

## IISc/INF/2023

*Request for quote (RFQ) from domestic (India-based) manufacturers,  
Indian OEM or its authorized Indian distributor for Components of  
Helium Recovery, Storage and Liquefaction System*

*Tender Floating Date: 02/01/2024*

*Last Date for requesting Pre-Bid Clarifications: 10/01/2024*

*Last Date for Posting of Final Revised Tender: 16/01/2024*

*Last Date for Final Bid Submission: 23/01/2024*

This is an RFQ for Installation of components of a Helium Recovery, Storage and Liquefaction Plant. The Plant will be installed at the Institute NMR Facility (NMR) at the Indian Institute of Science, Bangalore.

The quotation should clearly indicate the terms of delivery, installation, delivery and installation schedule, estimated date for commissioning and validation, and payment terms. **The tender should be submitted in two separate sealed envelopes – one containing the technical bid and the other containing the commercial bid, both of which should reach us, duly signed on or before .....**

**Note:** *The Bidder should belong to either class 1, class 2 or MSME supplier distinguished by their “local content declaration” as defined by recent edits to GFR. They should mention clearly which class they belong to in a cover letter.*

a) *Class 1 supplier: Goods and services should have local content of equal to or more than 50%.*

b) *Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.*

*Purchase preference as defined by the recent edits to GFR (within the “margin of purchase preference”) will be given to Class-1 supplier.*

**The quotations should be on FOR-IISc Bangalore basis in INR only.**

The bids should be addressed and sent to:

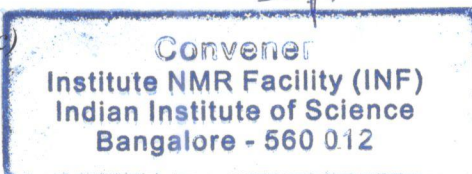
*The Convener*

*Institute NMR Facility (INF)*

*Indian Institute of Science (IISc)*

*Bengaluru, India - 560012.*

*Ph: +91-80-2293-3302*



*Emails regarding any technical clarifications/queries should be sent to: [eprabhak@iisc.ac.in](mailto:eprabhak@iisc.ac.in)  
and CC to [sunitar@iisc.ac.in](mailto:sunitar@iisc.ac.in)*

<b>Table of Contents</b>		
S.No.	Section Title	Page Number
1.	Technical Specifications and Requirements	3-6
2.	Terms and Conditions	6-7
3.	Check List to be Submitted along with Technical Bid	8
4.	Check List to be Submitted along with Commercial Bid	9
5.	Annexure-1: Details of the Bidder	10
6.	Annexure-2: Declaration regarding experience	11
7.	Annexure-3: Declaration regarding track record	12
8.	Annexure-4: Declaration for acceptance of terms and conditions	13
9.	Annexure-5: Declaration to provide Technical Compliance Sheet	14
10.	Annexure-6: Declaration to provide Make and Manufacturer Details	15
11.	Annexure 7: Declaration of Undertaking for Complete Installation of a functional Helium Recovery, Storage and Liquefaction Plant	16
12.	Annexure 8: Declaration to provide Masked Price Bid (Note that the pricing information should be masked)	17
13.	Annexure 9: Declaration to provide Technical specifications, Brochures and additional certifications where required	18

## Technical Specifications and Requirements for Helium Recovery, Storage and Liquefaction System at Institute NMR Facility (INF), IISc, Bangalore

