



INDIAN INSTITUTE OF TECHNOLOGY MADRAS
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The Manager (Project Purchase)

Date: 20.02.2023

Open Tender Reference No: **AM/SATY/03/IOE23/DRYROOMALKALI**

GEM NAR ID: GEM/GARPTS/09022023/N9K9UTKH3H87

Due Date/Time: 06.03.2023 @ 3:00 PM

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, Tenders are invited in two bid system from Class-I local suppliers and Class II local suppliers, for the supply of **“CONSTRUCTION OF DRY ROOM FOR ALKALI AND METAL ION-SULFUR and METAL ION BATTERY FABRICATION”** Conforming to the specifications given in **Annexure -A.**

Tender Documents may be downloaded from Central Public Procurement Portal <https://etenders.gov.in/e procure/app>. Aspiring Bidders who have not enrolled / registered in e-procurement should enroll / register before participating through the website <https://etenders.gov.in/e procure/app>. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at **“Help for contractors”**. [Special Instructions to the Contractors/Bidders for the e-submission of the bids online through this eProcurement Portal”]

Bidders can access tender documents on the website (For searching in the NIC site, kindly go to Tender Search option and type ‘IIT’. Thereafter, click on “GO” button to view all IIT Madras tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website <https://etenders.gov.in/e procure/app> as per the schedule attached.

1)	Pre-bid Meeting Details	:	NA
2)	ICSR Vendor Registration	:	<p><u>Vendor registration code.</u> Vendor registration with IC&SR (IITM) is mandatory for bidders to participate in tenders.</p> <p>** <u>For Vendor Registration & Guidelines, Please follow the website :</u> https://icandsr.iitm.ac.in/vendorportal; Helpdesk: vendorhelpdesk@icsrpis.iitm.ac.in</p>

No manual bids will be accepted. All tender documents including Technical and Financial bids should be submitted in the E-procurement portal.

Last date for receipt of tender	:	06.03.2023 @ 3:00 PM
Date & time of opening of tender	:	07.03.2023 @ 3:00 PM

3. Instructions to the Bidder:

<u>A)</u>	Searching for tender documents	:	<ul style="list-style-type: none"> • There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender published on the CPP Portal. • Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective “My Tender” folder. This would enable the CPP Portal to intimate the bidders through SMS / email in case there is any corrigendum issued to the tender document. • The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.
<u>B)</u>	Assistance to bidders	:	<ul style="list-style-type: none"> • Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender. • Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is [0120-4200462, 0120-4001002, 0120-4001005]
<u>C)</u>	Enrollment Process to Bidders	:	<p><u>REGISTRATION</u></p> <ul style="list-style-type: none"> • Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal URL:https://etenders.gov.in/eprocare/app by clicking on “Online Bidder Enrollment”. Enrollment on the CPP Portal is free of charge. • As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts. • Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal. • Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.) • Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse. • Bidder then may log in to the site through the secured log-in by entering their user ID / password and the password of the DSC / eToken. • Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name

			<p>is a prerequisite for registration and participating in the bid submission activities through https://etenders.gov.in/eprocure/app</p> <ul style="list-style-type: none"> • Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site https://etenders.gov.in/eprocure/app under the “Information about DSC”.
<u>D)</u>	Preparation of bids	:	<ul style="list-style-type: none"> • Bidder should take into account any corrigendum published on the tender document before submitting their bids. • Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid. • Bidder, in advance, should prepare the bid documents to be submitted as indicated in the tender document / schedule and generally shall be in PDF / XLS formats as the case may be. Bid documents may be scanned with 100 dpi with black and white option. • To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, GSTIN Details, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use “My Documents” area available to them to upload such documents. These documents may be directly submitted from the “My Documents” area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.
<u>E)</u>	Submission of bids	:	<ul style="list-style-type: none"> • Bidder should log into the site well in advance for bid submission so that he/she can upload the bid in time i.e. on or before the bid submission date and time. Bidder will be responsible for any delay due to other issues. • The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document. • Bidder has to select the bid security declaration. Otherwise, the tender will be summarily rejected. • A standard BOQ format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BOQ file, open it and complete the detail with their respective financial quotes and other details (such as name of the bidder). If the BOQ file is found to be modified by the bidder, the bid will be rejected. • The server time (which is displayed on the bidders’ dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.

		<ul style="list-style-type: none"> • The Tender Inviting Authority (TIA) will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to local issues. • The uploaded tender documents become readable only after the tender opening by the authorized bid openers. • Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details. • Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet. • More information useful for submitting online bids on the CPP Portal may be obtained at: https://etenders.gov.in/eprocure/app. • All tender documents including pre-qualification bid, Technical Bid & Financial Bid should be submitted separately in online CPP portal as per the specified format only. Right is reserved to ignore any tender which fails to comply with the above instructions. No manual bid submission will be entertained.
F)	Marking on Technical Bid	<ul style="list-style-type: none"> • The bidder eligibility criteria, technical specification and supply of item for this tender is given in Annexure A. • The Bidders shall go through the specification and submit the technical bid. • The Technical bid should be submitted in the proforma as per Annexure-B in pdf format only through online (e-tender). No manual submission of bid will be entertained. • The technical bid should have a page-wise heading as “Technical Bid” and page no. in all pages with seal and signature of authorized signatory. The total no. of pages should be mentioned at the last page of the documents. • The technical bid should consist of bidder eligibility criteria details and all technical details along with catalogue/ pamphlet which will give a detailed description of product with technical data sheet so that technical compliance can be verified.
G)	Marking on Price Bid	<ul style="list-style-type: none"> • Financial bid (BoQ) should be submitted in the prescribed proforma format as per Annexure-C in xls format through e-tender only. No manual or other form of submission of Financial Bid will not be entertained

4)	<p>Preparation of Tender: The bidders should submit the bids in two bid system as detailed below.</p> <p>Bid I _Technical Bid</p> <p>The technical bid should consist of bidder eligibility criteria and technical specification compliance sheet as per Annexure-B.</p> <p>Bid II _Price Bid</p> <p>The price bid should be submitted in excel format (BoQ) as per the proforma (Annexure C) uploaded in the e-Tender web site. The Quoted price should be for supply and installation of the item and inclusive of all cost and statutory levies at IIT Madras.</p>
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5)	<p>Price:</p> <ul style="list-style-type: none"> a) The price should be quoted only in INR net per unit (after breakup) and must include all packing, transit insurance and delivery charges to the ent of Department of Applied Engineering. b) The rate quoted shall be all inclusive of all taxes and no extra payment will be made other than statutory revisions as per the terms and conditions stipulated in this contract document. c) The percentage of tax & duties should be clearly indicated separately. IIT Madras is eligible for custom duty (5.5%). Relevant certificates will be issued wherever necessary. d) The offer/bids should be submitted through online only in two bid system i.e. Technical Bid and Financial Bid separately.
6)	<p>Tenderer shall submit along with this tender:</p> <ul style="list-style-type: none"> (i) Proof of having ISO or other equivalent certification given by appropriate authorities. (ii) Name and full address of the Banker and their swift code and PAN No. and GSTIN number. (iii) GST registration proof showing registration number, area of registration etc. (iv) All of your future correspondences including Invoices should bear the GST No. and Area Code.
7)	<p>Terms of Delivery:</p> <p>Supplier will be fully responsible for the safe carriage, Installation/Commissioning of goods up to the Department of Applied Engineering, IIT Madras or named place as per PO, Insurance coverage will be in the scope of the supplier.</p> <p>The tenderer should indicate clearly the time required for delivery of the item (subject to the approval of the Executive Committee-IIT-Madras). In case there is any deviation in the delivery schedule, liquidated damages clause will be enforced or penalty for the delayed supply period will be levied.</p> <p>In the event of delay or non-supply of materials/execution of Contract beyond the date of delivery/completion of job. The penalty will be levied @1% per week of delay subject to a max of 10% of the value of purchase order and if the delay is more than accepted time frame by IIT M, the PO would be partially or fully cancelled and liquidated damages will be enforced accordingly.</p>
8)	<p>Period for which the offer will remain open:</p> <p>The Tender shall remain open for acceptance/validity till: 120 days from the date of opening of the tender. However, the day up to which the offer is to remain open being declared closed holiday for the Indian Institute of Technology Madras, the offer shall remain open for acceptance till the next working day.</p>
9)	<p>EMD:</p> <p>The EMD of 1,80,000 to be transferred to the account details mentioned in Annexure D and proof should be enclosed in the Technical Bid. Any offer not accompanied with the EMD shall be rejected summarily as non-responsive.</p> <p>The EMD of the unsuccessful bidders shall be returned within 30 days of the end of the bid validity period. The same shall be forfeited, if the tenderers withdraw their offer after the opening during the bid validity period. The Institute shall not be liable for payment of any interest on EMD.</p> <p>EMD is exempted for Micro and Small Enterprises (MSE) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) and Startups as recognized by Department of Industrial Policy & Promotion (DIPP). (MSE/MSME/DIPP PROOF should be enclosed in the cover containing technical bid).</p>

