अमृतं तु विद्या
Bharatiya Vidya Bhavan's
Sardar Patel College of Engineering
(Government-Aided Autonomous Institute)
MUNSHI NAGAR, ANDHERI (WEST), MUMBAI - 400 058.
Tel : 91-22-2623 2192
91-22-2628 9777
Fax : 91-22-2623 7819
E-mail : principal@spce.ac.in
Web : www.spce.ac.in

INVITATION LETTER

Package Code: TEQIP-III/MH/bspc/35
Package Name: Equipment for Machine Design labsetup and workshop upgradation

Current Date: 14-May-2019
Method: Shopping Goods

To,

Sub: INVITATION LETTER FOR Equipment for Machine Design labsetup and workshop upgradation

Dear Sir,

1. You are invited to submit your most competitive quotation for the following goods with item wise detailed specifications given at Annexure I,

Sr. No	Item Name	Quantity	Place of Delivery	Installation Requirement (if any)
1	Equipment for Machine Design labsetup and workshop upgradation	1	Sardar Patel Collage Of Engineering	Yes

2. Government of India has received a credit from the International Development Association (IDA) towards the cost of the **Technical Education Quality Improvement Programme [TEQIP]-Phase III** Project and intends to apply part of the proceeds of this credit to eligible payments under the contract for which this invitation for quotations is issued.

3. **Quotation**

3.1 The contract shall be for the full quantity as described above.

3.2 Corrections, if any, shall be made by crossing out, initialling, dating and re writing.

3.3 All duties and other levies payable by the supplier under the contract shall be included in the unit Price.

3.4 Applicable taxes shall be quoted separately for all items.

3.5 The prices quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.

3.6 The Prices should be quoted in Indian Rupees only.

4. Each bidder shall submit only one quotation.

5. Quotation shall remain valid for a period not less than **30**days after the **last** date of quotation submission.

6. Evaluation of Quotations: The Purchaser will evaluate and compare the quotations determined to be Substantially responsive i.e. which

6.1 are properly signed; and

6.2 Confirm to the terms and conditions, and specifications.

7. The Quotations would be evaluated for all items together.

8. Award of contract The Purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.

8.1 Notwithstanding the above, the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of Contract.

8.2 The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiration of the quotation validity period. The terms of the accepted offer shall be Incorporated in the purchase order.

9. Payment shall be made in Indian Rupees as follows:

Satisfactory Delivery & Installation - 10% of total cost
Satisfactory Acceptance - 90% of total cost

10. Liquidated Damages will be applied as per the below:
Liquidated Damages Per Day Min % : N/A
Liquidated Damages Max % : N/A

11. All supplied items are under warranty of **60** months from the date of successful acceptance of items and AMC/Others is **1.0 Year.**

12. You are requested to provide your offer latest by **05:30** hours on **27-May-2019.**

13. Detailed specifications of the items are at Annexure I.

14. Training Clause (if any) **Yes**

15. Testing/Installation Clause (if any) **Yes**

16. Performance Security shall be applicable: **0%**

17. Information brochures/ Product catalogue, if any must be accompanied with the quotation clearly indicating the model quoted for.

18. Sealed quotation to be submitted/ delivered at the address mentioned below, **BVB Sardar Patel College of Engineering J P Nagar, Munshi NagarAndheri (West)MUMBAI,Bhavan's Campus, Munshi Nagar, Andheri (W), Mumbai 400058**

19. We look forward to receiving your quotation and thank you for your interest in this project.

(Authorized Signatory)
Name & Designation

TEQIP III Co-ordinator
BVB'S Sardar Patel College of Engineering
Mumbai - 400 058.

Procurement Coordinator TEQIP III
Sardar Patel College
Munshi Nagar, V
Andheri (West), Mumbai - 400 058

Annexure I

Sr. No	Item Name	Specifications
1	Equipment for Machine Design labsetup and workshop upgradation	**Technical Specification:** This specification is for design, supply, installation, commissioning and demonstration of the dynamic servo-hydraulic UTM for evaluating tensile, compression, fatigue and fracture properties. The system should preferably run on single phase 220V uninterrupted power supply without the need for site preparation. This equipment is proposed to be used to evaluate above-mentioned properties on various materials like aluminium alloys, steels, titanium alloys at ambient temperature. Tests like tension, compression and fatigue will be conducted to evaluate material properties and to assess the material behavior. **Proof of technical competency with preferably three similar equipment supplied, installed, maintained, which are currently working elsewhere, is highly desirable.** **DETAILED TECHNICAL SPECIFICATIONS OF THE 25kN DYNAMIC SERVO HYDRAULIC UNIVERSAL TESTING MACHINE** **A. Load Frame** A.1. Frame rated for at least 25kN in tension / Compression. A.2. Minimum stiffness better than 50kN/mm, precision aligned load frame with fixed lower platen and adjustable upper crosshead. A.3. The column clearance is 400mm and the maximum vertical daylight is 700mm. A.4. Load frame should preferably sit on an enclosure that houses pump and digital controls. A.5. It should preferably have castors for easy re-location of system A.6. System should be rated for indefinite operations **B. Fatigue rated actuator assembly** B.1. Linear dynamic/static capacity: ±25kN B.2. Minimum Stroke length: ± 25mm with resolution of 0.1μm B.3. Shall include anti-rotation assembly B.4. Servo valves of suitable rating and accumulators of suitable capacity. **C. Hydraulic power pack** C.1. Hydraulic power pack of sufficient capacity to run the system continuously has to be provided. C.2. Proper size of accumulators has to be incorporated to avoid jerks/pressure transients in the event of power failure.