S. No	Detailed technical specifications
1.	<p style="text-align: center;"><b>Liquefier System:</b></p> <ul style="list-style-type: none"> <li>• Liquefaction Rate: <math>\geq 22</math> l/day @ less than 4psi liquefaction pressure.</li> <li>• Cryo-coolers: Pulsed-Tube cooler, capable of continuous operation over long-time scales without manual intervention. All necessary accessories like helium hoses and air/water-cooled compressors required for routine operation should be included.</li> <li>• Initial cool down time: Every time there is a restart of the liquefier, it should take less than 40 hours from initial start-up to full liquefaction rate without the need of any pre-cooling agent like liquid nitrogen or helium.</li> <li>• Liquefier storage dewar capacity of about 250 L.</li> <li>• The dewar should be equipped with a liquid helium level sensor with an electronic level monitor.</li> <li>• The Dewar should be equipped with appropriate pressure regulating and safety devices.</li> <li>• The liquefier pressure should be controllable during transfer and should be equipped with a pressure monitor. The liquid helium transfer operation should be close to ambient pressures, without need for additional helium gas.</li> <li>• Suitable high-pressure and low-pressure precision regulators should be included.</li> <li>• One outlet ports (1/2 inch or larger, Wilson seal) and 12 mm transfer tube should be able to go straight down to the bottom of the liquefier.</li> <li>• Control System: The control system should be fully automated.</li> <li>• An Internet-enabled computer system and software should be provided to monitor and operate the helium liquefier.</li> <li>• A remote monitoring system with an additional computer or laptop control system should be provided.</li> <li>• All the thermometers, pressure gauges and level sensors, etc. and all other measuring / sensor devices, used should be calibrated and integrated with the control system which should be monitored on the computer system through the supplied software.</li> <li>• The software should have a provision for a historical log of all sensor parameters and a provision for exporting the data to MS Excel for data analysis.</li> <li>• Electrical Power: The operating voltage and power supply requirements for the helium liquefier should be as per regulations at the installation site and should be clearly mentioned.</li> <li>• In case of power shutdown; if the liquefier has no power backup from a UPS, the liquefier should smoothly go to a stand-by mode until power is restored.</li> <li>• A UPS (Uninterrupted Power Supply) of appropriate capacity should be provided to ensure that power spikes do not cause damage to the entire liquefier unit.</li> <li>• Water chilling unit of appropriate tonnage for the helium compressor of liquefaction system.</li> </ul>

	<ul style="list-style-type: none"> <li>Mention and provide all other essential accessories for the helium liquefier.</li> </ul>
2.	<p style="text-align: center;"><b>Additional Dewar:</b></p> <ul style="list-style-type: none"> <li>Capacity: One transportable LHe Dewar should be provided with a capacity of a minimum of 150 L, and the evaporation rate should be less than 1% of total capacity per day.</li> <li>The dewar should be firmly weld-mounted in a dolly set-up on casters for easy movement.</li> <li>Total height including the dolly and wheel casters should be less than or equal to 8 feet.</li> <li>The Dewar should be equipped with appropriate pressure regulating and safety devices.</li> <li>The dewar should be equipped with a liquid helium level sensor with an electronic level monitor.</li> <li>An appropriate liquid helium transfer line for dewar should be provided such that their ends are matching with storage and transfer dewar.</li> <li>The Dewar should be crack tested, and the appropriate crack test certificate should be provided.</li> <li>An appropriate liquid helium transfer line for dewar should be provided. The size of this should be such the liquid helium transfers from the supplied storage dewar to the transportable Dewar can be performed in a room with 11 ft ceiling clearance.</li> </ul>
3.	<p style="text-align: center;"><b>Recovery and Storage system:</b></p> <ul style="list-style-type: none"> <li>Type: Recovery bag (balloon) for High-pressure recovery system</li> <li>A recovery bag of at least 300 cft volume including controls for compressor and safety valves should be provided.</li> <li>Synchronized control with gas bag, for compressor ON/OFF function at desired (variable) threshold volume levels of gas in the bag.</li> <li>Laser height sensors or any other suitable sensors based on micro-switches.</li> <li><b>Helium high pressure compressor</b></li> <li>Maximum inlet pressure should be in the range of 1 to 1.3 PSIG</li> <li>Discharge pressure 2400 psig</li> <li>Flow-rate capacity: <math>\geq 5</math> SCFM</li> <li>It should operate with 415 V <math>\pm 5\%</math> @ 50 Hz, 3-phase (as per power regulations in the installation site).</li> <li>Cooling: air-cooled.</li> <li>Should include safety relief valves and automated safety shutdown mechanisms.</li> <li>ON/OFF of the recovery compressor should be seamlessly integrated with the gas bag level sensor.</li> </ul>
4.	<p style="text-align: center;"><b>Purifier:</b></p> <ul style="list-style-type: none"> <li>Liquid nitrogen trap</li> <li>Purity of the output gas should be 99.99% or better.</li> <li>Provide a heating blanket for faster regeneration.</li> <li>Helium gas flow rate in the range from 0 to 30 slpm</li> </ul>