10)	<p>Performance Security: - The successful bidder should submit Performance Security for an amount of 3% of the value of the contract/supply. The Performance Security may be furnished in the form of an Account Payee DD, FD Receipt in the name of “The Registrar, IIT Madras” from any scheduled commercial bank or Bank Guarantee from any scheduled commercial bank in India. The performance security should be furnished within 14 days from the date of the purchase order.</p> <p>Performance Security in the form of Bank Guarantee: - In case the successful bidder wishes to submit Performance Security in the form of Bank Guarantee, the Bank Guarantee should be routed directly to IIT Madras from the Bank.</p> <p>The Bank Guarantee should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including the warranty obligations.</p>
11)	For the same tender, either the OEM or the authorized dealer/service provider can only quote. But both of them cannot quote separately for the same tender.
12)	The offers/bids should be sent only for a item/Equipments of latest version that is available in the market and supplied to a number of customers. A list of customers in India with details must accompany the quotations. Quotations for a prototype machine will not be accepted
13)	Original catalogue (not any photocopy) of the quoted model duly signed by the principals must accompany the quotation in the Technical bid.
14)	Compliance or Confirmation report with reference to the specifications and other terms & conditions should also be obtained from the principal/OEM.
15)	<p>Risk Purchase Clause</p> <p>In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.</p>
16)	<p>Payment:</p> <p>(i) No Advance payment will be made. However, 90% Payment against Delivery and 10% after installation are agreed to wherever the installation is involved.</p> <p>(ii) Advance Payment: No advance payment is generally admissible. In case a specific percentage of advance payment is required, the Vendor has to submit a Bank Guarantee from a scheduled commercial bank in India equivalent to the amount of advance payment.</p>
17)	<p>On-site Installation:</p> <p>The equipment/item or Machinery has to be installed or commissioned by the successful bidder within the number of days (as prescribed by PI) from the date of receipt of the item at the site of IIT Madras.</p>
18)	<p>Warranty/Guarantee:</p> <p>The offer should clearly specify the warranty or guarantee period for the machinery/equipment. Any extended warranty offered for the same has to be mentioned separately (For more details please refer our Technical Specifications).</p> <p>** Note: PO which involves installation, warranty/guarantee shall be applicable from date of installation.</p>
19)	<p>Acceptance and Rejection:</p> <p>Failure to comply with any of the instructions stated in this document or offering unsatisfactory explanations for non-compliance will likely to lead to rejection of offers.</p> <p>I.I.T. Madras has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.</p>

20)	<p>Debarment from Bidding:</p> <p>In case of breach of Terms & Conditions, Bidder may be suspended from being eligible for bidding in any contract with the IIT Madras up to 2 Years [as per Rule 151(iii) of GFR] from the date of Tender.</p>
21)	<p>Disputes and Jurisdiction:</p> <p>Settlement of Disputes: Any dispute, controversy or claim arising out of or in connection with this PO including any question regarding its existence, validity, breach or termination, shall in the first instance be attempted to be resolved amicably by both the Parties. If attempts for such amicable resolution fails or no decision is reached within 30 days whichever is earlier, then such disputes shall be settled by arbitration in accordance with the Arbitration and Conciliation Act, 1996. Unless the Parties agree on a sole arbitrator, within 30 days from the receipt of a written request by one Party from the other Party to so agree, the arbitral panel shall comprise of three arbitrators. In that event, the supplier will nominate one arbitrator and the Project Coordinator of IITM shall nominate an arbitrator. The Dean IC&SR will nominate the Presiding Arbitrator of the arbitral tribunal. The arbitration proceeding shall be carried out in English language. The cost of arbitration and fees of the arbitrator(s) shall be shared equally by the Parties. The seat of arbitration shall be at IC&SR IIT Madras, Chennai.</p> <p>a. The Applicable Law: The Purchase Order shall be construed, interpreted and governed by the Laws of India. Court at Chennai shall have exclusive jurisdiction subject to the arbitration clause.</p> <p>b. Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Chennai in Tamil Nadu.</p>
22)	<p>Force Majeure: The Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.</p> <p>For purposes of this Clause, “Force Majeure” means an event beyond the control of the Supplier and not involving the Supplier’s fault or negligence and not foreseeable. Such events may include, but are not limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.</p> <p>If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.</p>
23)	<p>Eligibility Criteria:</p> <ul style="list-style-type: none"> ➤ As per the Government of India Order, only “Class - I Local Suppliers” and “Class - II Local Suppliers” <u>can participate in this tender.</u> ➤ <u>Bidder should confirm their acceptance that they comply with the provisions with report to “Guidelines for eligibility of a bidder from a country which shares a land border with India as detailed at Annexure-F. The bidder should submit Certificate for “Bidder from/ Not from Country sharing Land border with India & Registration of Bidder with Competent Authority” as per Order of DoE F.No.6/18/2019-PPD dated 23.07.2020 as mentioned.</u>
24)	<p>Preference to “class I Local Suppliers”: preference will be given to “class 1 local suppliers” (subject to class -I local supplier’s quoted price falling within the margin of purchase preference) as per public procurement (preference to make in India) order 2017 .O.M No P- 45021/2/2017 – pp(BE - 11) dt 04/06/2020 subject to the conditions that the “class 1 Local Supplier” should agree to supply goods / provide service at L1 rate and furnish a certificate with the technical bid document that the goods/service provided by them consists local content equal to or more than 50%.(certificate from Chartered Accountant in case value of contract exceeds Rs 10 crore).</p>

	<ul style="list-style-type: none"> ➤ ‘Class - I local supplier’ means a supplier or service provider whose goods, services or works offered for procurement consists of local content equal to or more than 50% as defined under the above said order. Declaration to be provided as per Annexure-E per item/service/work. ➤ ‘Class - II local supplier’ means a supplier or service provider whose goods, services or works offered for procurement consists of local content equal to 20% but less than 50% as defined under the above said order. Declaration to be provided as per Annexure-E per item/service/work. ➤ ‘Margin of purchase preference’: - The margin of purchase preference shall be 20%. The Definition of the margin of purchase preference is defined in the Govt. of India Order No: P-45021/12/2017-PP (BE-II) Dt.4th June, 2020) Order 2017. As per the Government of India Order – “Margin of Purchase Preference” means the maximum extent to which the price quoted by a “Class-I local supplier” may be above the L1 for the purpose of purchase preference. <p>**Note: Local content percentage to be calculated in accordance with the definition provided at clause 2 of revised public procurement preference to Make in India Policy vide GoI Order no. P-45021/2/2017-PP (B.E.-II) dated 15.06.2017 (subsequently revised vide orders dated 28.05.2018, 29.05.2019 and 04.06.2020) MOCI order No. 45021/2/2017-PP (BE II) Dt.16th September 2020 & P-45021/102/2019-BE-II-Part(1) (E-50310) Dt.4th March 2021</p>
25)	<p>Evaluation of Bids Bid evaluation will take place in two stages.</p> <p>Stage I Technical Bid evaluation All bidders who have fully complied with bidder eligibility criteria I, II and technical evaluation (Annexure A) will only be considered for opening of price bid.</p> <p>Stage II: Price Bid Evaluation The price bid evaluation will be based on price quoted by the bidder. The rate quoted for “CONSTRUCTION OF DRY ROOM FOR ALKALI METAL ION-SULFUR AND METAL ION BATTERY FABRICATION” unit will alone be taken up for arrival of Lowest Bid (L1) value.</p>
26)	<p>Selection of successful bidder and Award of Order The order will be directly awarded to the technically qualified bidder as per the condition in para 3A of DIPP, MoCI Order No. 45021/2/2017-PP (BE II) dated 16th September 2020.</p>
27)	<p>All information including selection and rejection of technical or financial bids of the prospective bidders will be communicated through e-Tender portal. In terms of Rule 173(iv) of General Financial Rule 2017, the bidder shall be at liberty to question the bidding conditions, bidding process and/or rejection of bids.</p>
28)	<p>The tenderer shall certify that the tender document submitted by him / her are of the same replica of the tender document as published by IIT Madras and no corrections, additions and alterations made to the same. If any deviation found in the same at any stage and date, the bid / contract will be rejected / terminated and actions will be initiated as per the terms and conditions of the contract.</p>
29)	<p>Due to Covid-19 pandemic pre-bid meeting will be conducted through online. Clarification to the queries and doubts raised by the bidders will be issued as a corrigendum/addendum in the e-tenders portal.</p>
30)	<p>Due to Covid-19 pandemic the bidders will not be entertained to participate in opening of Bids. Since the tender is e-tender, the opening of the bids may be checked using the respective logins of the bidders.</p>

