



भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान मोहाली

मानव संसाधन विकास मंत्रालय, भारत सरकार द्वारा स्थापित

सैक्टर 81, नॉलेज सिटी, प.ओ. मनोली, एस. ए. एस. नगर, मोहाली, पंजाब 140306

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH MOHALI

(Established by Ministry of Human Resource Development, Govt. of India)

Sector-81, Knowledge city, PO-Manauli, SAS Nagar Mohali-140306, Punjab

PAN No. - AAAAI1781K TAN NO. PTLI10692D

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CPPP/Institute Website

IISERM(842)17/18Pur/SP-II/02

Dated- 20th December 2017

E-TENDER NOTICE

Online tenders are invited on behalf of Director, IISER Mohali in **TWO BID SYSTEM** {Technical and Commercial} for the supply & installation of **Dilution Fridge** as per technical specification given below and BOQ list the original manufacturer/supplier at CPPP i.e. <https://eprocure.gov.in/eprocure/app>. Tender documents may please be downloaded from the E-procurement portal website <https://eprocure.gov.in/eprocure/app> & Institute website www.iisermohali.ac.in.

-sd-

(Mukesh Kumar)

Assistant Registrar (S&P)



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E-TENDER NOTICE

Tender Ref.- IISERM(842)17/18 Pur/SP-II/02

Dated :- 20th December 2017

Critical Date Sections

Sr.	Description	Date	Time
1.	Tender Publishing Date and time	20 th December 2017	6:00pm
2.	Tender Document download start Date & Time	20 th December 2017	6:00pm
3.	Bid Submission start Date & Time	20 th December 2017	6:00pm
4.	Bid Submission End date and Time	11 th January 2018	Upto 11:00am
5.	Tender opening Date and Time	12 th January 2018	At 11.30 am

Online tenders are invited on behalf of Director, IISER Mohali in **TWO BID SYSTEM** {Technical and Commercial separately} for following item(s) from the original manufacturer/supplier at CPPP i.e. <https://eprocure.gov.in/eprocure/app>. Tender documents may please be downloaded from the E-procurement portal website <https://eprocure.gov.in/eprocure/app> & Institute website www.iisermohali.ac.in. Tender fee in shape of DD/Banker Cheque of Rs 500/- (Non-refundable) and EMD of Rs. 11,00,000/- should be submitted by DD /Banker Cheque/FDR/ Bank Guarantee in favour of the Registrar, IISER Mohali payable at Mohali. However, scanned copy of the both tender fee and EMD should be upload on website along with technical bid part. The hard copy of the same in original to be send to the address mentioned below duly superscribing the supply/work name and reference/ tender ID on the envelope and same must reach before opening the bid and if not received within due date the bid will be rejected summarily.

The Original EMD and tender fee should be sent to:

Assistant Registrar (S&P)
Indian Institute of Science Education and Research,
Mohali Sector 81, SAS Nagar, Mohali, Punjab, India,
Pin: 140306

Non-receipt of original EMD and tender fee will lead to rejection of tender.

Item Details:-

Sr.	Details of Specifications	Qty.
01	Dilution Fridge/Refrigerator – {Technical Specifications as enclosed}	01

NB:- The online updated Price BOQ is in INR format. If bidder want to quote other than INR please specify the quoted currency in the technical bid/part and fill the amount in same updated BOQ.

SUBMISSION OF TENDER

- I. All bid/ tender documents are to be uploaded online at Central Public Procurement portal i.e. <https://eprocure.gov.in/eprocure/app> only and in the designated cover/ part on the website against tender ID. Tenders/ bids shall be accepted only through online mode and no manual submission of the same shall be entertained except tender fee and EMD. Late tenders will not be accepted.
- II. The online bids shall be opened at the office of the Assistant Registrar (P&S), IISER Mohali, on above given date and time. If the tender opening date happens to be on a holiday or non-working day due to any other valid reason, the tender opening process will be attended on the next working day at same time and place. IISER Mohali will not be responsible for any error like missing of schedule data while downloading by the Bidder.
- III. The bidder shall upload the tender documents duly filled in and stamped by the authorized signatory on each and every page. Tender not submitted/uploaded in the prescribed form and as per the tender terms and conditions shall be liable for rejection.
- IV. The bidder shall upload scanned copy of the PAN Card, GST number duly signed and stamped.
- V. E-procurement system ensures locking on the scheduled date and time. The system will not accept any bid after the scheduled date and time of submission of bid.