C.3. All safety provisions, pressure indicators, temperature indicators, relays have to be incorporated.
C.4. Hydraulic oil of sufficient quantity for the first time filling for the use of hydraulic power pack has to be provided.
C.5. Maximum working noise should be 65 dB
C.6. Power pack shall be compact (an integrated power pack is preferable).
C.7. System should be self-cooled.
C.8. It should run on single phase 220V uninterrupted power supply.
C.9. The system should not require site preparation

D. Digital Servo Controller including/ensuring

D.1. 1 channel of digital encoder input
D.2. Up to 8 channels of conditioned analog inputs with suitable signal conditioners
D.2.1. One channel of load cell input
D.2.2. One channel of strain-bridge extensometer / crack-opening displacement gage input
D.2.3. Six Spare Channels
D.3. One channel of digital servo-control with loop update frequency of at least 5 kHz
D.4. Eight digital I/O / Logic drive and sense lines.
D.5. Synchronized data acquisition into host computer at 5 kHz from up to:
D.5.1. One channels of 32-bit digital encoder readouts
D.5.2. Eight channels of 24-bit analog feedback readouts
D.5.3. One channel of Set Point
D.5.4. One channel servo-output for monitoring purposes
D.6. 8-bits of digital I/O status for time tagged device sense and control at 1kHz data acquisition rate
D.7. User settable software safety limit interlocks on upper and lower limit readout on each of 2+8 feedback channels with individual option of Stop/Hold/Trip
D.8. Servo control of actuator with user settable/programmable:
D.9. Mode control (Load, Stroke, Strain)
D.10. Real-time automatic adaptive servo-gain adjustment to account for system stiffness variation as a function of specimen stiffness
D.11. Static ramping of Load / displacement/ strain with independently settable ramp rate.
D.12. Cyclic loading with ramp/sine waveform and user settable mean, amplitude and phase at frequency of up to 50 Hz and restricted as per the actuator performance curve, with better than 2% accuracy in loading through adaptive control.
D.13. Provision for multi-step static and cyclic loading, with provision to switch control mode(s) as required.
D.14. User settable error limit on servo-control with option of Stop/Trip
D.15. Host computer with Windows 7 or higher version of operating system and suitable application software for ease of

performing tests under specified conditions with provision for report generation by way of multiple worksheet XL-tables including raw data arranged suitably as columns for individual channels.

D.16. Additional, easy to use Tablet/Smartphone with WiFi interface to host computer to permit easy stroke positioning by operator during specimen mount/dismount through local access to readouts and device control/status. Tablet mounting with power supply to be provided at convenient location.

D.17. One Hardwired E-Stop located on the frame for easy access.

D.18. UPS to guarantee safe shut down and unloading in the event of power failure

E. Grips and Accessories for Room Temperature Applications

E.1. **Universal Grips:**

+/-25kN Manually Operated Grips

F. LCF Test Package

F.1. **Threaded Cups**

A set of customized cups that directly integrate with the Universal Grip pull rod to test round specimens with threaded ends of size M8, M10 and M12.

F.2. **Axial Extensometer for LCF Applications**

Gage length: 12.5 mm

Measuring range: 0.5/-0.5 mm

Accuracy: ± 0.5% of read out value as per ASTM E83

Excitation: 5 to 10 VDC

Sensitivity: 2 to 4 mv/V

Full bridge, 350 ohms strain gauged design

These extensometers shall work in both tension and compression, and should be designed so as to make them very rugged and insensitive to vibrations, which permits higher frequency operation. These shall be supplied with standard quick attach kit, for easy mounting on the specimen. Mechanical over travel limits in both directions should be provided.

F.3. **Low Cycle Fatigue Testing Software (As per ASTM E606)**

The user interface contains specimen description, loading parameters, pump controls, test run/stop, graph display, numeric readouts of multiple relevant test parameters. Tests can be done in stroke or strain control. Tests can be done in stress control, total strain control and plastic strain control. Online display of loading modulus, unloading modulus, K', n' yield stress, plastic strain, max-min stress and strain.

Limit settings on stroke and strain

Auto data acquisition settings.

Online graphs of stress vs strain and transients.

Offline post processing program to analyze the results in MS Excel.