ACKNOWLEDGEMENT

It is hereby acknowledged that I/We have gone through all the points listed under “Specification, Guidelines, Terms and Conditions” of tender document. I/We totally understand the terms and conditions and agree to abide by the same.

**SIGNATURE OF TENDERER ALONG WITH SEAL OF
THE COMPANY WITH DATE**

Bidder Eligibility Criteria and Technical Specification “CONSTRUCTION OF DRY ROOM FOR ALKALI METAL ION-SULFUR AND METAL ION BATTERY FABRICATION”

Tender No.AM/SATY/03/IOE23/DRYROOMALKALI

Bidder Eligibility Criteria – I (Public Procurement – Preference to Make in India)

Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P-45021/2/2017-PP (BE-II) dated 16th September 2020 and other subsequent orders issued therein.

CONSTRUCTION OF DRY ROOM FOR ALKALI METAL ION-SULFUR and METAL ION BATTERY FABRICATION

PRELIMINARY TECHNICAL QUALIFICATION COMPLIANCE SHEET

S.no	Particulars of item	Vendor confirmation / compliance		Complied/not complied	Refercnce pg.no
1	Minimum 4 years of experience of < 10% RH Dry Rooms in India	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
2	Test Lab to demonstrate exact job design replication/ performance in own facility or outside for witness testing	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
3	At least 2 satisfactory performance Dry Room certificates for < 10% RH Rooms supplied in India. To enclose certificates in support thereof.	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
4	Financial Soundness (of the Bidder) certificate of net worth > 1 Cr. To enclose last audited financial statement in support thereof.	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
5	The Dry Room supplier factory must be ISO 9001:2000 and ISO 14001 certified. Certificate to be enclosed.	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
6	Min 6 or more Installation of < 10% RH Dry Rooms at IIT's, CECRI,VSSC,DRDO or other authorized Government Organization or public and large organisations.	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
<10% RH Dry-room					
Dry Rooms Performance Specifications					
	· Temperature: 22 °C ± 3 °C°				
	· Relative Humidity: Less than 10% RH				
	Clean room class: Class 10000 .				
	Air Change Per Hour (ACPH) of at least 20.				

Design Loads			
	· People: 3 to 5 Nos. Maximum Personnel		
	Personnel Entry/Exits:5 times per hour		
	· Exhaust air: 30 to 50 CFM by the exhaust of Solvent Recovery System based on the number of personal.		
	· Fresh Air Supply: For Personnel and Dry Room Positive Pressure Equipment		
	· Connected Load: 10 KW plus Lights and Personnel ; Heat Dissipation to be assumed at 30% of Connected Load		
Dry Room Size & Construction			
	Dry room size	20 x 5 x 3 m	
	Air shower	1.55 m x 1 m (0.97m) x 2.3 m H in powder coated finish	
	Air Lock	3 x 3 ft with 1 nos. Doors. (900 x 2100mm)	
	Change room	6 x 4 ft with 1 nos. Doors. (900 x 2100mm)	
Specification and Requirements			
S.N O	TECHNICAL SPECIFICATION	Complied/not complied	Refercnce pg.no
1	Moisture level in Lithium-ion battery processing areas should have less than <10% RH		
2	Room temperature should be maintained at recommended levels, around 23-25C along with RH<10 %		
3	The air change rate in the production room should be 20 air changes per hour with maintenance of minimum fresh air introduction for positive room pressure and ventilation for engineers. Class 10K		
4	The max dimensions can be (20 x 5 x 3(true ceiling))M excluding the air lock & change room for effective dry room area. Also include emergency Door and standard regulatory requirements if any		
5	3 to 5 people to work inside at a time		
6	Double layer puff panels for insulation against air leakage.		
7	Max 5 door openings per hour.		
8	Dry room in ground floor and the dehumidifier can be in ground floor		
9	Installation location -Chennai		
10	Max power load inside the dry room-10KW (Average load will be less than 8KW)		
11	Materials transfer window (Three) of size at least 600mm X 600mm		
12	Anti-Static Epoxy Floor inside the dry room		
13	Air leakage		
14	Modular and detachable in case of facility need to be shifted to other location with minimum effort and cost		
SCOPE OF WORK			
Scope of work includes Detailed Design, Supply, Installation, Testing & Commissioning of 10% RH Dry Room system along with utilities to fulfill all the specification and requirement stated earlier and including the following items :			
a	Dehumidifiers		
b	DX Refrigeration Units		
c	Dry Room Enclosure with necessary Air shower, Air lock, View Windows and		

d	Air distribution system		
e	Refrigerant piping.		
f	Lighting inside dry rooms to maintain 400 Lux at work-area.		
TECHNICAL SPECIFICATIONS-I			
S.NO	Technical specification		
1	Dry Room Enclosure:		
	● Panels shall be designed with interlocking mechanism that shall essentially be Tongue & Groove joint type, & necessary vapor barrier to be provided.		
	● Panels shall be modular pre-fab sandwiched PUF panel with inside & outside 0.6 mm thick pre-painted (PPGI) sheet of shade RAL 9002.		
	● Polyurethane Foam shall be with density of minimum 40 kg/m ³ .		
	● The enclosure shall be designed for required structural strength.		
2	● Ceiling shall be supported by structure, necessary structure by vendor as part of scope.		
	Windows:		
2	● Three (3) windows of size at least 600mm X 600mm at location in each of the Dry room.		
	● Each access (Air Shower & Emergency) door will have an observation window of suitable size.		
3	Dehumidifiers		
	The dehumidifier shall be of the industrial type and manufactured to the highest consistency and reliability and ecology standards and the dehumidifier shall, therefore, be manufactured in an ISO 9001 and ISO 14001 certified manufacturing facility employing CNC sheet metal manufacturing.		
	1. The dehumidifiers shall be of the rotary type, employing the principle of chemical adsorption to remove moisture from the air on a continuous basis by use of desiccant media in rotor form.		
	2. The unit shall be minimum 50mm thick double skin recirculation type industrial dehumidifier shall be complete with reactivation fan motor unit, process fan bed drive motor, electric Reactivation, dampers, honeycomb Desiccant wheel built in controls, sensors and digital display unit all housed in a vapor tight sheet metal modular construction mounted on common frame work.		
	3. The unit shall be provided with insulated housing and heat exchanger to cool the process out let air. The control panel shall be with RH / Dew point transmitter and control the process outlet conditions as per set condition. The design parameters are presented in Design Data.		
	4. The dehumidifier framework/casing shall be made from tubular stainless steel hollow section, duly welded, and is of industrial design and robust body of industrial quality, for maximum durability, life, and strength. All sections shall be constructed using double-skinned panels with Industrial framework. The external skin shall be pre coated (PPGI) sheet of thickness 1mm and internal skin shall be of 1mm thick GI. The panels shall be minimum 50 mm thick with 48 kg/m ³ density Rockwool / Fibre glass insulation. All cold sections in the dehumidifier shall be with thermal barrier to prevent condensation.		
	5. The Dehumidifier shall have a Single Rotor Design. The dehumidifier shall consist of a high efficiency desiccant rotor/bed mounted on a horizontal fixed shaft arrangement with bypass arrangement modulating the air quantity		