INSTRUCTIONS

1. The Online bids should be submitted directly by the original manufacturer/supplier, If quotation is submitted/filled by any representative/agent/dealer then they must upload a authority certificate from the principal company for quoting the price otherwise such quotation will be rejected.
2. The quantity mentioned in this inquiry is and shall be deemed to be only approximate and will not in any manner be binding on the Institute. Before the deadline for submission of the online bid, IISER Mohali reserves the right to modify the tender document terms and conditions. Such amendment/modification will be notified on website against said tender ID
3. The rates offered should be FOR Chandigarh/Mohali in case of firms situated outside Chandigarh/Mohali, and free delivery at the Institute premises in case of local firms. Supplier from outside India should mention the Ex-works/FOB/FCA/CIF/CIP price clearly. Conditional tenders will be summarily rejected.
4. In case of Ex-godown terms the amount of packaging forwarding freight etc. should clearly be indicated by percentage or lump sum amount. Institute has policy not to make any advance payments towards any purchase, Letter of credit can be opened if required.

5. THE INSTITUTE IS EXEMPTED FROM EXCISE AND CUSTOM DUTY under notification no- 51/96 – CUSTOM DATED 23/7/1996 AND DSIR REGISTRATION NO TU/V/RG/-CDE(1062)/2016 DT. 30/08/2016 / EXCISE NOTIFICATION NO. 10/97- CENTRAL EXCISE DT. 01.03.1997.
6. Tax: This Institute is not exempted from the payment of GST. The current rate (i.e. percentage of Sales Tax should be clearly indicated included or excluded) wherever chargeable. Please also provide/upload the copy of PAN card, GST number duly self-attested.
7. The delivery period should be specifically stated. Earlier delivery will be preferred.
8. The firms are requested to provide/upload detailed description and specifications together with the detailed drawings, printed leaflets and literature of the article quoted. The name of the manufactures and country of manufacture should also invariably be stated. In the absence of these particulars, the quotation is liable for rejection.
9. Validity of offer: 90 days. The warranty period after satisfactory installation should be mentioned and firm should replace all manufacturing defect parts/ whole item under warranty without any extra cost including clearance, freight, taxes. Security deposit/ Bank Performance Guarantee @ 10 % of the value of supply order as per norms may be sought from the firms.
10. The right to reject all or any of the quotation and to split up the requirements or relax any or all the above conditions without assigning any reason is reserved by the IISER Mohali. For any corrigendum and addendum please be checked the website <https://eprocure.gov.in/eprocure/app> and <http://www.iisermohali.ac.in>
11. Disputes, if any, shall be subject to jurisdiction in the court of Mohali only.

-sd/-
(Mukesh Kumar)
Assistant Registrar (S&P)

Please quote for a wet system as per the specifications given below. The final decision on the purchase will be made by the purchase committee at IISER Mohali after evaluation.

A cryogen-free system of similar specification (within technical constraints) will also be considered in case the price of the wet system does not fall under the budget limit. A wet system will get higher priority than a dry system with equivalent specs, regardless of their price (within the limit).

