

DELHI TECHNOLOGICAL UNIVERSITY

(FORMERLY DELHI COLLEGE OF ENGINEERING)

GOVERNMENT OF NATIONAL CAPITAL TERRITORY OF DELHI
SHAHBAD DAULATPUR: BAWANA ROAD: DELHI-110 042

Ph. 27296326

No. F. 211/02-01/11-12/S&P

Dated:

E-Tenders along with illustrated literature/leaflets for the supply/execution of item(s)/stores/work detailed below are invited in two-bids system through 'e' procurement solution only as per the guidelines and terms & conditions given in tender document - details of the NIT along with terms & conditions, specifications etc. can be seen/downloaded at/from the website.

The interested tenderers should upload duly signed tender form and their bids along with scanned copies of all the relevant certificates, documents etc. in support of their technical bids and price bids – all duly signed - on the: <https://govtprocurement.delhi.gov.in>. latest by **23/11/11. up to 2.00P.M** . An index prepared after pagination of all tender document and enclosures I document may also be uploaded. The technical bids will be opened online on **23/11/11 at 2.30 P.M** for only those bidders whose DDR/FDR for EMD amount is dropped in Tender Box placed in the office of Asst. Registrar (S&P) in the presence of the bidders who wish to be present and also displayed on the website and the financial bids of eligible firms shall be opened on **30/11/11**. For participation in the tender through e-procurement solution, the enterers are required to have digital certificate and get registered with application Service Provider NIC.

Tender document is also available for viewing on the website of Delhi Technological University, Delhi at www.dce.edu . and www.dce.ac.in

Yours faithfully,

A.R (S&P),

EMD: Rs. 25,000/-

| S. No | Particulars /Description | Reqd.Qty |
|-------|---|----------|
| 1 | Thermal Conductivity of Metal Rod Apparatus | 01 No |
| 2 | Thermal Conductivity of Liquid Apparatus | 01 No |
| 3 | Thermal Conductivity of Insulating Slab Apparatus | 01 No |
| 4 | Heat transfer in Natural Convection Apparatus | 01 No |
| 5 | Heat Transfer in Forced Convection Apparatus | 01 No |
| 6 | Condensation in Drop & Film Forms Apparatus | 01 No |
| 7 | E missivity Measurement Apparatus | 01 No |
| 8 | Stefan Boltzmann Apparatus | 01 No |
| 9 | Critical Heat Flux Apparatus : Concentric Tube Heat Exchanger | 01 No |

Specification details:-

| S.No | Particulars/ Description | Reqd Qty |
|------|--|----------|
| 1 | <p>Thermal Conductivity of Metal Rod Apparatus</p> <p><u>Specifications:</u></p> <p>The apparatus should consist of a copper bar, which is heated at one end, a heat sink is provided at other end. The test section of bar should be properly insulated & thermocouples are attached to observe the temperature gradient along the length of bar. Heat conducted through the section of bar is measured by heat collection in water cooled heat sink. Metal Bar-25 mm. \varnothing , of adequate length, provided with 8 thermocouples along the length, Band heater at one end and water cooled heat sink at other end. Test length of bar should be adequately insulated. Instruments panel comprising of-</p> <ol style="list-style-type: none"> a) Voltmeter ... 1 No. b) Ammeter ... 1 No. c) Dimmer 0-230v, 2A, capacity. d) Digital temperature Indicator <p>3 . Measuring flask and stop watch.</p> | 01 |
| 2. | <p>Thermal Conductivity of Liquid Apparatus</p> <p>Technical Specifications</p> <p>The apparatus should consists of hot plate or an electrical heater sandwiched between aluminum plates. The heat loss from hot plate needed to be prevented by using two guard heaters and heat of hot plate is made to flow through specimen. Cold plate on opposite face of liquid need to remove heat from liquid by circulation of wate. Input to heaters can be varied and measured. The temperatures are measured by a digital temperature indicator.</p> <ol style="list-style-type: none"> 1. Guarded hot plate assembly comprising of main heater, ring guard heater and top guard heater, mounted over the liquid test cavity. 2. Cold plate assembly provided with water connections. 3. The assembly is housed in a enclosure box with glass wool insulation. 4. Instruments panel consisting of - <ol style="list-style-type: none"> a) Digital voltmeter and ammeter of suitable range. b) Dimmer for controlling input to the heaters (2amp. 3 nos.) c) Multichannel digital temperature indicator | 01 No. |
| 3. | <p>Thermal Conductivity of Insulating Slab Apparatus</p> <p><u>Technical Specifications:</u></p> <p>The apparatus should consist of a slab assembly. The main heater and a radial guard heater should be sandwiched between copper plates. The specimen in the form of slabs of equal thickness should be placed on either sides of heaters and cooling plates through which water is circulated are on the other sides of specimen. Radial guard heaters ensures all heat of main heater passes axially through the specimens, which is collected by cooling plates. By knowing the temperatures and heat input, thermal conductivity of specimen can be calculated. The test set up should be enclosed in an enclosure with insulation inside to reduce radiation losses and to provide undisturbed surroundings.</p> <ol style="list-style-type: none"> 1. Heaters – | 1 No. |