	through face & bypass damper.		
	6. All sections shall incorporate access doors/panels		
	7. In order to have vapour tight construction, most of the access doors for coils/ fans/ rotor shall be bolted. The access doors requiring frequent opening e.g. Filter section shall be with quick release latches for ease of operation.		
	8. View glass shall be provided openable on all access doors, whenever moving parts are located example Fans & Rotor.		
	9. The vendor shall ensure that the total air leakage not to exceed 1 to 1.5%.The dehumidifier shall be of industrial design for maximum durability life and strength with advanced component welding and joining techniques to ensure a vapour tight (Zero vapour leakage) construction to achieve a leakage standard complying with SMACNA class 6, which allows a maximum leakage of 16cfm/100sq ft. of the casing surface at a pressure of 6" /150 mm water column gauge.		
	10. Special care shall be taken to ensure that doors, handles, hinges, etc. shall be robust enough to with stand heavy industrial usage.		
	11. Dehumidifier shall be complete with study MS painted basic frame/skid mounted so as to allow for lift during transportation and installation.		
	12. For the environmental protection, the Dehumidifier shall be placed under suitable shed/ cover / room to be provided by user as per bidder requirements .		
	13. The bidders shall describe the tests that will be conducted at their/ manufacturers' works. They shall furnish a test certificate / certificates to the effect that such tests have been duly performed.		
	<p>14 The factory tests to be conducted on the Dehumidifier shall include – the following:</p> <ul style="list-style-type: none"> I. All Functional Testing II. Performance testing of desiccant rotor for design configuration at designed velocity at proportionally reduced airflow under simulated operating controlled condition in test lab shall be shown in test facility of manufacturer. III. Leakage test per SMACNA class 6 IV. Functional test of fans and Desiccant rotor drive mechanism. V. Interlocking of control system VI. Safety checks. <p>15. However, the performance testing to be carried out at site during commissioning.</p> <p>16 The Dehumidifier shall be dispatched only after inspection and both witness tests, as detailed above, have been accepted.</p> <p>17 User shall be intimated in advance of the date of the tests, which they will witness, at their option.</p> <p>18 The dehumidifier manufacturer shall have sufficient factory trained service personnel in major metro towns to provide a quick and efficient service back up, whenever required.</p>		

4	Desiccant Wheel:		
	<p>a) The Desiccant Wheel shall transfer mainly the latent / moisture with minimal heat carryover.</p> <p>b) The rotor shall be of inorganic fiber (glass fibre) or equivalent corrosion-proof material. The desiccant media shall have in situ synthesized metal silicate desiccant on an inert inorganic fibre substrate. The net organics in the honey comb media shall not exceed 2%. The substrate of the rotor shall not made from asbestos or any other synthetic material and shall not have any toxic desiccant like Lithium chloride etc. The surface of media shall have special edge hardening so as to ensure a smooth surface and long life of both the media not seal. The desiccant media shall not use any organic burn off process as this will weaken. The media structure. The desiccant media shall have a perimeter flange which should encircle the entire perimeter so as to allow greater durability to maintain within/onto structural integrity and thermal stability due to process and reactivation airflow.</p> <p>c) The desiccant honeycomb rotor media shall be <u>adsorbent</u>, non toxic, non flammable, fully water washable .</p> <p>d) Any acidic dessicant media using acids for synthesizing the adsorbent shall not be accepted.</p> <p>e) The honeycomb rotor shall have a continuous SS perimeter flange both for providing a smooth contact for the teflon covered silicon seal, as well as strong structural integrity.</p> <p>f) The media shall be water washable.</p> <p>g) Dehumidifier rotor honeycomb media shall be PH neutral. It shall be resistant to most chemicals.</p> <p>h) The Dehumidifier rotor shall have metalwork made from SS 304 both on perimeter flange and rim.</p> <p>i) The media shall be held rigidly by a structural spoke system. The rotor below 1800mm diameter shall be for monolithic design</p> <p>j) The rotor drive must be complete with chain driven motor. The full sprocket shall be provide on the full perimeter of Rotor and shall be driven through a slip free chain mechanism, by a robust bed drive motor.</p> <p>k) The desiccant media shall not fracture due to repeated temperature and moisture cycling and on contacting water from the Pre-cool section, and all the materials of construction shall be non-toxic and non-corrosive.</p> <p>l) Seals shall be made of high temperature silicon with PTFE coated face for low friction. The seals shall be bulb type and suitable for service temperature upto 300°C seals should not be fastened, screwed or riveted, but should be of the slip on type so that seals are simple and easy to replace with no tools required. The seals shall be designed for a minimum 6” inter-compartmental pressure difference, to prevent any leakage across the seal section.</p>		

5	Dehumidifier Reactivation Energy Performance Requirements		
	<p>a) Preference will be given for complete equipment configuration with lowest energy consumption. The Battery limits for Power consumption for Reactivation heater shall not be more than 60 KW for < 10% RH Dry Room, respectively.</p> <p>b) Total KW for regeneration shall not exceed the battery limits as per above point . For every extra KW there shall be a loading on the capitalised cost @ Rs. 8 Lacs/ KW.</p>		
6	<p>Air Cooled Condensing Unit General specifications of the condensing unit and air conditioning system for controlling the temperature inside the Dry Room and for Pre-cooling the Fresh air into the Dehumidification System shall be as follows -</p> <p>a) Compressor - scroll type inverter / digital modulating for a continuous, stepless and smooth turn down capacity control</p> <p>b) Condensor fan with copper tubes and anti-corrosive coated aluminium fins</p> <p>c) Fan cycling head pressure controller</p> <p>d) Oil separator</p> <p>e) Suction accumulator</p> <p>f) Suction pressure gauge, head pressure gauge</p> <p>g) Phase loss monitor</p> <p>h) Low & High pressure switch</p> <p>i) System shall be complete with solenoid valves , regulating valves, load control mechanism, safety controls and operating controls.</p>		
7	Duct work for Supply & Return Air		
	<p>a) MS sheet fully/continuously welded duct of thickness 1.6 mm, with 50mm thick Rock wool insulation and Aluminium cladding of thickness 0.6mm, required for the air distribution system. This shall include construction, assembly & installation of the ducting system and shall conform to the SMACNA-1995 standards suitable for low RH application with necessary vertical & horizontal sealing arrangement (welding).</p>		
	<p>b) All duct work including straight sections, tapers, elbows, branches, show pieces, collars, terminal boxes and other transformation pieces must be factory-fabricated</p>		
	<p>c) All vertical & horizontal joints shall be welded to ensure 100% zero leakage.</p>		
	<p>d) Duct work shall be designed based on dehumidifier location from dry rooms.</p>		
	<p>e) The successful bidder will carry out CFD analysis of the Airflow patterns and Distribution in the Dry Room so as to verify a proper and uniform air distribution management from the supply air and return air grills/ diffusers. User may request for such a verification of the projected air distribution pattern, prior to the manufacture of the ducting.</p>		
8	HVAC Air Duct Leakage Testing		
	Scope		

