

**TENDER INVITATION  
FOR  
SUPPLY, COMMISSIONING, AND TRAINING  
OF**

**A 6-COMPONENT PIEZOELECTRIC DYNAMOMETER FOR FORCE MEASUREMENT**

Sealed tender offers are invited in two separate sealed covers (Technical and Commercial offers) from eligible manufacturers/suppliers or their direct Indian agents for the supply of the following equipment.

**6-component piezoelectric dynamometer for force measurement**

Please send offers, **ALONG WITH DESCRIPTIVE CATALOGUE/ BROCHURE**. The validity of the bid should be at least five months (150 days) or more from the date of the opening of this tender. Please ensure that your quotation reaches not later than **06/11/2018 (Tuesday) by 10:00 Hrs (Indian time)** at the following address:

**Professor-in-Charge,  
DHI Centre of Excellence on Advanced Manufacturing  
Technology, (Inside Steel Technology Centre),  
Indian Institute of Technology Kharagpur,  
721 302, West Bengal, India**

Earnest money of **Rs. 70,000** is to be deposited in the form of Account Payee Demand Draft in favour of IIT Kharagpur, payable at Kharagpur, India. **Any bid which is not accompanied with an EMD, and Tender fee shall be summarily rejected.** Earnest money deposited will be forfeited if the tenderer withdraws or amends its tender or impairs or derogates from the tender in any respect within the period of validity of its tender. No interest will be paid on the earnest money of the unsuccessful bidders.

Tender Reference	<b>IIT/SRIC/CoE_AMT/DHI/2018/EQ33, dated 15/10/2018</b>
Tender Fee	<b>Rs 5000/-</b>
Last Date and Time for submitting the tender document	<b>06.11.2018 (Tuesday) at 10:00 Hrs (Indian time)</b>
Time and Date of Opening of Technical Bids	<b>06.11.2018 (Tuesday) at 11:00 Hrs (Indian time)</b>
Place of Opening Tender	Office of Professor-in-Charge, DHI Centre of Excellence on Advanced Manufacturing Technology, <i>(Inside Steel Technology Centre),</i> Indian Institute of Technology Kharagpur, 721 302, West Bengal, India
Address of Communication	<b>As stated above</b>
Contact Telephone Numbers	<b>+91- 3222 - 281576</b>
E-mail	<a href="mailto:coeamt@iitkgp.ac.in"><b>coeamt@iitkgp.ac.in</b></a>

## General information about the requirement

*The required instrument (6-component piezoelectric dynamometer) will be used to measure the forces and torques in three orthogonal directions (x, y, and z). The measurement of forces and torques during a solid state welding process such as friction stir welding (FSW) will be the major area of application. In FSW, a tool continuously exerts pressure on the jobs fixed on the machine bed, and simultaneously the machine bed traverses. The dynamometer will be mounted on the machine bed. The dynamometer hence must be rigid enough and must possess a high natural frequency.*

## Detailed technical specifications

<b>A. Sensor</b>		
Type	6-component piezoelectric dynamometer for force measurement	
Range of measurements	F <sub>x</sub>	± 20 kN or more
	F <sub>y</sub>	
	F <sub>z</sub> (vertical direction)	-10 to 40 kN or more
Mounting plate dimensions	250 mm x 250 mm or more	
Calibrated partial range	F <sub>x</sub>	0 to 2 or better
	F <sub>y</sub>	
	F <sub>z</sub>	0 to 4 or better
Overload	F <sub>x</sub>	± 24 kN
	F <sub>y</sub>	
	F <sub>z</sub>	-12 to 48 kN
Natural frequency (x,y, and z directions)	3 kHz or better	
Natural frequency (x and y directions), (mounted on flanges)	1.7 kHz or better	
Natural frequency (z direction), (mounted on flanges)	2 kHz or better	
Operating temperature range	0 to 70 °C or better	
Temperature coefficient of sensitivity	- 0.02 %/°C or better	
Insulation resistance	10 <sup>13</sup> Ω or better	

Ground insulation	10 <sup>8</sup> Ω or better
Insulation class	IP 67
Cable for connecting the dynamometer to the charge amplifier for measurements ( <i>Optional</i> )	
<b><i>B. Training</i></b>	
Training shall be provided to IIT- Kharagpur doctoral scholars by the supplier at IIT Kharagpur. The training should cover complete operation, and usage of the instrument in all aspects of measurement, preventive maintenance, and trouble shooting.	
<b><i>C. Warranty</i></b>	
The product shall have a comprehensive warranty (parts, labour and visit by the service engineers) for a minimum period of 3 years after commissioning for defect-free operation and specified accuracies at IIT- Kharagpur.	
Any defect observed during the warranty period shall be replaced/repared free of cost with minimum down time.	
<b><i>D. Non-comprehensive warranty</i></b> (optional)	
The supplier may undertake a non-comprehensive AMC for a period of three years, after the expiry of comprehensive warranty of three years. The quote shall be in Indian Rupees since it is envisaged that non-comprehensive AMC is to be carried out by the authorized service provider of the manufacturer.	