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| | <p>i) Main Heater plate 100mm. dia. with mica heater sandwiched between copper plates.</p> <p>ii) Radial guard heater plate 120mm. I.D., 180mm OD mica heater sandwiched between copper plates.</p> <p>2. Water circulated cooling plates- 2nos.</p> <p>3. Dimmer 2 A, capacity, 2nos to independently control inputs to the heaters</p> <p>4. Measurements –</p> <p>i) A Voltmeter and an Ammeter with selector switches to measure inputs.</p> <p>ii) Multichannel digital temperature indicator to measure temperatures at various points, having 0.1°C least count.</p> | |
| 4. | <p>Heat transfer in Natural Convection Apparatus</p> <p><u>Technical Specifications:</u></p> <p>The apparatus should consist of of a vertical brass pipe heated by a cartridge heater inside. The pipe loses heat to atmosphere by natural convection. It should be fitted in an enclosure to provide undisturbed natural convection currents. Thermocouples are needed to be attached on the pipe to measure local temperatures. Heater input is measured on voltmeter and ammeter. The overall heat transfer coefficient and local heat transfer coefficients in natural convection could be measured at various heat transfer rates.</p> <p>1) Pipe - Brass pipe, 38 mm. dia. (OD), 500 mm. Long, fitted with cartridge heater inside.</p> <p>2) Thermocouples are fitted along the length of pipe for temperature measurement – 7 nos.</p> <p>3) Enclosure 200 mm. x 200 mm. x 800 mm. Size, with one side of perspex sheet.</p> <p>4) Measurements & Controls</p> <p>a) A dimmer stat for heater input control.</p> <p>b) Voltmeter and Ammeter for heater input Measurement.</p> <p>c) Multi channel digital temperature indicator</p> | 01 No. |
| 5. | <p>Heat Transfer in Forced Convection Apparatus</p> <p><u>Technical Specifications:</u></p> <p>The apparatus should consist of a circular pipe, losing heat by forced convection to air, being forced through it. Constant heat flux needed to be added to pipe by an electrical heater, provided with input control. The pipe surface temperature is measured at various points along the length of pipe. Temperatures of air at inlet and outlet of test section are measured. Thus local and overall heat transfer coefficients in forced convection, at various airflow rates and various heat flux values can be measured.</p> <p>1) Test pipe - 32 mm N B G. I. pipe, 500 mm. long, heated by band heater, out side.</p> <p>2) Centrifugal blower to force air through test pipe with flow control valve.</p> <p>3) Variac 2A capacity to control heater input.</p> <p>4) An orifice meter with differential water manometer.</p> | 01 No. |