The vendors must fill the technical compliance sheet point wise, provided at the end of this document without changing the given format. Information for each and every point must be provided in as much detail as possible in the compliance sheet. **The bids without such a filled compliance sheet will be rejected.**

1. The base temperature of the configured system must be **10 mK** or below without experimental load by the customer. If the vendors cannot meet this spec, they must clearly specify what will be the lowest possible temperature. In case, the price becomes a constraint, higher temperatures (**not above 20 mK**) may also be considered.
2. At **100 mK**, cooling power for the mixing chamber stage must be one of the following:
 - A. **400 microwatt** (Guaranteed) or above.
 - B. **300 microwatt** (Guaranteed) or above.Vendor must quote for both 300 microwatt and 400 microwatt cooling power (100 mk) separately if such options are available. The goal of IISER will be to buy a system with highest possible cooling power and lowest possible temperature within the available funds.
3. **Experimental Wiring:**
 - A. 18 twisted pairs (total 36, manganin wires will be preferred) for DC connections initiated at 2 19-pin connectors (D connectors will be preferred) at the top and terminated to 19-pin connectors (D connectors will be preferred) at mixing chamber plate. 6 pairs of superconducting wires separately initiated at connector/s at top and terminated at sample space for DC connections to piezo.
 - B. 6 demountable (from any plate) high frequency (10 GHz, 50 ohm characteristic impedance) semi-rigid coaxial cables initiated at sma-female connectors at top and terminated at mixing chamber plate.
 - C. All the wirings should be thermally anchored at appropriate stages.
 - D. Extra set of thermal anchors, like bobbins for future wiring of extra 18 pairs of wires should be provided at multiple stages.
 - E. Multi mode/ single mode (decision will be made as per the experimental requirements at purchase stage) optical fiber down to 30 mm below the magnet center.
4. Sample space must have minimum 60 mm or 38 mm of diameter. Please quote for both the options separately along with the magnet bore size, specified at item no.10. Depending upon the availability of the funds IISER Mohali will go for the suitable option.
5. 1 central line-of-sight port of minimum 20 mm. of i.d. (>30 mm. is preferable) down to mixing chamber plate for central sample stage delivery system mentioned in point '6.'. Extra non line-of-sight and line-of-sight ports for flexible wiring and high frequency application (typically 10 GHz) respectively. The unused line-of-sight and non line-of-sight ports must be blanked and shielded properly. Blank and radiation shield option for the central port, as well, in case central sample delivery probe is not in use (in case the system is used in "bottom-loading mode").

6. The system must be of “top-loading” type. Central vacuum load-lock sample stage delivery mechanism with all necessary gate valve/s, tubing/s, externally controlled shutters and pumping ports etc. must be provided. Vendors must quote for the manipulator and sample-stage (customized for above mentioned connections) separately.
7. **Dewar:** A highly insulated multi layered dewar with minimum 200 litre belly capacity. The loss should be (without using reliquefier) **no more than 10 litre/day (with 1K pot running)**.
8. **Helium Reliquefier:** Quote for appropriate reliquefier that will eliminate the need of refill liquid helium with the refrigerator and magnet, running.
Also quote for the reliquefiers as specified below:
 - A. Liquefy ≥ 15 L/day of helium from room temperature gas and re-liquefy and re-condense ≥ 27 L/day of helium from a cryostat (direct recovery).
 - a. With nitrogen reliquefier (if LN2 cooled dewar is provided).
 - b. Without nitrogen reliquefier.

Depending on the availability of funds, two reliquefiers may be purchased – vendors must quote for two reliquefiers.. **Cryomech** reliquefiers will be preferred.

9. **Insert and top flange:**
 - A. A top-flange assembly, including radiation baffle and all necessary ports like pumping ports etc. 3 spare 0.75” o.d. tube (Clear shot down to top of the magnet) with 3 1/8 CF flange on top.
 - B. IVC with tail to fit the superconducting magnet bore as specified under point '10'.
 - C. Central sample delivery mechanism, mentioned in point '6.'
 - D. Option for extra wiring (18 pairs of dc and 6 high frequency lines) rather than that mentioned in point '3.' down to the mixing chamber plate for the customers should be provided (connectors and wiring are not needed). The through-holes on the dilution plates must be blanked properly.
 - E. All Helium vent and pressure-relief ports should be compatible with a **cryomech reliquefier**.

10. **Superconducting Magnet Specification:**

The magnet should be bottom loading. Please quote **for all** separately.