	<ul style="list-style-type: none"> <li>• Provide a Scroll pump for purifier regeneration.</li> <li>• Regeneration Time <math>\leq 8</math> hours</li> <li>• The system should have a separate adsorber unit for moisture removal. At least two of these should be provided – one to be used while the other regenerates. A regeneration kit and fittings should be provided.</li> <li>• The vendor should carry out the integration of the purifier with the liquefier and high-pressure gas storage.</li> <li>• Purity meter to monitor input and output and cut-off gas input supply as required, should be provided.</li> <li>• Provide 5TR @ 15 deg C water chiller with &gt; 1 year warranty.</li> <li>• Appropriate UPS with 30 min backup to be provided for power back up of both liquefier and purifier – according to power requirements (e.g. 40 KVa) 3 phase.</li> </ul>
<p>5.</p>	<p><b>Helium recovery, storage and liquefaction plant requirements:</b></p> <ul style="list-style-type: none"> <li>• An Internet-enabled computer system and software should be provided to monitor and operate the LHe plant.</li> <li>• A remote monitoring system with an additional computer or laptop control system should be provided.</li> <li>• All the thermometers, pressure gauges and level sensors, etc. and all other measuring / sensor devices, used should be calibrated and integrated with the control system which should be monitored on the computer system through the supplied software.</li> <li>• The software should have a provision for a historical log of all sensor parameters and a provision for exporting the data to MS Excel for data analysis.</li> <li>• Electrical Power: The entire liquid helium plant should operate at 415 V <math>\pm 5\%</math> @ 50 Hz, 3-Phase power supply (as per power regulations in the installation site).</li> <li>• After complete installation of the plant, the vendor must demonstrate &gt;95% recovery of the helium evaporating from the NMR spectrometers and all other points of helium boiloff during the period of warranty.</li> <li>• The vendor has to make sure all the technical calculations and component compatibility (eg. pressure, number of monitors, bag size, etc.) are verified for seamless installation of the final plant, complete in all aspects. Any discrepancies in the technical aspects must be brought for discussion as part of the pre-bid clarifications by the vendor. INF, IISc, will not be responsible for any oversights in technical calculations.</li> <li>• The vendor may suggest optional / alternate components for the seamless functioning of the installed plant.</li> </ul>
<p>6.</p>	<p><b>Warranty:</b></p> <ul style="list-style-type: none"> <li>• Minimum 3 Years of warranty on all components including the flow monitors, balloon system, compressor system, purifier system, vacuum pumps, chiller, liquefier system, after successful installation. Annual Maintenance prices for the 4<sup>th</sup> and 5<sup>th</sup> year may be quoted.</li> <li>• The spare parts and essential maintenance components (e.g. filters, desiccant, adsorbent, etc.) for the regular maintenance of</li> </ul>

	components (including compressor, purifier, liquefier, etc.) for the warranty period, should be provided.
--	---

## ***I. Terms and conditions***

- I.1.* The installation of each component and all its accessories shall be carried out by respectively qualified personnel, either employed or contracted by the vendor.
- I.2.* The price quotation should include the cost of installation, integration, validation, and training of potential users.
- I.3.* The system should be provided with at least 3-years of warranty on all parts, from the date of installation.
- I.4.* The vendor must provide routine maintenance of the associated equipment that is part of this tender.
- I.5.* The vendor should have qualified technical service personnel for the equipment based in India and should assure a response time of less than 48 hours. The contact information of the qualified technical service people should be provided.
- I.6.* Vendor must provide a user list (with contact details including emails and phone numbers) of at least 5 customers from Indian Institutes/Labs where similar systems have been installed.
- I.7.* The lead-time for delivery of the equipment should not be more than 6 months from the date of receipt of our purchase order.
- I.8.* The indenter reserves the right to withhold placement of final order. The right to reject all or any of the quotations and to split up the requirements or relax any or all of the above conditions without assigning any reason is reserved.
- I.9.* Wherever requested data must be supplied along with technical compliance documents. Technical bids without supporting data will be deemed as technically non-compliant.
- I.10.* All guaranteed specifications will have to be demonstrated at the time of installation. Any necessary standard samples for that purpose should be brought by the service engineers.
- I.11.* Printed literature and published papers in support of all compliance to the prescribed specifications may be provided.
- I.12.* Technical evaluation by the institute may include demonstration to verify functionalities and capabilities of the system quoted. Any discrepancy between the promised specifications and measurements will be deemed as technical non-compliance.
- I.13.* The Bidder's firm should have existence for a minimum of 3 years. Enclose Company Registration Certificate and Balance Sheet of last three years.
- I.14.* The Bidder should belong to either class 1 or class 2 supplier distinguished by their "local content" as defined by recent edits to GFR. They should mention clearly which class they belong to in the cover letter
  - a) Class 1 supplier: Goods and services should have local content of equal to or more than 50%.
  - b) Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.