Option to save the test profiles.
Option to remove residual strain.
Option to add strain to gage length.
Option to terminate the test at specified modulus drop, stress drop and/or increase in strain.

G. Tensile, Compression and Flexure Test Package

G.1. **Wedge Grips**

A set of customized collets that directly integrate with the Universal Grip pull rods to test flat specimens from 0.5 mm to 5 mm in thick and 25 mm wide.

G.2. **Compression Platens**

A set of customized platens that directly integrate with the Universal Grip pull rods to test specimens that can be accommodated within the 60 mm diameter of the platen.

G.3. **Axial Extensometer for Tensile Test Applications**

Gauge length: 12.5 mm
Measuring range: +6.25/-3.1 mm
Accuracy: ± 0.5% of read out value as per ASTM E83
Excitation: 5 to 10 VDC
Sensitivity: 2 to 4 mv/V
Full bridge, 350 ohms strain gauged design

G.4. **Tensile and Compression Testing Software (As per ASTM E8 and ASTM E9)**

Software to perform Tensile and Compression test. The user interface contains specimen description, loading parameters, pump controls, test run/stop, graph display, numeric readouts of multiple relevant test parameters.
Tests can be done in stroke or strain control.
Online graphs of stress vs. strain and load vs. displacement.
Option to save the test profiles.
Auto data acquisition settings
Option to view multiple test graphs in one plot.
Option to run test in dual rate.
Option to remove the extensometer and continue the test in stroke control.
Option to stop the test after specified percentage load drop.
Limit settings on stroke, strain and load channels.
Offline post processing program to analyse the results in MS Excel.

H. Fracture Mechanics Test Package

H.1. **Clevis Grips**

A set of clevis grips that is directly integrated with the Universal Grip pull rods to test specimens with pin holes should be provided. These should be designed to accommodate C(T) specimens with a pin diameter and thickness of 6.35 mm and a width of 25.4 mm.

		H.2. **Three Point Bend Fixture** A set of customized fixtures that directly integrated with the Universal Grip pull rods to test specimens in flexure. It should accommodate specimens within the span range of 45 to 150 mm with roller pins of 10 mm. H.3. **COD gauge** Gauge length: 5 mm Measuring range: +3/-1 mm COD Gage for fracture mechanics studies, in compliance with ASTM E647 and E1820 High accuracy, full strain gauged bridge construction Accuracy ± 0.5% of readout value as per ASTM E 83 Sharp grooves as per ASTM E 83 for improved stability Excitation: 5 to 10 VDC Sensitivity: 2 to 4 mv/V Non linearity: 0.15% H.4. **Fracture Toughness Software for K_{Ic}, J_{Ic} and CTOD Testing (As per ASTM E1820 and E399)** The user interface should contain specimen description, loading parameters, pump controls, test run/stop, graph display, numeric readouts of multiple relevant test parameters. Tests can be done in stroke or COD control. Real time graphs of J vs. Δa and load vs. displacement. Option to save the test profiles. Auto data acquisition settings Auto scaling of graph. Option to see J and Δa value online. Option to select the previous data file and export the data. Data file storage in same settings file. Option to stop the test after specified percentage load drop. Offline post processing program to analyze the results in MS Excel H.5. **AC-08-0002 Fatigue Crack Growth Testing Software (As per ASTM E647)** Tests can be done in constant load control, K control, decreasing K control and combination of these with multiple steps. Option to program multiple steps with different loading conditions and different frequencies. Online graphs of da/dN, load vs. COD, crack length vs cycles, K vs cycles, etc. Online display of crack length, Kmax, Kmin, ΔK, Pmax, Pmin, ΔP, da/dN and more Option to stop the test at specified crack length, crack increment, Kmax, cycles etc. Option to do variable amplitude test using spectrum files like Twist and Falstaff.

		Option to save the test profiles. Auto data acquisition settings. Auto scaling of graphs. Option to enter material properties and specimen dimensions. Option to measure crack length using remote LLD gage. Offline post processing program to analyse the results in MS Excel. **I. Warranty and Support** Warranty and Support shall be for 5 years.\ '\ '4321q`
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FORMAT FOR QUOTATION SUBMISSION
(In letterhead of the supplier with seal)

Date: _____

To:_____
_____

Sl. No.	Description of goods \ (with full Specifications)	Qty.	Unit	Quoted Unit rate in Rs. (Including Ex-Factory price, excise duty, packing and forwarding, transportation, insurance, other local costs incidental to delivery and warranty/ guaranty commitments)	Total Price (A)	Sales tax and other taxes payable	
						In %	In figures (B)
Total Cost							

Gross Total Cost (A+B): Rs. _____

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. _____ (Amount in figures) (Rupees _____amount in words) within the period specified in the Invitation for Quotations.
We confirm that the normal commercial warranty/ guarantee of _____ months shall apply to the offered items and we also confirm to agree with terms and conditions as mentioned in the Invitation Letter.
We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

Signature of Supplier
Name: _____
Address: _____
Contact No. _____