- A. The central field should be one of the following at 4.2 K :
 - a. 16 Tesla single axis
 - b. 18 Tesla single axis
- B. 0.1% central main coil homogeneity over 10 mm DSV for the vertical field.
- C. It should have a minimum clear bore of diameter 76.2 mm for 60 mm sample space and 52 mm for 38 mm sample space respectively.
- D. **Persistent switch** must be installed so that the magnet can run in the “persistent” mode with full vector field.
- E. Magnet should be fully **protected against any damage due to quench**.

11. **Superconducting magnet power supply:**

- A. 4-quadrant, true bi-polar system/s featuring smooth sweeps through zero.

- B. Automatic quench detection and protection.
- C. Display, clearly indicating output current, voltage, limit settings and system status
- D. Current settability of 0.1 mA or better
- E. Persistent switch heater power supply (for persistent mode magnet option only)
- F. Computer interface (GPIB and Ethernet)
- G. Safety interlocks for persistent switch enable/ disable and changing of important magnet parameters and limits
- H. Visual confirmation of current, present in leads must be provided.
- I. Remnant field correcting mechanism should also be provided.

12. Thermometers and Heaters:

- A. Thermometers only with **negligible magnetoresistance at highest magnetic field** should be provided. Detailed magnetic field dependent calibration data of all the thermometers must be provided.
 - B. Thermometers should be installed in all stages for monitoring temperature in presence and absence of magnetic field.
 - a. Mixing chamber plate and cold plate must have highly calibrated (0.1 mK resolution at 10 mK) temperature sensors installed.
 - b. Two Cernox thermometers should be installed on the magnet for continuous monitoring of magnet temperature (both top and bottom).
 - C. All necessary heaters must be installed including at IVC sorb and mixing chamber plate.
 - D. Detailed specifications of all the heaters and thermometers have to be mentioned by the vendor.
 - E. **All thermometers used in the system must be calibrated down to the relevant temperatures.** All calibration data for all the thermometers must be provided.
13. Automatic temperature controller with GPIB interfacing, auto tuning PID, alarm and relay must be provided. Temperature should be steadily controllable by 0.1 mK precision. Stability range must be provided in technical quotation. Lakeshore temperature controllers will be preferred.
14. A liquid helium and nitrogen level meter and read out with interfacing option, sample and hold operation, burnout protection and de-ice cycle must be provided.
15. **Gas Handling system:** Manual (preferable) or automatic gas handling system with all the necessary gauges and components must be provided for smooth operation. **The vendors must quote for the manual option and the automatic option separately.**
- Liquid nitrogen trap and liquid nitrogen dewar must be quoted separately. He3 flow meter must be provided.
16. All the necessary accessories for running the system efficiently must be provided. This includes the pumps, compressors, valves, gauges, lines, transfer tubes etc.
17. Enough helium mixture must be provided for attaining the mentioned base temperature and cooling power.
18. Vendors must clearly mention the followings. These will be considered seriously for making a decision.
- A. Time required for the cryostat to complete cool down from room temperature to base

temperature.

- B. Sample exchange time
- C. Sample insertion to base temperature time while running.
- D. Full warm-up time with and without warm-up heater (if such option is available).

19. **Additional features:** Vendor must clearly mention what additional features they can provide.

NOTE:

- A. All the components used should be non-magnetic.
- B. The price should be quoted for all components separately and their installation.
- C. The final decision on purchase will be made after evaluating the technical and the financial bids. The L1 bidder may be rejected even after opening the financial bid if it is found that the higher bidders provide significantly better system (in terms of specifications) at reasonable cost. The purchase committee will have the right to make the final decision.
- D. **IMPORTANT:** The delivery date **should be preferably within 12 months** from the date of purchase order. In case the vendors request amendments to the purchase order, the time will be counted from the date of first purchase order (before amendments, if any).