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| | <p>5) Voltmeter and Ammeter to measure heater input.</p> <p>6) Multi channel digital temperature indicator to measures various temperatures.</p> | |
| 6. | <p>Condensation in Drop & Film Forms Apparatus</p> <p><u>Technical Specifications:</u></p> <p>The apparatus should consists of a transparent glass cylinder at the top of which two condensers hang and steam is admitted at the bottom. One of the condensers should be provided with chrome-plated surface for dropwise condensation and other with natural surface finish to promote filmwise condensation. Water is need to be circulated through the condensers from common inlet. The transparent glass cylinder allows visualisation of condensation process. A rotameter measures the water flow and a pressure gauge indicates the steam pressure. A digital temperature indicator measures temperatures at various points. Thus heat transfer coefficients in dropwise and filmwise condensation can be determined.</p> <p>1) Steam Generator - With 1.5 kw capacity water heater and heater control and pressure relief valve. Steam dryer to remove water droplets.</p> <p>2) Condensers -19 mm O. D. 150 mm long, chrome plated - 1No. (for condensation in drop forms) - 19 mm. O.D. 150 mm. long, natural finish – 1 No. (for condensation in film forms)</p> <p>3) Rotameter - 25 - 250 lph for cooling water flow measurement.</p> <p>4) Pressure Gauges-0 to 2.1kg/sq. cm</p> <p>5) Multi channel digital temperature indicator.</p> <p>6) Flow control valves for cooling water, steam control and drain.</p> <p>7) Measuring flask for condensate measurement.</p> | 1 No. |
| 7. | <p>Emissivity Measurement Apparatus</p> <p><u>Technical Specifications</u></p> <p>The apparatus should consist of a test plate and a comparator plate. A black plate is needed to be used as a comparator for test plate. When all the physical properties, dimensions and the temperatures are equal, heat losses from both plates will also be the same, except radiation losses. Hence the input difference will be due to difference in emissivity. Both the plates are needed to be kept in a panel enclosure with perspex front and should be given inputs through separate dimmer stats so that temperatures of both can be kept equal. Thus emissivity can determined over a wide range of temperatures.</p> <p>Test plate and Black plates - 160 mm. dia, aluminium plates, mounted in panel</p> <p>with mica heater inside.</p> <p>2) Instrumental panel consisting of</p> <p>a) Voltmeter and Ammeter for input measurement to both heaters through a selector switch.</p> <p>b) Dimmer, 2 amp. capacity. - 2 Nos.</p> <p>c) Multi channel digital temperature indicator.</p> | 01 No. |
| 8. | <p>Stefan Boltzmann Apparatus</p> <p><u>Technical Specifications:</u></p> <p>The Stefan Boltzmann constant is an important constant in heat transfer.</p> | 01 No. |

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| | <p>The apparatus determines Stefan Boltzmann constant. The apparatus should consist of a hemisphere surrounded by hot water. When the blackened disc is inserted at the center of hemisphere, heat is transferred to the disc from hemisphere by radiation and its temperature begins to rise, and from temperature rise rate. (It is need to be measured at the intervals of 5 sec.) Stefan Boltzmann constant is determined.</p> <ol style="list-style-type: none"> 1) Water heating tank provided with electric immersion heater. 2) Hemisphere made of copper sheet, 200mm. dia. surrounded by water jacket of 250mm. dia. 3) Test disc made of copper 20mm. dia. provided with thermocouple at the center. 4) Multi channel digital temperature indicator 0-200 °C with 0.1 °C least count to measure the temperature of hemisphere and disc. 5) Audible buzzer with timer to ring at every 5 seconds | |
| 9. | <p>Critical Heat Flux Apparatus : Concentric Tube Heat Exchanger</p> <p><u>Technical Specifications:</u></p> <p>The unit should consist of a copper tube inside a G. I. pipe. The hot fluid is hot water obtained from a water heater, which should flow through the inner tube and cold fluid i.e. cold water should flow through outer tubes. The hot water flows always in one direction while direction of cold water can be changed parallel or counter to hot water so that unit can be operated as parallel or counter flow heat exchanger. The temperature and flow rate of water are measured and heat transfer rate, LMTD, heat transfer coefficients and effectiveness of heat exchanger can be calculated.</p> <ol style="list-style-type: none"> 1) Heat exchanger- <ol style="list-style-type: none"> i) Outer tube 25 mm. N.B. 1m. long, G. I. ii) Inner tube 12 mm. O. D. 1m. long, copper. 2) Valve arrangement for parallel Flow/counter flow operation & flow control. 3) Water heater to obtain hot water, 3 Kw capacity with safety thermostat. 4) Thermometers to measure inlet and out let temperatures of hot and cold water. 5) Measuring flask and stopwatch for water flow measurement. <p>The unit is mounted over a sturdy frame. The unit is provided with antirust and attractive powder coating.</p> | 01 No. |

(TO BE SUBMITTED ALONG WITH TECHNICAL BID)

TENDER NOTIFICATION NO: -----

College Phone No:- 27296326

TENDER FORM

The Registrar,
Delhi Technological University,
Bawana Road,
Delhi-110042

We the undersigned (herein after called as Contractor/Vendors/Suppliers) hereby offer to execute supply of items as per specification against which we have quoted over rates and for which this tender may be accepted at the rates stated there in and subject to the terms & conditions set forth for such items as may be ordered by the Registrar, Delhi Technological University or officer acting on his behalf.