	The air ducts are tested as per SMACNA Class 6 at 4 inch Pressure. It involves inserting temporary plugs in openings in a section of duct and connecting a blower and a pressure measurement system		
	Procedure		
	a) Ducts are to be tested at 100% maximum of static pressure before any duct is insulated externally.		
	b) Calculate the allowable leakage for each section using a leakage factor of 2% of Design Air Flow for that section.		
	c) Select a limited section of duct for which the estimated leakage will not exceed the capacity of the test apparatus.		
	d) Connect the blower and flow meter to the duct section and provide temporary seals at all openings in the ductwork.		
	e) Start the blower motor with the inlet damper closed. Increase pressure until the required level is reached.		
	f) Let the system run for 5-10 min to stabilize		
	g) Note the reading of differential pressure from the orifice manometer .		
	h) Calculate the actual leakage versus allowable leakage		
	i) Actual leakage should be less than or equal to calculated leakage		
	j) Read the flow meter and compare the leakage in cfm. Reading should be 2% or less of design flow for the duct section being tested.		
	k) If reading is more than <2% of design flow, depressurize duct, repair all leaks, and retest until <2% or less of design flow is obtained.		
	l) Complete test reports and obtain owner's witness signature.		
	m) Remove all temporary blanks and seals.		
9	Fire Dampers		
	a) Combined Motorized Smoke & Fire dampers with actuators carrying UL 555 Certificate for 90 minutes' fire rating and smoke leakage class I with temperature category 176 deg C.		
	b) The dampers shall be multi leaf type.		
	c) The damper shall consist of outer frame, damper blades, linkage, Electrical actuator, reversible, automatic spring return, fail safe type & extended sleeves. The blades & outer frame shall be formed out of 1.6 mm thick GSS.		
	d) All Fire dampers shall be complete with extended factory fabricated & fitted duct sleeves. The joints at the sleeve end shall be slip-on type. The minimum thickness of GSS shall be 18 G.		
10	Grills, Diffusers & Dampers:		
	a) All supply & return air diffusers shall be of Powder coated extruded aluminum sections and removable core type. Volume control dampers shall be provided for all diffusers.		
	b) Supply air grilles shall be of powder coated extruded aluminium construction. They shall be complete with Volume control dampers of aluminium mounted directly on grilles		

	c) All dampers shall be louvered dampers (of GI) of robust construction and tightly fitted in epoxy painted MS angle iron frame. They shall be provided with suitable links, levers and quadrants as required for their proper operation, control or setting in any desired position. Dampers and their operating devices shall be made robust, easily operable and accessible through suitable access doors in the ducts / false ceiling. Where required, dampers shall have an indicating device, clearly showing the damper position at all times.		
	d) Supply / Return air grilles / diffusers identification labeling to be done by the Bidder/ Vendor as per the Owner.		
11	Air Shower		
a)	Air shower shall comprise of CRCA powder coated enclosure with fan motor unit, filter, plenum for supply & return air, nozzles, door with leak tight gasket, Antiskid floor panel, service panel with electronic control system, HEPA filter, light fitting, control panel, etc.		
b)	The panel shall be of sandwich type with exterior powder finish as per the interior design.		
c)	Door shall be of leak tight epoxy powder coated with window, gasket, automatic door closer, electromagnetic lock etc.,		
d)	The fan shall be dynamically and statically balanced with 3 phase motor, dampers and anti- vibration mounting.		
e)	HEPA Filter shall be of mini pleat construction		
f)	Back-up pre filters to be provided for HEPA Filter .		
g)	Air Shower shall be adjustable cycle from 15 – 120 seconds with necessary control logic unit.		
h)	Panic Switch for emergency cut-off with hooter to be provided.		
12	Control Panel:		
a)	PLC based control panel shall be provided with touch screen facility. The touch screen shall be located outside the dry room for ease of operation & start up.		
b)	The electrical switch gear shall be from Siemens/ Schneider/ equivalent.		
c)	PLC shall be Allen Bradley / equivalent make.		
d)	An interior digital display of Dew point temperature shall be made available.		
e)	Audible and visual alarms shall be provided at the dry room.		
f)	SCADA or similar software for continuous data logging of system parameters and on line display of operating parameters. (P in, P out, R in, R out temperatures, RH / Dew point for P in and P out, relative pressure (process & react).		
g)	RS 485 communication ports		
h)	Ethernet port		
i)	Mod bus communication protocol		
j)	7 inch or appropriate size HMI color touch panel for easy operation / control.		
k)	Battery backup of settings.		
l)	Security features provided to prevent unauthorized manipulation of system		

	Parameters				
	Installation & Commissioning/ Training				
a)	Vendor has to do installation of Dry-rooms at Site . Vendor shall depute requisite manpower at premises to complete the installation / erection of Dry-rooms, ducting, dehumidifiers, condensers etc.				
b)	After completion of installation & commissioning, the vendor shall demonstrate the performance of system as per the specifications.				
c)	Vendor shall arrange to train user in operation of the Dry-room plant / equipment for necessary number of days until the user is confident and satisfied with the performance of the system (minimum 4 days) at site at vendor's cost. Later, once actual battery work is commissioned, if any issue arises, vendor should come and address it at no cost.				
	Warranty & AMC				
a)	The vendor shall provide a warranty of the dry-rooms for a period of 24 months from date of successful commissioning and 3 rd year maintenance for free				
b)	Vendor shall quote separately with this tender for AMC (Annual maintenance contract), (labour only) for a period of at least 2 years after the expiry of warranty. s				
	TECHNICAL SPECIFICATIONS COMPLIANCE				
1	The Dry rooms (<10%RH) shall include all items as mentioned and other items as may be required to complete the same to meet the design requirement . Bidder / Vendor to confirm on the same with all supporting catalogs / drawings .				
S. NO	Item Description	Qty	Remarks	Fully Complied with (Yes/No)	Refercnce pg.no
1	Dry rooms of dimensions as per data below. Drawing should be submitted along with technical bid, which need to be approved by the purchase committee before opening the financial bid.	01 No	one number for <10% RH Dry Room along with Air Locks		
2	Dehumidifiers & Air Cooled Condensers	01 set	One set for <1% RH Dry Room & one set for <10% RH Dry Room		
3	Ducting along with Grills, Diffusers, Dampers, Fire Damper, duct support etc	1 set	One set each for <10% RH dry room. Ducting to be routed from Dehumidifiers to Dry-rooms as per attached facility layout . Fire		

			Dampers in both SA & RA duly interlocked with Dehumidifier Main Panel to switch off the unit with indication .		
4	Control Panel / Display for inside conditions	01 set	One panel outside dry room and other located near Dehumidifier for <10% RH dry room.		
5	LED Lighting inside Dry-rooms.	01 lot	One lot for each Dry- room to ensure at least 400 Lux lighting throughout the room		
6	Air Shower	01 No.	For providing an effective air wash to the personnel entering the Dry Room		
7	Double Glass insulated windows	03 Nos.	3 windows in each dry-room		
8	Smoke detectors & Smoke Panel	01 sets	One set for each Dry-room . .		
9	Emergency exit door	01 No	One emergency exit door for each Dry-room as per layout enclosed		
10	Documentation for hardware and software:	01 sets	a. 'As Built' Engineering Drawings		
	a. Operating manual		b. Test Certificates for all items		
	b. Service manual		c. Operation Validation		
	c. Engineering drawings				
	d. Engineering designs				
	e. BOM				
Vendor scope of Civil work (cost may be quoted separately for this work):					

1	Vendor Should quote solution for concrete flooring at site proposed by IITM for dehumidifier and Dry Room Area. Properly prepared floor with vapour barrier including epoxy coating of sufficient thickness to ensure vapour tight envelope for the dry room			
2	Civil works like vapor proofing or painting of inside of building			
3	Shed for dehumidifier & condenser			
4	Necessary earthing and anti-static flooring			
5	Dehumidifier size based on the vendor size. Approximate Size 9M x 4M			
6	Dry Room Area 1250Sqft (24M x 5M)			
7	Main incoming power panel complete with Isolator & Circuit interrupter near the Dehumidifier main Panel, mainly for the Dry Room and related work.			
User Scope of work:				
1	Site for installing the dry room, dehumidifier and condenser			
2	Necessary permissions to carry out the work including the gate passes to vendor's personal			
Terms and conditions:				
1	Supplier should clearly mention about their service set up in India (preferably in South part of India) for prompt service support along with contact details of service engineers specially trained on the offered system. Service should be provided within 48 hrs from the report of technical problem so that machine down time is minimized.			
2	In case the Equipment / System remains non-operational for more than 5 days then warranty period will be extended for the equivalent period for which Equipment / System remained non-operational. Warranty extension in such case shall be done without prejudice to any other Term & condition of the contract.			
3	Spares: Supplier should confirm the availability of spares for next 10 years from the date of installation. All essential spares for day-to-day operation needs should be provided as standard supply.			