Compliance Sheet

Specifications	Vendors' comment
1. Mention the base temperature of the configured system without experimental load by the customer.	
2 At 100 mK , cooling power for the mixing chamber: A. 400 microwatt (Guaranteed) or above. B. 300 microwatt (Guaranteed) or above.	
3 <u>Experimental Wiring:</u> a. 18 twisted pairs (total 36, manganin wires will be preferred) for DC connections initiated at 2 19-pin connectors (D connectors will be preferred) at the top and terminated to 19-pin connectors (D connectors will be preferred) at mixing chamber plate. 6 separate superconducting wires initiated at connector/s at top and terminated at sample space for DC connections to piezo. b. 6 demountable (from any plate) high frequency (10 GHz, 50 ohm characteristic impedance) semi-rigid coaxial cables initiated at sma-female connectors at top and terminated at mixing chamber plate. c. All the wirings should be thermally anchored at appropriate stages. d. Extra set of thermal anchors, like bobbins for future wiring of extra 18 pairs of wires should be provided at multiple stages. e. Multi mode/ single mode (decision will be made as per the experimental requirements at purchase stage) optical fiber down to 30 mm below the magnet center.	
4 60 mm minimum sample space. 38 mm minimum sample space.	
5 1 central line-of-sight port of minimum 20 mm. of i.d. (>30 mm. is preferable) down	

Specifications	Vendors' comment
<p>to mixing chamber plate for central sample stage delivery system mentioned in point '6.!</p> <p>Extra non line-of-sight and line-of-sight ports for flexible wiring and high frequency application (typically 10 GHz) respectively.</p> <p>The unused line-of-sight and non line-of-sight ports must be blanked and shielded properly.</p> <p>Blank and radiation shield option for the central port, as well, in case central sample delivery probe is not in use.</p>	
<p>6 The system must be of “top-loading” type. Central vacuum load-lock sample stage delivery mechanism with all necessary gate valve/s, tubing/s, externally controlled shutters and pumping ports etc. must be provided.</p> <p>Vendors must quote for the manipulator and stage (customized for above mentioned connections) separately.</p>	
<p>7 Dewar: A highly insulated multi layered dewar with minimum 200 litre belly capacity.</p> <p>The loss should be (without using reliquefier) no more than 10 litre/day (with 1K pot running).</p>	
<p>8 Helium Reliquifier: Quote for appropriate reliquefier that will eliminate the need of refill liquid helium with the refrigerator and magnet, running.</p> <p>Also quote for the reliquefiers as specified below:</p> <ol style="list-style-type: none"> a. Liquefy ≥ 15 L/day of helium from room temperature gas and re-liquefy and re-condense ≥ 27L/day of helium from a cryostat <ol style="list-style-type: none"> i. With nitrogen reliquefier (if LN2 cooled dewar is 	

Specifications	Vendors' comment
<p>provided).</p> <p>ii. Without nitrogen reliquefier.</p> <p>b. Liquefy ≥ 10 L/day of helium from room temperature gas and re-liquefy and re-condense ≥ 18 L/day of helium from a cryostat</p> <p>i. With nitrogen reliquefier (if LN2 cooled dewar is provided).</p> <p>ii. Without nitrogen reliquefier.</p> <p>Is it a Cryomech reliquefier?</p>	
<p>9 <u>Insert and top flange:</u></p> <p>a. A top-flange assembly, including radiation baffle and all necessary ports like pumping ports etc. 3 spare 0.75" o.d. tube (Clear shot down to top of the magnet) with 3 1/8 CF flange on top.</p> <p>b. IVC with tail to fit the superconducting magnet bore as specified under point '9.'</p> <p>c. Central sample delivery mechanism, mentioned in point '6.'</p> <p>d. Option for extra wiring (18 pairs of dc and 6 high frequency lines) rather than that mentioned in point '3.' down to the mixing chamber plate for the customers should be provided (connectors and wiring are not needed). The through-holes on the dilution plates must be blanked properly.</p> <p>e. All Helium vent and pressure-relief ports should be compatible with a cryomech reliquefier.</p>	
<p>10 <u>Superconducting Magnet Specification:</u> The magnet should be bottom loading. Please quote for all separately.</p> <p>a. The central field should be one of the following at 4.2 K :</p> <p>i. 16 Tesla single axis</p> <p>ii. 18 Tesla single axis</p>	