Date this _____ **Day of** _____

Signature of Contractor _____

Address _____

1. Guidelines/Procedure to be followed in introduction of 'e'-procurement solution:

1.Payment of cost of Tender documents: The collection of cost of Tender documents is dispensed away with, as there is no physical supply of tender documents and also to have absolute anonymity of bidder participating in e-procurement solution. The bidders can view/download the tender documents from the : <https://govtprocurement.delhi.gov.in> .

2.Submission of bids: The bidders who are desirous of participating in 'e'- procurement shall submit their price bids in the standard formats prescribed in the Tender documents, displayed at : <https://govtprocurement.delhi.gov.in>. The bidder should upload the scanned copies of all the relevant certificates, documents etc. in the: <https://govtprocurement.delhi.gov.in>. in support of their price bids. The bidder shall sign on all the pages of tender document ,statements and certificates uploaded by him, owning responsibility for their correctness/authenticity and copies thereof may also be submitted in the office of the Asst. Registrar(S&P), DTU along with original EMD..

3.Payment of Bid Security (Earnest Money Deposit): The EMD shall be in the form of the Demand Draft/Pay order of scheduled bank/Fixed Deposit Receipt of a scheduled bank issued in favour of **Registrar, Delhi Technological University, Delhi**. Zerox copy of the DD/PO/FDR is to be scanned and uploaded along with the bid, and the original DD/PO/FDR shall be sent to DTU so as to reach before the date and time of closing of the bids. Failure to furnish the original DD/PO/FDR before the closing of the bid, will entail rejection of bid and blacklisting.

4.Price Bid Opening: The Price Bids will be opened online by the concerned officer/officers at the specified date & time and the result will be displayed on the: <https://govtprocurement.delhi.gov.in>. which can be seen by all the bidders who participated in the tenders.

5.Processing of Tenders:The concerned officer/officers will evaluate and process the tenders as done in the conventional tenders and will communicate the decision to the bidder online.

6.Payment of Performance Guarantee: The successful tenderer shall furnish a bank guarantee/FDR of the value starting from 10% of the cost of the item for a period of sixty days beyond one year from a nationalized bank to ensure the satisfactory performance of item supplied. The performance guarantee is to be submitted at the time of installation / demonstration of equipments. In case the performance of the item is not found satisfactory, the amount of bank guarantee will be forfeited & credited in university account.

7. Participation of Bidders at the time of opening of bids: Bidders have two options to participate in tendering process at the time of opening of Bids:

(i). Bidders can come at the place of opening of bids (electronically) as done in the conventional tender process.

(ii). Bidders can visualize the process online.

8.Participation Financial Rules for e-procurement: The e-procurement system would be applicable for purchase of goods, outsourcing of services and execution of work as prescribed in GFRs.

ASSTT. REGISTRAR (S&P)
DELHI TECHNOLOGICAL UNIVERSITY,
SHAHBAD DAULATPUR, BAWANA ROAD,
DELHI – 110 042

TERMS AND CONDITIONS

TENDER FORMS ARE NOT TRANSFERABLE

Procedure for submission of bids: The bidders who are desirous of participating in 'e'-procurement shall submit their technical and price bids in the standard formats prescribed in the Tender documents, displayed at : <https://govtprocurement.delhi.gov.in>. The bidder should upload the scanned copies of all the relevant certificates, documents etc. after page number all documents and tender document and prepare an index there of in the: <https://govtprocurement.delhi.gov.in>. in support of their price bids. The bidder shall sign on all the statements, documents, certificates, uploaded by him, owning responsibility for their correctness/authenticity and copies thereof may also be submitted in the office of the Asstt. Registrar (S&P), DTU alongwith original EMD.