4	Pre-Installation Requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.			
5	Delivery Condition: The instrument should be delivered within 10-16 weeks.			
6	Vendor should provide the customer details along with the PO/installation report copy (from the last 3 years). Customer feedback will be taken into consideration before selecting L1.			

TECHNICAL BID PROFORMA
Tender No.AM/SATY/03/IOE23/DRYROOMALKALI

Item Name: “CONSTRUCTION OF DRY ROOM FOR ALKALI METAL ION-SULFUR AND METAL ION BATTERY FABRICATION”

Bidder Eligibility Criteria:

1.0	Bidder Eligibility Criteria-I (Public Procurement – Preference to Make in India)	Class I / Class II	Local Content value	Reference, Page No.
I	Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P-45021/2/2017-PP (BE II) dated 16 th September 2020 and other subsequent orders issued therein.			

2.0 Technical Compliance:

CONSTRUCTION OF DRY ROOM FOR ALKALI METAL ION-SULFUR and METAL ION BATTERY FABRICATION

PRELIMINARY TECHNICAL QUALIFICATION COMPLIANCE SHEET

S.no	Particulars of item	Vendor confirmation / compliance		Complied/not complied	Refercnce pg.no
1	Minimum 4 years of experience of < 10% RH Dry Rooms in India	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
2	Test Lab to demonstrate exact job design replication/ performance in own facility or outside for witness testing	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
3	At least 2 satisfactory performance Dry Room certificates for < 10% RH Rooms supplied in India. To enclose certificates in support thereof.	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
4	Financial Soundness (of the Bidder) certificate of net worth > 1 Cr. To enclose last audited financial statement in support thereof.	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
5	The Dry Room supplier factory must be ISO 9001:2000 and ISO 14001 certified. Certificate to be enclosed.	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
6	Min 6 or more Installation of < 10% RH Dry Rooms at IIT's, CECRI, VSSC, DRDO or other authorized Government Organization or public and large organisations.	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
<10% RH Dry-room					
Dry Rooms Performance Specifications					

	· Temperature: 22 °C ± 3 °C°		
	· Relative Humidity: Less than 10% RH		
	Clean room class: Class 10000 .		
	Air Change Per Hour (ACPH) of at least 20.		
Design Loads			
	· People: 3 to 5 Nos. Maximum Personnel		
	Personnel Entry/Exits:5 times per hour		
	· Exhaust air: 30 to 50 CFM by the exhaust of Solvent Recovery System based on the number of personal.		
	· Fresh Air Supply: For Personnel and Dry Room Positive Pressure Equipment		
	· Connected Load: 10 KW plus Lights and Personnel ; Heat Dissipation to be assumed at 30% of Connected Load		
Dry Room Size & Construction			
	Dry room size	20 x 5 x 3 m	
	Air shower	1.55 m x 1 m (0.97m) x 2.3 m H in powder coated finish	
	Air Lock	3 x 3 ft with 1 nos. Doors. (900 x 2100mm)	
	Change room	6 x 4 ft with 1 nos. Doors. (900 x 2100mm)	
Specification and Requirements			
S.N O	TECHNICAL SPECIFICATION	Complied/not complied	Refercnce pg.no
1	Moisture level in Lithium-ion battery processing areas should have less than <10% RH		
2	Room temperature should be maintained at recommended levels, around 23-25C along with RH<10 %		
3	The air change rate in the production room should be 20 air changes per hour with maintenance of minimum fresh air introduction for positive room pressure and ventilation for engineers. Class 10K		
4	The max dimensions can be (20 x 5 x 3(true ceiling))M excluding the air lock & change room for effective dry room area. Also include emergency Door and standard regulatory requirements if any		
5	3 to 5 people to work inside at a time		
6	Double layer puff panels for insulation against air leakage.		
7	Max 5 door openings per hour.		
8	Dry room in ground floor and the dehumidifier can be in ground floor		
9	Installation location -Chennai		
10	Max power load inside the dry room-10KW (Average load will be less than 8KW)		
11	Materials transfer window (Three) of size at least 600mm X 600mm		
12	Anti-Static Epoxy Floor inside the dry room		
13	Air leakage		
14	Modular and detachable in case of facility need to be shifted to other location with minimum effort and cost		
SCOPE OF WORK			
Scope of work includes Detailed Design, Supply, Installation, Testing & Commissioning of 10% RH Dry Room system along with utilities to fulfill all the specification and requirement stated earlier and including the following items :			

a	Dehumidifiers		
b	DX Refrigeration Units		
c	Dry Room Enclosure with necessary Air shower, Air lock, View Windows and		
d	Air distribution system		
e	Refrigerant piping.		
f	Lighting inside dry rooms to maintain 400 Lux at work-area.		
TECHNICAL SPECIFICATIONS-I			
S.NO	Technical specification		
1	Dry Room Enclosure:		
	● Panels shall be designed with interlocking mechanism that shall essentially be Tongue & Groove joint type, & necessary vapor barrier to be provided.		
	● Panels shall be modular pre-fab sandwiched PUF panel with inside & outside 0.6 mm thick pre-painted (PPGI) sheet of shade RAL 9002.		
	● Polyurethane Foam shall be with density of minimum 40 kg/m ³ .		
	● The enclosure shall be designed for required structural strength.		
	● Ceiling shall be supported by structure,necessary structure by vendor as part of scope.		
2	Windows:		
	● Three (3) windows of size at least 600mm X 600mm at location in each of the Dry room.		
	● Each access (Air Shower & Emergency) door will have an observation window of suitable size.		
3	Dehumidifiers		
	The dehumidifier shall be of the industrial type and manufactured to the highest consistency and reliability and ecology standards and the dehumidifier shall, therefore, be manufactured in an ISO 9001 and ISO 14001 certified manufacturing facility employing CNC sheet metal manufacturing.		
	1. The dehumidifiers shall be of the rotary type, employing the principle of chemical adsorption to remove moisture from the air on a continuous basis by use of desiccant media in rotor form.		
	2. The unit shall be minimum 50mm thick double skin recirculation type industrial dehumidifier shall be complete with reactivation fan motor unit, process fan bed drive motor, electric Reactivation , dampers, honeycomb Desiccant wheel built in controls, sensors and digital display unit all housed in a vapor tight sheet metal modular construction mounted on common frame work.		
	3. The unit shall be provided with insulated housing and heat exchanger to cool the process out let air. The control panel shall be with RH / Dew point transmitter and control the process outlet conditions as per set condition. The design parameters are presented in Design Data.		