Specifications	Vendors' comment
<ul style="list-style-type: none"> b. 0.1% central main coil homogeneity over 10 mm DSV for the vertical field. c. It should have a minimum clear bore of diameter 76.2 mm for 60 mm sample space and 52 mm for 38 mm sample space respectively. d. Persistent switch must be installed so that the magnet can run in the “persistent” mode with full vector field. e. Magnet should be fully protected against any damage due to quench. 	
<p>11 <u>Superconducting magnet power supply:</u></p> <ul style="list-style-type: none"> a. 4-quadrant, true bi-polar system/s featuring smooth sweeps through zero. b. Automatic quench detection and protection. c. Display, clearly indicating output current, voltage, limit settings and system status d. Current settability of 0.1 mA or better e. Persistent switch heater power supply (for persistent mode magnet option only) f. Computer interface (GPIB and Ethernet) g. Safety interlocks for persistent switch enable/ disable and changing of important magnet parameters and limits h. Visual confirmation of current, present in leads must be provided. i. Remnant field correcting mechanism should also be provided. 	
<p>12 <u>Thermometers and Heaters:</u></p> <ul style="list-style-type: none"> a. Thermometers only with negligible magnetoresistance at highest magnetic field should be provided. Detailed magnetic field dependent calibration data of all the thermometers must be provided. 	

Specifications	Vendors' comment
<p>b. Thermometers should be installed in all stages for monitoring temperature in presence and absence of magnetic field.</p> <ul style="list-style-type: none"> i. Mixing chamber plate and cold plate must have highly calibrated (0.1 mK resolution at 10 mK) temperature sensors installed. ii. Two Cernox thermometers should be installed on the magnet for continuous monitoring of magnet temperature (both top and bottom). <p>c. All necessary heaters must be installed including at IVC sorb and mixing chamber plate.</p> <p>d. Detailed specifications of all the heaters and thermometers have to be mentioned by the vendor.</p> <p>e. <u>All thermometers used in the system must be calibrated down to the relevant temperatures.</u> All calibration data for all the thermometers must be provided.</p>	
<p>13 Automatic temperature controller with GPIB interfacing, auto tuning PID, alarm and relay must be provided. Temperature should be steadily controllable by 0.1 mK precision. Stability range must be provided in technical quotation. Lakeshore temperature controllers will be preferred.</p>	
<p>14 A liquid helium level meter and read out with interfacing option, sample and hold operation, burnout protection and de-ice cycle must be provided.</p>	
<p>15 <u>Gas Handling system:</u> Manual (preferable) or automatic gas handling system with all the necessary gauges and components must be provided for smooth operation. <u>The vendors must quote for the manual option and the automatic option separately.</u></p>	

Specifications	Vendors' comment
Liquid nitrogen trap and liquid nitrogen dewar must be quoted separately. He3 flow meter must be provided.	
16 All the necessary accessories for running the system efficiently must be provided. This includes the pumps, compressors, valves, gauges, lines, transfer tubes etc.	
17 Enough helium mixture must be provided for attaining the mentioned base temperature and cooling power.	
<p>18 Vendors must clearly mention the followings. These will be considered seriously for making a decision.</p> <ul style="list-style-type: none"> a. Time required for the cryostat to complete cool down from room temperature to base temperature. b. Sample exchange time c. Sample insertion to base temperature time while running. d. Full warm-up time with and without warm-up heater (if such option is available). 	
19 Additional features: Vendor must clearly mention what additional features they can provide.	
<p>NOTE:</p> <ul style="list-style-type: none"> a. All the components used should be non-magnetic b. The price should be quoted for all components separately and their installation c. The final decision on purchase will be made after evaluating the technical and the financial bids. The L1 bidder may be rejected even after opening the financial bid if it is found that the higher bidders provide significantly better system (in terms of specifications) at reasonable cost. The purchase committee will have the right to make the final decision. 	

Specifications	Vendors' comment
<p>d. IMPORTANT: The delivery date should be preferably within 12 months from the date of purchase order. In case the vendors request amendments to the purchase order, the time will be counted from the date of first purchase order (before amendments, if any)</p>	