1. The Competent Authority of the University does not bind himself to accept the lowest or any tender.
2. ALTERATION IN THE SPECIFICATION.
 - (i) The specifications mentioned/issued with this form of tender must not be altered by the Suppliers.
3. INCOMPLETE TENDERS

Tender will not be considered if complete information is not given at the time of tendering or if the particulars and data (if any) asked for are not given.
4. CANCELLATION OF TENDER/ CONTRACT/ IN PART OR IN FULL IN CASE OF DEFAULT IN CONTRACT/SUPPLY:

If the Supplier, in the opinion of the Institute fails or neglects to comply with any of the terms & conditions forming, part of the order issued, the head of institute shall without prejudice to any other right or remedies under the contract, has the right to cancel the contract /order by giving 15 days notice in writing to the Suppliers/firms without being liable to pay compensation for such cancellation.
5. Tender shall be uploaded as per guidelines indicated for e-procurement solution.
6. Demonstration/ sample of equipments has to be arranged by the suppliers, if desired by the institute. The technical committee may visit production facility of so desired.
7. **The quotation should be valid for a period of one year from the date of opening of the tender.**
8. Rates are to be quoted in INR (Rupee terms) only and any revision thereof is not allowed after the tenders have been opened.
9. The delivery period should be clearly mentioned against each item, incase, the items are not readily available, ex-stock offer will be preferred.
10. Rates should be quoted F.O.R Institution. Sales tax/VAT/Octroi, Custom duty and other taxes leviable, should be mentioned clearly indicating weather these are to be charged extra or included in the quoted price.
11. Consignment will not be insured at the Institute / University Cost.
12. Preference will be given to quotation pertaining to indigenous products, However, where suitable substitutes are not available and item need to be imported the following clarification / information should be given.
 - (i) Whether the item will be imported by the intended tenderers against its own import license or university will have to provide Custom Exemption Certificate (CDE).
 - (ii) Name and address of the foreign supplier.

- (iii) Break up of CIF, and duty (if paid) should be given along with service charges if any.
 - (iv) Delivery period including information about mode of dispatch and possible duration (after dispatch) for receipt of item at the port.
 - (v) Whether the item required any special preparation for installation. In case yes, full details should be given regarding operation maintenance of the items.
 - (vi) In case of costly/sophisticated items whether the tenderers will arrange any special training regarding operation / maintenance of the items.
 - (vii) Nature of assurance for the supply of spares after the warranty period.
13. The payment will be made within 30 days after the successful demonstration/installation of the equipment. Rejected items/goods should also be removed within 30 days after which no responsibility will be accepted by University.
 14. Conditional quotations and/or incomplete quotations in any respect will be rejected.
 15. In case you cannot quote for one or more of the items asked for in the tender the word "NOT QUOTED" (in the rate column) should be indicated.
 16. The specification of the item quoted by the firm should confirm to the University specification. Confirmation, in this respect should be specifically mentioned in the tender. Where the tenderer feels that the specification of the item not fully given or differ, from the specification of the item mentioned by the university, the exact specification of such item should be attached with the tender indicating the item quoted.
 17. The Firm is required to link the University specifications with catalogues & leaflets/literature for each item. Details features, for compliance of specification should be provided on specification sheet & appropriate reference i.e. page no. & para of literature, leaflet wherefrom the relevant information has been checked, should be indicated.
20. **EARNEST MONEY:-** EMD should be attached with the technical bid. The EMD shall be in the form of the Demand Draft/Pay order of scheduled bank/Fixed Deposit Receipt of a scheduled bank issued in favour of **Registrar, Delhi Technological University, Delhi**. Zerox copy of the DD/PO/FDR is to be scanned and uploaded along with the bid, and the original DD/PO/FDR shall be sent to DTU so as to reach before the date of closing of the bids. Failure to furnish the original DD/PO/FDR before the closing of the bid, will entail rejection of bid and blacklisting. **If the tenderer after acceptance of the tender refused to take up the purchase order, his Earnest Money will be forfeited.** Any tender received without / less Earnest Money deposit shall be summarily rejected.
21. The Competent Authority reserves the right to reject any or all the tenders without assigning any reason, at any stage, and his decision will be final.
 22. The supplies shall have to be made within the period specified in the purchase order failing which the order shall be cancelled and the Earnest Money will be forfeited. However, in exceptional circumstance and, on written request, from the supplier/tenderer, extension of date for supply of the material will be considered. Extension in supply period is at the sole discretion of the competent authority.
 23. Service manuals, wherever available/ required, should be provided along-with the Equipments.
 24. A WARRANTY certificate should invariably be supplied along with the item at the time of delivery. Non-Compliance of the same will result in non-acceptance of the item from the firm with whom the order was placed beside rejection of the tender.
 25. The Competent Authority reserves the right to levy liquidated damages up to 2% of the value of the order for delayed supply. If the supply is delayed beyond the extended period, the University reserves the right even to cancel the order and forfeit the EMD of the firm/ tenderer.
26. **PERFORMANCE SECURITY DEPOSIT:-** The successful tenderer shall furnish a bank guarantee of the value starting from 10% of the cost of the item valid for a period of 60 days beyond one year from a nationalized bank to ensure the satisfactory performance of item supplied. The performance guarantee is to be submitted at the time of installation /

