

**2021-22/04/10 - Environmental Test Chamber (Amended Specification)**

S. No.	Description	Unit	Specification
1.	Maximum dimensions of the chamber	mm	2500 x 2000 x 50 or equivalent
2.	Minimum Internal clear area dimensions of the chamber (Please specify the WxDxH based on the user requirement)	mm	2800 x 2300 x 1500 or equivalent
3.	Temperature measurement		Measurement of temperature and continuity of internal chamber through display
4.	Accuracy	°C,%	<ul style="list-style-type: none"> <li>Temperature accuracy <math>\pm 1^{\circ}\text{C}</math>, humidity chamber should be <math>\pm 3\% \text{ RH}</math> respectively.</li> </ul>
			<ul style="list-style-type: none"> <li>A durable and rugged temperature &amp; humidity sensor should be integrated with the unit.</li> </ul>
<b>5. Details of Test Chamber</b>			
	<b>a. Material:</b>		Stainless steel grade suitable for the requirement, and provide the protection from corrosion.
	<b>b. Dimensions :</b>	mm	Equivalent External dimensions of the chamber will be as per the manufacturer design, however the information on external dimensions and required clearance are to be supplied by the manufacturer/supplier at the time of quotation
	<b>c. Exterior Material:</b>		I. Double coated galvanized steel sheet or equivalent suitable for corrosion resistance in tropical climates.
			II. The exterior finish should be Single or two-coloured, powder coated (Manufacturer/Supplier to indicate)
	<b>d. Door:</b>		I. Preferred hinged on left, with latching arrangement along with excellent seal to stop thermal or conditioned air leakage.
			II. The hinge should be capable to withstand the 50,000 operations without fail.
<b>6. Equipment</b>			
	<b>a. Viewing window:</b>		The front door should have viewing window with suitable arrangement so as to facilitate visual check on specimen and sensor leads during the test.
	<b>b. Refrigeration unit:</b>		Water cooled refrigeration system to ensure long and continuous operation say up to 100 days at a single stretch. <ul style="list-style-type: none"> <li>➤ The compressor shall be mounted on anti-vibration pads</li> </ul>
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	<b>c. Heating System:</b>		<ul style="list-style-type: none"> <li>➤ Stainless Steel sheathed air heaters to achieve the desired set temperature.</li> </ul>

			<p>➤ The heaters shall be placed in the conditioning plenum such that there is no direct radiation from the heaters onto the test specimen.</p> <p>➤ Heater outputs shall be controlled for superior stability and control in temperature.</p>
	<b>d. Control:</b>		Digital Measuring and control system and a PC through RS-232 /USB connection.
	<b>e. Interface:</b>		Serial interface RS 232/USB for connection to PC for bi directional communication
	<b>f. High/Low temperature safety device:</b>		Pl. specify as per relevant European Standard)
	<b>g. Air flow:</b>		The air circulation within the chamber shall be as close to laminar ensuring uniform airflow across the whole workspace
	<b>h. Interior Illumination:</b>		Interior illumination with lamp and the switch to be located outside.
	<b>i. Humidification system:</b>		Preferred with steam humidifier
<b>7.</b>	<b>Chamber Performance</b>		
	a. Maximum temperature	°C	+120 or equivalent
	b. Minimum temperature	°C	-60 or equivalent
	c. Temperature deviation in time	°C	± 1 or equivalent
	d. Spatial temperature variation over the module area:	°C	±2 or equivalent
	e. Temperature change rate:		The rate of change of temperature should be up to 200°C/hour under full load conditions
	f. Humidity Stability	%	3 % RH or better
<b>8.</b>	<b>Control and Programming</b>		
	a. Colour touch panel:		VGA graphic, background-lighted LCD display language English
	b. Program Memory		100 Programs
	c. Password protection:		two levels, to prevent accidental setting
	d. Limit value monitoring system:		for temperature and humidity to be provided
	e. Diagnostic system:		for information on operating times and possible operating failure.
	f. Serial interface		RS 232/USB for bidirectional connection to a computer system for networking
	g. Graphical check of the program:		The temperature/humidity cycle programming Should be displayed on the panel for immediate visual check

	h. Printing and storage of Program:		Should be stored/printed in graphical form as well as in tabular form.
	i. Control System		There should be provision for auto resume for test profile during power interruption.
			There should be provision for entering program ramp steps in time or °C
1.	<b>Connections/Others</b>		
	a. Power supply		3/N/PE/AC 415 ± 15%, Volts 50 HZ or 230 ± 5% Volts 50Hz or as suitable
	b. Grounding Requirement:		Supplier to specify in detail.
	c. Protection types		Test cabinet IP 22, Electrical/ Operating panel IP 54 (or any relevant International Standard)
	d. Maximum connected load:		Supplier to specify with details for load requirement sub-system wise
	e. Maximum current consumption:		Suppliers to please specify
	f. Cooling water requirement:	°C	Supplier to specify quantity of water inlet at 35°C input water. Also specify pressure at inlet.
	g. Humidification water : reservoir).		Fully de-mineral (conductivity max. 20 µS/cm, Ph value 6-7) Automatic supply from integrated RO system (to be supplied with the chamber along with constant level
	h. Condensation drain:		If required, please specify quantity and grade
	i. Compressed air supply on site:		please provide the details
	j. Weight of chamber:		Supplier to please specify
<b>Note 1</b>	The admissible ambient temperature range for satisfactory operation of the chamber should be from	°C	10 ± 2 to 45 ± 2
<b>Note 2</b>	Manufacturer should ensure that the system is designed for ease of maintenance. For example, the motors used for air circulating should be easily accessible for demounting and re-fixing as and when required.		Supplier to please specify
<b>Note 3</b>	Warranty		Minimum <b>3 Years</b> warranty must be provided
<b>Note 4</b>	Installation and Commissioning		I. The Supplier shall be responsible for carrying out the Installation and Commissioning at customer site. II. Complete training should be provided at the site.

<b>Note 5</b>	Terms & Conditions	III. Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution.
		IV. A Satisfactory Performance certificate from two institutions to be provided for eligibility. Bidder should submit complete contact details.