	<p>4. The dehumidifier framework/casing shall be made from tubular stainless steel hollow section, duly welded, and is of industrial design and robust body of industrial quality, for maximum durability, life, and strength. All sections shall be constructed using double-skinned panels with Industrial framework. The external skin shall be pre coated (PPGI) sheet of thickness 1mm and internal skin shall be of 1mm thick GI. The panels shall be minimum 50 mm thick with 48 kg/m³ density Rockwool / Fibre glass insulation. All cold sections in the dehumidifier shall be with thermal barrier to prevent condensation.</p>		
	<p>5. The Dehumidifier shall have a Single Rotor Design. The dehumidifier shall consist of a high efficiency desiccant rotor/bed mounted on a horizontal fixed shaft arrangement with bypass arrangement modulating the air quantity through face & bypass damper.</p> <p>6. All sections shall incorporate access doors/panels</p>		
	<p>7. In order to have vapour tight construction, most of the access doors for coils/ fans/ rotor shall be bolted. The access doors requiring frequent opening e.g. Filter section shall be with quick release latches for ease of operation.</p>		
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	<p>10. Special care shall be taken to ensure that doors, handles, hinges, etc. shall be robust enough to with stand heavy industrial usage.</p>		
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	<p>x) Seals shall be made of high temperature silicon with PTFE coated face for low friction. The seals shall be bulb type and suitable for service temperature upto 300°C seals should not be fastened, screwed or riveted, but should be of the slip on type so that seals are simple and easy to replace with no tools required. The seals shall be designed for a minimum 6" inter-compartmental pressure difference, to prevent any leakage across the seal section.</p>		
5	Dehumidifier Reactivation Energy Performance Requirements		
	<p>c) Preference will be given for complete equipment configuration with lowest energy consumption. The Battery limits for Power consumption for Reactivation heater shall not be more than 60 KW for < 10% RH Dry Room, respectively.</p> <p>d) Total KW for regeneration shall not exceed the battery limits as per above point . For every extra KW there shall be a loading on the capitalised cost @ Rs. 8 Lacs/ KW.</p>		
6	<p>Air Cooled Condensing Unit General specifications of the condensing unit and air conditioning system for controlling the temperature inside the Dry Room and for Pre-cooling the Fresh air into the Dehumidification System shall be as follows -</p> <p>j) Compressor - scroll type inverter / digital modulating for a continuous, stepless and smooth turn down capacity control</p> <p>k) Condensor fan with copper tubes and anti-corrosive coated aluminium fins</p> <p>l) Fan cycling head pressure controller</p> <p>m) Oil separator</p> <p>n) Suction accumulator</p> <p>o) Suction pressure gauge, head pressure gauge</p> <p>p) Phase loss monitor</p> <p>q) Low & High pressure switch</p> <p>r) System shall be complete with solenoid valves , regulating valves, load control mechanism, safety controls and operating controls.</p>		
7	Duct work for Supply & Return Air		
	<p>a) MS sheet fully/continuously welded duct of thickness 1.6 mm, with 50mm thick Rock wool insulation and Aluminium cladding of thickness 0.6mm, required for the air distribution system. This shall include construction, assembly & installation of the ducting system and shall conform to the SMACNA-1995 standards suitable for low RH application with necessary vertical & horizontal sealing arrangement (welding).</p>		
	<p>b) All duct work including straight sections, tapers, elbows, branches, show pieces, collars, terminal boxes and other transformation pieces must be factory-fabricated</p>		
	<p>c) All vertical & horizontal joints shall be welded to ensure 100% zero leakage.</p>		
	<p>d) Duct work shall be designed based on dehumidifier location from dry</p>		

	rooms.		
	e)The successful bidder will carryout CFD analysis of the Airflow patterns and Distribution in the Dry Room so as to verify a proper and uniform air distribution management from the supply air and return air grills/ diffusers. User may request for such a verification of the projected air distribution pattern, prior to the manufacture of the ducting.		
8	HVAC Air Duct Leakage Testing		
	Scope		
	The air ducts are tested as per SMACNA Class 6 at 4 inch Pressure. It involves inserting temporary plugs in openings in a section of duct and connecting a blower and a pressure measurement system		
	Procedure		
	a) Ducts are to be tested at 100% maximum of static pressure before any duct is insulated externally.		
	b) Calculate the allowable leakage for each section using a leakage factor of 2% of Design Air Flow for that section.		
	c) Select a limited section of duct for which the estimated leakage will not exceed the capacity of the test apparatus.		
	d) Connect the blower and flow meter to the duct section and provide temporary seals at all openings in the ductwork.		
	e) Start the blower motor with the inlet damper closed. Increase pressure until the required level is reached.		
	f) Let the system run for 5-10 min to stabilize		
	g) Note the reading of differential pressure from the orifice manometer .		
	h) Calculate the actual leakage versus allowable leakage		
	i) Actual leakage should be less than or equal to calculated leakage		
	j) Read the flow meter and compare the leakage in cfm. Reading should be 2% or less of design flow for the duct section being tested.		
	k) If reading is more than <2% of design flow, depressurize duct, repair all leaks, and retest until <2% or less of design flow is obtained.		
	l) Complete test reports and obtain owner’s witness signature.		
	m) Remove all temporary blanks and seals.		
9	Fire Dampers		
	a) Combined Motorized Smoke & Fire dampers with actuators carrying UL 555 Certificate for 90 minutes’ fire rating and smoke leakage class I with temperature category 176 deg C.		
	b) The dampers shall be multi leaf type.		
	c) The damper shall consist of outer frame, damper blades, linkage, Electrical actuator, reversible, automatic spring return, fail safe type & extended sleeves. The blades & outer frame shall be formed out of 1.6 mm thick GSS.		
	d) All Fire dampers shall be complete with extended factory fabricated & fitted duct sleeves. The joints at the sleeve end shall be slip-on type. The minimum thickness of GSS shall be 18 G.		
10	Grills, Diffusers & Dampers:		
	a) All supply & return air diffusers shall be of Powder coated extruded aluminum sections and removable core type. Volume control dampers shall be provided for all diffusers.		

	b) Supply air grilles shall be of powder coated extruded aluminium construction. They shall be complete with Volume control dampers of aluminium mounted directly on grilles		
	c) All dampers shall be louvered dampers (of GI) of robust construction and tightly fitted in epoxy painted MS angle iron frame. They shall be provided with suitable links, levers and quadrants as required for their proper operation, control or setting in any desired position. Dampers and their operating devices shall be made robust, easily operable and accessible through suitable access doors in the ducts / false ceiling. Where required, dampers shall have an indicating device, clearly showing the damper position at all times.		
	d) Supply / Return air grilles / diffusers identification labeling to be done by the Bidder/ Vendor as per the Owner.		
11	Air Shower		
a)	Air shower shall comprise of CRCA powder coated enclosure with fan motor unit, filter, plenum for supply & return air, nozzles, door with leak tight gasket, Antiskid floor panel, service panel with electronic control system, HEPA filter, light fitting, control panel, etc.		
b)	The panel shall be of sandwich type with exterior powder finish as per the interior design.		
c)	Door shall be of leak tight epoxy powder coated with window, gasket, automatic door closer, electromagnetic lock etc.,		
d)	The fan shall be dynamically and statically balanced with 3 phase motor, dampers and anti- vibration mounting.		
e)	HEPA Filter shall be of mini pleat construction		
f)	Back-up pre filters to be provided for HEPA Filter .		
g)	Air Shower shall be adjustable cycle from 15 – 120 seconds with necessary control logic unit.		
h)	Panic Switch for emergency cut-off with hooter to be provided.		
12	Control Panel:		
a)	PLC based control panel shall be provided with touch screen facility. The touch screen shall be located outside the dry room for ease of operation & start up.		
b)	The electrical switch gear shall be from Siemens/ Schneider/ equivalent.		
c)	PLC shall be Allen Bradley / equivalent make.		
d)	An interior digital display of Dew point temperature shall be made available.		
e)	Audible and visual alarms shall be provided at the dry room.		
f)	SCADA or similar software for continuous data logging of system parameters and on line display of operating parameters. (P in, P out, R in, R out temperatures, RH / Dew point for P in and P out, relative pressure (process & react).		
g)	RS 485 communication ports		
h)	Ethernet port		

i)	Mod bus communication protocol		
j)	7 inch or appropriate size HMI color touch panel for easy operation / control.		
k)	Battery backup of settings.		
l)	Security features provided to prevent unauthorized manipulation of system Parameters		
Installation & Commissioning/ Training			
a)	Vendor has to do installation of Dry-rooms at Site . Vendor shall depute requisite manpower at premises to complete the installation / erection of Dry-rooms, ducting, dehumidifiers, condensers etc.		
b)	After completion of installation & commissioning, the vendor shall demonstrate the performance of system as per the specifications.		
c)	Vendor shall arrange to train user in operation of the Dry-room plant / equipment for necessary number of days until the user is confident and satisfied with the performance of the system (minimum 4 days) at site at vendor's cost. Later, once actual battery work is commissioned, if any issue arises, vendor should come and address it at no cost.		
Warranty & AMC			
a)	The vendor shall provide a warranty of the dry-rooms for a period of 24 months from date of successful commissioning and 3 rd year maintenance for free		
b)	Vendor shall quote separately with this tender for AMC (Annual maintenance contract), (labour only) for a period of at least 2 years after the expiry of warranty. s		

TECHNICAL SPECIFICATIONS COMPLIANCE

The Dry rooms (<10%RH) shall include all items as mentioned and other items as may be required to complete the same to meet the design requirement . Bidder / Vendor to confirm on the same with all supporting catalogs / drawings .