Purchase preference as defined by the recent edits to GFR (within the “margin of purchase preference”) will be given to Class-1 supplier.

- 1.15. The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per -Annexure 4.
- 1.16. The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect has to be given as per Annexure 3.
- 1.17. Bidders offering imported products will fall under the category of non-local suppliers. They cannot claim themselves as Class-1 local suppliers/Class-2 local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training, and other sales service support like AMC/CMC, etc., as local value addition.
- 1.18. MSMEs can seek an exemption to some qualification criteria. IISc follows GFR2017 for such details.

**Installation Requirements**

**Check List to Be Submitted Along with Technical Bid**

Please Attach Documents in the order given below.

S.No.	Section Title	Document Provided (Yes/No).	Document Page Number(s)
1.	Signed Check List for Technical Bid (this page)		
2.	Annexure-1: Details of the Bidder		
3.	Annexure-2: Declaration regarding experience		
4.	Annexure-3: Declaration regarding track record		
5.	Annexure -4: Declaration for acceptance of terms and conditions		
6.	Annexure-5: Declaration to provide Technical Compliance Sheet		
7.	Annexure-6: Declaration to provide Make and Manufacturer Details		
8.	Annexure 7: Declaration of Undertaking for Complete Installation of a functional Helium Recovery, Storage and Liquefaction Plant		
9.	Annexure 8: Declaration to provide Masked Price Bid (Note that the pricing information should be masked)		
10.	Annexure 9: Declaration to provide Technical specifications, Brochures and additional certifications where required		

I hereby declare all of the above requested documents are appended along with the technical bid. I understand that the bid will be considered unresponsive if any of the above requested information is missing. I also understand that any bids with pricing information in the technical bid documents will be considered unresponsive.

(Signature of the Bidder)

Printed Name

Designation, Seal Date:



### Check List to Be Submitted Along with Commercial Bid

Please Attach Documents in the order given below.

S.No.	Section Title	Document Provided (Yes/No).	Document Page Number(s)
1.	Signed Check List for Commercial Bid (this page)		
2.	Commercial Bid		
3.	Costing Sheet for AMC for 2 years beyond the mandatory 3-Year warranty Period		

I hereby declare all of the above requested documents are appended along with the commercial bid. I understand that the bid will be considered unresponsive if any of the above requested information is missing.

(Signature of the Bidder)

Printed Name

Designation, Seal Date:

**Annexure-1: Details of the Bidder**

The bidder must provide the following mandatory information & attach supporting documents wherever mentioned:

**Details of the Bidder**

Sl. No	Items	Details
1.	Name of the Bidder	
2.	Nature of Bidder (Attach attested copy of Certificate of Incorporation/ Partnership Deed)	
3.	Registration No/ Trade License, (attach attested copy)	
4.	Registered Office Address	
5.	Address for communication	
6.	Contact person- Name and Designation	
7.	Telephone No	
8.	Email ID	
9.	Website	
10.	PAN No. (attach copy)	
11.	GST No. (attach copy)	

Signature of the Bidder

Name  
Designation, Seal

Date:

***Annexure-2: Declaration regarding experience***

To,  
The Convener,  
Institute NMR Facility (INF)  
Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: .....  
Dated: .....

Dear Sir,

I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company / firm has ..... years of experience in supplying and installing Helium recovery Compressor system; Helium Recovery Bag system with automatic Sensor integrated with Compressor; Helium Purifier system; Helium Liquefier system; and all accessories and components related to seamless integrated functioning of these components, such as, chillers, pumps, UPS, etc.

Yours faithfully,  
(Signature of the Bidder)

Name  
Designation, Seal

Date:

**Annexure-3: Declaration regarding track record**

To,  
The Convener,  
Institute NMR Facility (INF)  
Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: .....  
Dated: .....

Dear Sir,

I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company/ firm is not currently debarred / blacklisted by any Government / Semi Government organizations / institutions in India or abroad. I further certify that I'm competent officer in my company / firm to make this declaration.

Or

I declare the following

Sl.No	Country in which the company is Debarred /blacklisted / case is Pending	Blacklisted / debarred by Government / Semi Government/Organizations /Institutions	Reason	Since when and for how long
-------	---	--	--------	-----------------------------

(NOTE: In case the company / firm was blacklisted previously, please provide the details regarding period for which the company / firm was blacklisted and the reason/s for the same).