- demonstration of equipments. In case the performance of the item is not found satisfactory, the amount of bank guarantee will be credited in University account.
27. DEFAULT: - In the event of default and unsatisfactory service of the contractor/Supplier firm, the DTU will be at liberty to repair/get the item serviced from other party at the cost of supplier/ contractor/ tenderer.
 28. In case of software items, the suppliers should ensure that:-
 - i. Legal software is supplied in original sealed pouches / P. K. T.
 - ii. A license agreement is enclosed with it.
 - iii. A registration card is available for software.
 29. FAILURE AND TERMINATION: - If the Contractor / Supplier fails to deliver the stores or any installment thereof within the period fixed for such delivery or at any time repudiates the contract before the expiry of such period, DTU may without prejudice to the right of the purchaser may recover damages for breach of the contract.
 30. The technical & financial bids of only those bidders will be opened who fulfill the eligibility criteria and the required whose documents are found in order. If any of the date earmarked for opening of technical or financial bids happens to be holiday, the bids will be opened on the very next working day.
 31. For any query/clarification in r/o technical aspect of the enquiry, HOD (Chem), DTU may be contacted.

ASSTT. REGISTRAR (S&P)
DELHI TECHNOLOGICAL UNIVERSITY,
SHAHBAD DAULATPUR, BAWANA ROAD,
DELHI – 110 042

Technical Bid and**CHECK LIST OF DOCUMENTS TO BE SENT WITH TECHNICAL BID.****(A) PROFILE**

| | | |
|---|---|--|
| 1 | Name of the Tenderer (In block letters) | |
| 2 | Status of the firm i.e Public Ltd/ Pvt. Ltd /Partnership firm or Proprietorship firm. | |
| 3 | Name of the Director/Partner/Proprietor/ Authorized Signatory of the firm | |
| 4 | Complete address of the Firm with Phone No. | |

(B) OTHER DETAILS

| | | | PAGE NO. |
|---|---|--|----------|
| 1 | Tin/ work contract registration no. (Issued by Trade & Tax Department, GNCTD.) | Regn. No. _____ Copy of certificate attached YES/NO | |
| 2 | PAN number | No. -----Yes/No | |
| 3 | Service Tax registration Number | Regn. No. _____ Copy of certificate attached YES/NO | |
| 4 | Certificate having executed similar work/AMC in Govt. Offices/Public Sector Undertaking/ Edu. Institution | YES/NO | |
| 5 | EMD for Rs.----- | DD/FDR No. _____ Date _____ Name of Bank & Branch YES/NO | |
| 6 | Brochure/Leaflets/Technical Information of the item(s), if any | Yes/No | |
| 7 | All pages of Tender Document, duly signed. | Yes/No | |
| 8 | Detailed Technical specifications, Terms & Conditions and Delivery period to be submitted on firm's letter head. | Yes/No | |
| 9 | Warranty certificate. | Yes/No | |

Attach copies of above documents duly signed by Tenderer.

All the facts as stated above are true to the best of my knowledge and belief. Further I have gone through the terms & conditions and agreed to abide by the same.

Signature of the tenderer or the
Authorized Signatory with
Seal of the firm/company.

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