1

S. NO	Item Description	Qty	Remarks	Fully Complied with (Yes/No)	Refercnce pg.no
1	Dry rooms of dimensions as per data below. Drawing should be submitted along with technical bid, which need to be approved by the purchase committee before opening the financial bid.	01 No	one number for <10% RH Dry Room along with Air Locks		
2	Dehumidifiers & Air Cooled Condensers	01 set	One set for <1% RH Dry Room & one set for <10% RH Dry Room		
3	Ducting along with Grills, Diffusers, Dampers, Fire Damper, duct support etc	1 set	One set each for <10% RH dry room. Ducting to be routed from Dehumidifiers to Dry-rooms as per attached facility layout . Fire		

			Dampers in both SA & RA duly interlocked with Dehumidifier Main Panel to switch off the unit with indication .		
4	Control Panel / Display for inside conditions	01 set	One panel outside dry room and other located near Dehumidifier for <10% RH dry room.		
5	LED Lighting inside Dry-rooms.	01 lot	One lot for each Dry- room to ensure at least 400 Lux lighting throughout the room		
6	Air Shower	01 No.	For providing an effective air wash to the personnel entering the Dry Room		
7	Double Glass insulated windows	03 Nos.	3 windows in each dry-room		
8	Smoke detectors & Smoke Panel	01 sets	One set for each Dry-room . .		
9	Emergency exit door	01 No	One emergency exit door for each Dry-room as per layout enclosed		
10	Documentation for hardware and software:	01 sets	a. 'As Built' Engineering Drawings		
	a. Operating manual		b. Test Certificates for all items		
	b. Service manual		c. Operation Validation		
	c. Engineering drawings				
	d. Engineering designs				
	e. BOM				
Vendor scope of Civil work (cost may be quoted separately for this work):					

1	Vendor Should quote solution for concrete flooring at site proposed by IITM for dehumidifier and Dry Room Area. Properly prepared floor with vapour barrier including epoxy coating of sufficient thickness to ensure vapour tight envelope for the dry room			
2	Civil works like vapor proofing or painting of inside of building			
3	Shed for dehumidifier & condenser			
4	Necessary earthing and anti-static flooring			
5	Dehumidifier size based on the vendor size. Approximate Size 9M x 4M			
6	Dry Room Area 1250Sqft (24M x 5M)			
7	Main incoming power panel complete with Isolator & Circuit interrupter near the Dehumidifier main Panel, mainly for the Dry Room and related work.			
User Scope of work:				
1	Site for installing the dry room, dehumidifier and condenser			
2	Necessary permissions to carry out the work including the gate passes to vendor's personal			
Terms and conditions:				
1	Supplier should clearly mention about their service set up in India (preferably in South part of India) for prompt service support along with contact details of service engineers specially trained on the offered system. Service should be provided within 48 hrs from the report of technical problem so that machine down time is minimized.			
2	In case the Equipment / System remains non-operational for more than 5 days then warranty period will be extended for the equivalent period for which Equipment / System remained non-operational. Warranty extension in such case shall be done without prejudice to any other Term & condition of the contract.			
3	Spares: Supplier should confirm the availability of spares for next 10 years from the date of installation. All essential spares for day-to-day operation needs should be provided as standard supply.			

4	Pre-Installation Requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.			
5	Delivery Condition: The instrument should be delivered within 10-16 weeks.			
6	Vendor should provide the customer details along with the PO/installation report copy (from the last 3 years). Customer feedback will be taken into consideration before selecting L1.			

(Note: It is mandatory for the bidders to provide the compliance statement in tabular column format along with catalogue page number (comply/not comply) for the above points with document proof as required. Failing which bidders will be technically disqualified)

**SIGNATURE OF BIDDER ALONG WITH
SEAL OF THE COMPANY WITH DATE**

FINANCIAL BID (PROFORMA) - BILL OF QUANTITIES (BOQ)

Item Name: “CONSTRUCTION OF DRY ROOM FOR ALKALI METAL ION-SULFUR AND METALION BATTERY FABRICATION”

Tender No. AM/SATY/03/IOE23/DRYROOMALKALI

It. No	Description of work	Quantity	Units	Basic Rate in INR	GST in Percentage	Total Amount with taxes in INR
1	CONSTRUCTION OF DRY ROOM FOR ALKALI METAL ION-SULFUR AND METALION BATTERY FABRICATION	1	Nos.			
	Grand Total					

Total Amount Rupees in words _____



CENTRE FOR INDUSTRIAL CONSULTANCY & SPONSORED RESEARCH (IC&SR)
INDIAN INSTITUTE OF TECHNOLOGY MADRAS
CHENNAI 600 036



ELECTRONIC CLEARING SERVICE (Credit Clearing)/ REAL TIME GROSS SETTLEMENT (RTGS) FACILITY FOR RECEIVING PAYMENTS

A. Details of Account Holder

Name of the Institution	Indian Institute of Technology - Madras
Complete Contact Address	Industrial Consultancy and Sponsored Research Indian Institute of Technology-Madras, IIT- Madras Campus Post Office, Sardar Patel Road, Guindy, CHENNAI - 600 036
Telephone No./ Fax No.	Tel - 044-2257 8356
E- mail ID of the FO/AO/REG/DIR	dricrs@iitm.ac.in

B. Bank Account Details:

Institution Account Name (As per Bank Record)	The Registrar, Indian Institute of Technology - Madras
Account No.	2722101003872
Account Print Name	IIT F A/C , The Registrar IIT Madras
IFSC CODE	CNRB0002722
Bank Name (in full)	Canara Bank
Branch Name	IIT-Madras Branch
Complete Branch Address	Canara Bank, IIT-Madras Branch, IIT- Madras Campus Post Office, Sardar Patel Road, Guindy, CHENNAI - 600 036
MICR No.	600015085
Account Type	Savings Account

Certified that the Institute's account is in an RTGS enabled branch.

I hereby declare that the particulars given above are correct and complete.

Date:

Signature of the Competent Authority
of the Institution with seal.

FORMAT FOR AFFIDAVIT OF SELF-CERTIFICATION UNDER PREFERENCE TO MAKE IN INDIA – PER ITEM

Tender Reference Number:

Name of the item / Service:

Date: _____
 I/We _____ S/o, D/o, W/o, _____
 Resident of _____

Hereby solemnly affirm and declare as under:

That I will agree to abide by the terms and conditions of the Public Procurement (Preference to Make in India) Policy vide GoI Order no. P-45021/2/2017-PP (B.E.-II) dated 15.06.2017 (subsequently revised vide orders dated 28.05.2018, 29.05.2019 and 04.06.2020) MOCI order No. 45021/2/2017-PP (BE II) Dt.16th September 2020 & P- 45021/102/2019-BE-II-Part (1) (E-50310) Dt.4th March 2021 and any subsequent modifications/Amendments, if any and

That the local content for all inputs which constitute the said item/service/work has been verified by me and I am responsible for the correctness of the claims made therein.

Tick (✓) and Fill the Appropriate Category	
<input type="checkbox"/>	I/We _____ [name of the supplier] hereby confirm in respect of quoted items that Local Content is equal to or more than 50% and come under “Class-I Local Supplier” category.
<input type="checkbox"/>	I/We _____ [name of the supplier] hereby confirm in respect of quoted items that Local Content is equal to 20% but less than 50% and come under “Class-II Local Supplier” category.

- The details of the location (s) at which the local value addition is made and the proportionate value of local content in percentage

Address _____ Percentage of Local content: _____ %

For and on behalf of (Name of firm/entity)

Authorized signatory (To be duly authorized by the Board of Directors)
 <Insert Name, Designation and Contact No.>

[Note: In case of procurement for a value in excess of Rs. 10 Crores, the bidders shall provide this certificate from statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.]

This letter should be on the letterhead of the quoting firm and should be signed by a competent authority. Non-submission of this will lead to Disqualification of bids.

(To be given on the letter head of the bidder)

No. _____

Dated: _____

CERTIFICATE

(Bidders from India)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that I am not from such a country.

OR (*whichever is applicable*)

(Bidders from Country which shares a land border with India)

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and hereby certify that I from _____ (Name of Country) and has been registered with the Competent Authority. I also certify that I fulfil all the requirements in this regard and is eligible to be considered. *(Copy/ evidence of valid registration by the Competent Authority is to be attached)*

Place:

Date:

Signature of the Tenderer
Name & Address of the
Tenderer with Office Stamp