Yours faithfully  
(Signature of the Bidder)

Name  
Designation, Seal

Date:

**Annexure – 4: Declaration for acceptance of terms and conditions**

To,  
The Convener,  
Institute NMR Facility (INF)  
Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: .....  
Dated: .....

Dear Sir,

I've carefully gone through the Terms & Conditions as mentioned in the above referred tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I'm an authorized signatory of my company and am, therefore, competent to make this declaration.

Yours faithfully,  
(Signature of the Bidder)

Name  
Designation, Seal

Date:

**Annexure – 5: Technical compliance sheet**

To,  
The Convener,  
Institute NMR Facility (INF)  
Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: .....

Dated: .....

Dear Sir,

I've carefully gone through the technical specifications as mentioned in the above referred tender document. I declare that all these specifications are addressed, complied with and justifications and documentations are duly provided along with our bid, as per the requirements of the tender document. I further understand that non-addressal / partial compliance / faulty information on any of the specifications can lead to disqualification of our bid.

Yours faithfully,  
(Signature of the Bidder)

Name  
Designation, Seal

Date:

**Annexure – 6: Make and manufacturer details**

To,  
The Convener,  
Institute NMR Facility (INF)  
Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: .....

Dated: .....

Dear Sir,

I understand that multiple components are involved in the installation of the helium recovery, storage, and liquefaction plant. I also understand that one or many of these components are manufactured by different companies. While we will provide, install, and integrate these components together as part of the plant, I undertake to provide the accurate make and manufacturer details and all related and necessary documentation associated with each component, along with our bid.

Yours faithfully,  
(Signature of the Bidder)

Name  
Designation, Seal

Date:

***Annexure – 7: Declaration of Undertaking for Complete Installation of a functional Helium Recovery, Storage and Liquefaction Plant***

To,  
The Convener,  
Institute NMR Facility (INF)  
Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: .....

Dated: .....

Dear Sir,

I understand that several other components which are essential for installation of helium recovery, storage, and liquefaction plant are not mentioned in this tender document. I also understand that these components will be purchased by you from several other vendors. I undertake to coordinate in all aspects with all these other vendors who will be providing these other components, from time to time as the installation of the recovery, storage and liquefaction plant progresses. These components include and are not restricted to the civil constructions, recovery line installations, flow monitor installations, Quad installations, manifold installations, etc. and all and any other components and their installations.

I also undertake to realize the satisfactory and complete working of the helium recovery, storage and liquefaction plant, starting from all the points of helium evaporation to the final liquefaction.

After complete installation of the plant, I will demonstrate >95% recovery of the helium evaporating from the NMR spectrometers and all other points of helium boiloff during the period of warranty.

Yours faithfully,  
(Signature of the Bidder)

Name  
Designation, Seal

Date:



**Annexure – 8: Masked Price Bid (Note that the pricing information should be masked)**

To,  
The Convener,  
Institute NMR Facility (INF)  
Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: .....

Dated: .....

Dear Sir,

1. For each of the component systems in the specifications I undertake to tabulate the cost for every item of the component system, considering the cost in the bill of materials.
2. For any optional / alternate components suggested, the cost for these components will be tabulated individually.
3. I will clearly indicate and include any recurring costs for each of the component systems in the above bid and quantify the same. In the absence of this, the I will provide the same without any charges. No changes will be made to the amount.
4. All Deliverables will be supplied as per RFP requirements provided in the tender as well as considering the final requirements of the component systems in the integrated helium plant. I undertake to ensure the verification of these requirements accordingly.
5. I will make sure that all the arithmetical calculations are accurate. I understand that INF, IISc, will not be responsible for any incorrect calculations.
6. Our prices quoted shall be inclusive of all taxes and shipping till Bangalore.

Yours faithfully,  
(Signature of the Bidder)

Name  
Designation, Seal

Date:

***Annexure – 9: Technical specifications, Brochures and additional certifications where required***

To,  
The Convener,  
Institute NMR Facility (INF)  
Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: .....  
Dated: .....

Dear Sir,

I will provide the complete technical specifications, brochures, manuals, essential software, and any relevant additional information for all component systems in the helium recovery, storage, and liquefaction plant.

Yours faithfully,  
(Signature of the Bidder)

Name  
Designation, Seal

Date: