as "Technical Bid" and "Financial Bid".

### Terms and Conditions:

1. Maximum education discount, if any should be offered
2. Validity of quotation should be at least for 60 days
3. Prices should be on CIF and FOB separately (if imported)
4. Prices should include the installation and training cost
5. Warranty should be for at least three years after installation
6. Normal payment terms for the Institute will be applicable (90% on delivery of the items and the remaining 10% after satisfactory installation/ inspection)
7. Quotation should carry proper certifications like agency certificate, proprietary certificate, etc.
8. An undertaking that the vendor will supply all the spares and services for the equipment for at least 5 years from the date of commissioning
9. Delivery must be within 6 months (updated March 7<sup>th</sup>, 2013)

Kindly send the Technical and Financial bids in sealed envelopes latest by 18<sup>th</sup> March 2013 to:

**Dr. Anish Upadhyaya**  
**Head, Advanced Center for Materials Sciences**  
**IIT Kanpur, U.P. 208016, India.**  
**e-mail: anishu@iitk.ac.in**

## Technical Specifications for Mechanical Testing facility

Sr. No.	Parameter	Required specification*
<u>(a) Specifications of Universal Testing Machine (UTM) for tension, compression and torsion</u>		
1.	Load and strain rate	<ul style="list-style-type: none"> <li>• Load 100 kN and 500 Nm torsion</li> <li>• Strain rate: 0.0001 to 10 per second</li> <li>• High stiffness</li> <li>• ability to carry out constant true strain rate test</li> <li>• ability to carry out free and fixed end torsion experiments</li> </ul>
2.	Possible tests	<ul style="list-style-type: none"> <li>• Tension</li> <li>• Compression</li> <li>• Torsion (free and fixed end torsion)</li> </ul>
3.	Grips and fixtures	<ul style="list-style-type: none"> <li>• Mechanical and hydraulic grips to handle cylindrical and flat specimens</li> <li>• Compression platens</li> <li>• Torsion grips and actuator</li> </ul>
4.	Calibration	Load cell calibration unit
5.	PC Computer	<ul style="list-style-type: none"> <li>• Ethernet or USB interface</li> <li>• controlled by PC</li> <li>• Computer systems should be provided to meet special application requirements</li> <li>• Application software</li> <li>• On-line data capture and display at high strain rates</li> </ul>
6.	Strain measurement system	<ul style="list-style-type: none"> <li>• Follow ASTM standard</li> <li>• Minimum lateral motion</li> <li>• Maximum speed and accuracy</li> <li>• Excellent position resolution and accuracy</li> <li>• Additional Extensometers</li> <li>• Additional ports for external strain gauges</li> </ul>
7.	Load measurement system	<ul style="list-style-type: none"> <li>• Follow ASTM standard</li> <li>• Minimum lateral motion</li> <li>• Maximum speed accuracy</li> <li>• Excellent position resolution and accuracy</li> </ul>
8.	High Temperature Furnace	Work up to 1000°C
9.	Installation & User Training	Included in the quotation
10.	Safety	Automatic Stop or Return following sample break
11.	Digital Image Co-relation (optional)	Suitable software and hardware
<u>(b) Specifications of Universal Testing Machine (UTM) for bending, fracture and (low and high cycle) fatigue</u>		

## Technical Specifications for Mechanical Testing facility

12.	Load and strain rate	<ul style="list-style-type: none"> <li>• Load upto 100 kN</li> <li>• Strain rate: 0.001 to 0.1 per second</li> <li>• High stiffness</li> <li>• minimum 0-100 Hz operation</li> <li>• Ability to provide good control in LCF and HCF regime</li> <li>• Additional load cells of 5 and 10 kN</li> </ul>
13.	Possible tests	<ul style="list-style-type: none"> <li>• Fatigue (low cycle and high cycle)</li> <li>• Fatigue crack propagation</li> <li>• Fracture</li> <li>• Bending</li> </ul>
14.	Grips and fixtures	<ul style="list-style-type: none"> <li>• Mechanical and hydraulic low cycle grips to handle cylindrical and flat specimens</li> <li>• 3 point bend fixture (4 point bend is optional)</li> <li>• Clevis grips for fracture mechanics</li> </ul>
15.	Calibration	Load cell calibration unit
16.	PC Computer	<ul style="list-style-type: none"> <li>• Ethernet or USB interface</li> <li>• controlled by PC</li> <li>• Computer systems should be provided to meet special application requirements</li> <li>• Application software for LCF, HCF</li> <li>• Automatic control of load and strain rate and cross head speed</li> <li>• Capable of performing repetitive cycling for position, strain or load</li> <li>• On-line data capture and display at high frequency</li> </ul>
17.	Strain measurement system	<ul style="list-style-type: none"> <li>• Follow ASTM standards for tension, compression and fracture mechanics application</li> <li>• Highest accuracy, repeatability and resolution</li> <li>• Additional ports for external strain gauges</li> <li>• Travelling microscope to measure crack growth (optional)</li> <li>• CTOD facility following ASTM standard</li> </ul>
18.	Load measurement system	<ul style="list-style-type: none"> <li>• Follow ASTM standard E4</li> <li>• Minimum lateral motion</li> <li>• Maximum speed and accuracy</li> <li>• Excellent position resolution and accuracy</li> </ul>
19.	Environmental chamber	To control temperature and humidity
20.	Installation & User	Included in the quotation
21.	Safety	Automatic Stop or Return following sample break

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22.	Sample preparation (optional)	<ul style="list-style-type: none"> <li>• Electro Discharge Machining</li> <li>• Diamond wire saw cutter</li> </ul>
<u>(c) Specifications of constant stress Creep Testing Machine (optional)</u>		
23.	General specifications	<ul style="list-style-type: none"> <li>• Multi station creep facility</li> <li>• Load 15 kN</li> <li>• Temp. 1600 °C (desired)</li> <li>• Suitable software package</li> <li>• Suitable PC for data acquisition and analysis</li> </ul>
<u>(d) Specifications of Instrumented Charpy impact tester (optional)</u>		
24.	General specifications	<ul style="list-style-type: none"> <li>• Strain gauge amplifier</li> <li>• Instrumented striker with cable</li> <li>• Suitable software package</li> <li>• Suitable data card</li> <li>• Suitable PC for data acquisition and analysis</li> </ul>
<u>(e) Specifications of Universal Hardness tester (optional)</u>		
25.	General specifications	<ul style="list-style-type: none"> <li>• Brinell, Vickers, Knoop, Rockwell</li> <li>• Wide load range</li> <li>• Automatic hardness evaluation</li> <li>• Easy clamping</li> </ul>
26.	Annual Maintenance Cost	Include the cost of annual maintenance for each year for five years after the guarantee/ warranty period. Provide the amount and the terms, Note that those providing better after sales service and support with written evidence will be given preference
<p><b>*Additional optional accessories should be indicated separately along with their price. The above specs are desirable and the actual numbers achievable for your system should be indicated.</b></p>		