**Note:**

The connecting cable has been marked optional in the provided specifications. However, the supplier must include this item in their quote with a separate price indication.

**GENERAL TERMS & CONDITIONS**

PLEASE SPECIFICALLY INDICATE THE FOLLOWING POINTS IN YOUR QUOTATIONS AND COMPLY THE TERMS AS MENTIONED HERE UNDER: -

1. TENDER ARE INVITED COMPLYING THE REQUIREMENT FOR TENDER AS DETAILED IN THE TENDER SPECIFICATION TO BE SUBMITTED IN THE COMPANY'S / FIRM'S LETTERHEAD NEATLY PRINTED / TYPED DULY SIGNED BY AUTHORIZED PERSON WITH THE SEAL OF THE BIDDERS. ALL ENVELOPES CONTAINING THE TENDER SHOULD BE PROPERLY SEALED. SEPARATE ENVELOPES SHOULD BE USED FOR TECHNICAL AND PRICE BID AND INDICATION TO THEIR EFFECT MAY PLEASE BE SUPERSCRIBED ON THE ENVELOPE.

**THE FOLLOWING DOCUMENTS ARE REQUIRED FROM THE INDIAN AGENTS OF FOREIGN FIRMS:**

- 1.1 FOREIGN PRINCIPAL'S PROFORMA INVOICE INDICATING THE COMMISSION PAYABLE TO THE INDIAN AGENT AND NATURE OF AFTER SALES SERVICE TO BE RENDERED BY THE

INDIAN AGENT.

1.2 COPY OF THE AGENCY AGREEMENT WITH THE FOREIGN PRINCIPAL INDICATING THE NATURE OF AFTER SALES SERVICES, PRECISE RELATIONSHIP BETWEEN THEM AND THEIR MUTUAL INTEREST IN THE BUSINESS.

2. TECHNICAL CATALOGUE/LEAFLET SHOULD BE ENCLOSED WITHOUT FAIL. PROVIDE COMPLIANCE STATEMENT WITH RESPECT TO THE TECHNICAL SPECIFICATIONS MENTIONED ABOVE.
3. PLEASE CONFIRM WHETHER YOU ARE AUTHORIZED TO QUOTE ON BEHALF OF YOUR PRINCIPALS AND IF SO, PLEASE ENCLOSE A COPY OF SUCH AUTHORISATION WITH YOUR QUOTATION.
4. **PRICE BIDS FOR FOREIGN FIRMS:** PRICES ARE TO BE QUOTED ON 'EX-WORKS' DULY PACKED OR ON "FCA/FOB" INTERNATIONAL PORT" BASIS AND ALSO INCLUDING AGENCY COMMISSION PAYABLE TO YOUR INDIAN AGENTS, IF ANY SHOWING CLEARLY THE FOLLOWING BREAK UP:-
  - I) EX-WORKS PRICE
  - II) PACKING & FORWARDING
  - III) FREIGHT
  - IV) ANY OTHER RELEVANT EXPENSES.
  - V) TAXES PAYABLE BY THE INSTITUTE

INSURANCE WILL BE PAID BY OUR INSTITUTE SEPARATELY AND SHOULD NOT FORM PART OF THE QUOTED PRICE.

**PRICE BIDS FOR INDIAN FIRMS:** PRICES ARE TO BE QUOTED ON F.O.R., IIT KHARAGPUR, ON DOOR DELIVERY BASIS CLEARLY SHOWING THE BREAK UP.

5. **PERIOD OF VALIDITY:** BIDS SHALL REMAIN VALID FOR ACCEPTANCE FOR A PERIOD OF 150 DAYS FROM THE DATE OF OPENING.
6. INDIAN AGENTS ADDRESS AND PERCENTAGE OF AGENCY COMMISSION INCLUDED IN ABOVE F.O.B./EX-WORKS PRICE. (THIS WILL BE PAID TO THE INDIAN AGENTS IN INDIAN RUPEES ONLY AND NOT IN **FE**). PLEASE ENCLOSE COPY OF AGENCY AGREEMENT ENTERED INTO  
WITH YOUR PRINCIPALS INDICATING THE NATURE OF AFTER SALES SERVICES OF INDIAN AGENTS, PRECISE RELATIONSHIP & MUTUAL INTEREST IN THE BUSINESS.
7. **MEASUREMENTS/WEIGHT:** NETT/GROSS OF THE CONSIGNMENT. IN CASE OF AN ORDER, YOU SHALL USE AIR WORTHY PACKAGE (AS APPLICABLE) DULY CERTIFIED WITH DOCUMENTS – PLYTO – SANITARY CERTIFICATE (AS PER QUARANTINE ORDER 2003).
8. **SCOPE OF SUPPLY:** SHOULD INCLUDE FREE INSTALLATION AND COMMISSIONING
9. **PAYMENT TERMS FOR FOREIGN FIRMS**

THE OFFER WILL BE MADE ON A SINGLE CURRENCY AND ONLY ONE PO WILL BE ISSUED FOR THE ENTIRE SCOPE OF THE SUPPLY.

- A) 90% PAYMENT THROUGH SIGHTDRAFT/FOREIGN DEMAND DRAFT/LC (EXCEPTIONAL CASES)/SWIFT TELE TRANSFER AFTER RECEIPT OF STORE IN GOOD ORDER AND CONDITION AND 10% AFTER SUCCESSFUL INSTALLATION & COMMISSIONING.
- B) BANK CHARGES ON LC/SD (WITHIN INDIA APPLICANT ACCOUNT AND OUTSIDE INDIA TO BENEFICIARY ACCOUNT).

**PAYMENT TERMS FOR INDIAN FIRMS**

- A) 100% PAYMENT THROUGH CROSSED ACCOUNT PAYEE CHEQUE / ELECTRONIC TRANSFER AFTER RECEIPT OF STORE IN GOOD ORDER & CONDITION AND SUCCESSFUL INSTALLATION & COMMISSIONING.
  - B) ENSURE MENTIONING
    - i) BANK DETAILS OF THE BENEFICIARY, GST NO. AND PAN NUMBER
    - ii) FULL NAME AND ADDRESS OF THE BENEFICIARY ON WHOM ORDER HAS TO BE PLACED
10. WHETHER ANY EXPORT LICENCE IS REQUIRED FROM YOUR GOVERNMENT, IF SO, PLEASE CONFIRM WITH DETAILS.
  11. COUNTRY OF ORIGIN OF THE GOODS IS TO BE MENTIONED.
  12. THE INSTITUTE SHALL PROVIDE THE CONCESSIONAL CUSTOMS DUTY AND EXCISE DUTY EXEMPTION CERTIFICATE AS PER GOVT. NOTIFICATION NO. 51/96 CUSTOMS DATED: 23.07.1996 AND CENTRAL EXCISE DUTY EXCEMPTION IN TERMS OF GOVT. NOTOFICATION NO. 10/97 – CENTRAL EXCISE DATED: 01.03.1997 AS AMENDED FROM TIME TO TIME.
  13. **LIQUIDATED DAMAGES:** THE STORES SHOULD BE DELIVERED / DISPATCHED TO DESTINATION AND READY FOR OPERATION NOT LATER THAN THE DELIVERY DATE SPECIFIED. IT THE SUPPLIER FAILS TO DELIVER ANY OR ALL THE STORES OR PERFORM THE SERVICE BY THE SPECIFIED DATE, LIQUIDATED DAMAGES AT 1% PER MONTH OR PART THEREOF IN RESPECT OF THE VALUE OF STORES WILL BE DEDUCTED FROM THE CONTRACT PRICE SUBJECT TO A MAXIMUM OF 5%. ALTERNATIVELY, THE ORDER WILL BE CANCELLED AND THE UNDELIVERED STORES PURCHASED FROM ELSEWHERE AT THE RISK AND EXPENSE OF SUPPLIER.
  14. **PATENT RIGHTS:** THE SUPPLIER SHALL INDEMNIFY THE PURCHASE AGAINST ALL THIRD PARTY CLAIMS OF INFRINGEMENT OF PATENT, TRADEMARK OR INDUSTRIAL DESIGN RIGHTS ARISING FROM USE OF THE GOODS OR ANY PART THEREOF IN INDIA.
  15. ONLY THOSE BIDDERS WHO’S BIDS HAVE BEEN TECHNICALLY FOUND ACCEPTABLE WILL ONLY BE INVITED FOR PARTICIPATION IN THE PRICE BID.
  16. THOSE BIDDERS WHO DO NOT RECEIVE ANY COMMUNICATION FOR PARTICIPATION IN PRICE BID OPENING MEETING MAY PRESUME THAT THEIR BID HAS NOT BEEN ACCEPTED BY THE INSTITUTE.
  17. CONDITIONAL OFFER WILL NOT BE ACCEPTED.
  18. LATE TENDERS i.e. TENDER RECEIVED AFTER THE DUE DATE AND TIME OF SUBMISSION AS MENTIONED ABOVE SHALL NOT BE ACCEPTED.

19. BIDDERS TO ENCLOSE THE FOLLOWING DOCUMENTS:-

- A) INCOME TAX RETURN (3 YRS) AND LATEST SALES TAX RETURN (GST No.), AND PAN NO.
- B) BANKER’S SOLVENCY CERTIFICATE
- C) SUMMARY OF AUDITED STATEMENT OF ACCOUNTS FOR THE LAST THREE YEARS TO BE ENCLOSED AND FINANCIAL HIGHLIGHTS AND THE KEY PERFORMANCE DURING THE LAST THREE QUARTERS TO BE ENCLOSED AS PER FORMAT:-

COMPANY’S KEY PERFORMANCE

DESCRIPTION	JAN. TO MARCH	APRIL TO JUNE	JULY TO SEPT.
GROSS REVENUE			
PROFIT BEFORE TAX			
PROFIT AFTER TAX			
RETURN ON INVESTED			
CAPITAL (ROIC)			

D) CUSTOMER SATISFACTION CERTIFICATE FROM ONE SUCH ORGANIZATION IS TO BE ATTACHED WITH THE TECHNICAL BID AND PRICE BID.

E) NAME AND ADDRESS OF MINIMUM THREE CLIENTS TO WHOM SUCH EQUIPMENT HAVE BEEN SUPPLIED SHOULD BE MENTIONED.

20. THE INSTITUTE DOES NOT BIND ITSELF TO OFFER ANY EXPLANATION TO THOSE BIDDERS WHO’S TECHNICAL BID HAS NOT BEEN FOUND ACCEPTABLE BY THE EVALUATION COMMITTEE OF THE INSTITUTE.

21. ALL TENDERS (UNLESS OTHERWISE SPECIFIED) ARE TO BE SUBMITTED / HANDED OVER TO

**OFFICE OF PROFESSOR-IN-CHARGE,  
DHI CENTRE OF EXCELLENCE ON ADVANCED MANUFACTURING  
TECHNOLOGY, (INSIDE STEEL TECHNOLOGY CENTRE),  
INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR, 721 302, WEST BENGAL, INDIA**

AND ACKNOWLEDGEMENT TO BE OBTAINED.

**IMPORTANT**

- 1. IIT Kharagpur authority may accept or reject any or all the bids in part or in full without assigning any reason and does not bind itself to accept the lowest bid. The Institute at its discretion may change the quantity/ upgrade the criteria/ drop any item or part thereof at any time before placing the Purchase Order.
- 2. Promptly make arrangements for repair and/ or replacement of any damaged item (s) irrespective of settlement of claim.
- 3. In case of any dispute, the decision of the Institute authority shall be final and binding on the bidders.
- 4. For any query pertaining to this bid document correspondence may be addressed to

**Professor-in-Charge,  
DHI Centre of Excellence on Advanced Manufacturing Technology,  
(Inside Steel Technology Centre),  
Indian Institute of Technology Kharagpur 721 302,  
West Bengal, India  
E-mail: [coeamt@iitkgp.ac.in](mailto:coeamt@iitkgp.ac.in)**

**LAST DATE FOR SUBMISSION OF SEALED BIDS: 06.11.2018 at 10:00 Hrs (Indian time)**

- 1) Please Note that the Institute remains closed during Saturdays & Sundays and all specified government holidays.
- 2) Fax, e-mail Tender will not be accepted.
- 3) The General Terms and Conditions as stated above relate to supply of stores/ equipment/ assets etc. and for specific service other terms and conditions of the Institute will apply.