

Technical Specification for a Cryoprobe for electrical and optical measurements with high-temperature heating

The cryoprobe operable from -195 °C to temperature as high as 350 °C should have a design to measure optical properties and electrical properties. Detailed specification of the cryoprobe is listed below.

1.

S.No	Bidder Eligibility Criteria-II	Compliance (Yes/No)	Reference Page No.
1)	<p>The bidder/OEM should have supplied at least 5 similar items to IITs, NITs, IISERs, CSIR Labs or other Govt. R&D organizations in the last 5 years, The supplier should provide Performance certificate(s) along with contact details (address, email id, phone number) of all these users so that IIT Madras can approach them for any feedback.</p> <p>In case of any doubt about the capability of the machine, the vendor will have to arrange a demonstration at any site, bearing the cost including the travel and other expenses of the IIT Madras representative.</p>		

2.

S.No	Specifications	Description	Complied/Not Complied	Reference Page No.
1.	Temperature Range	-195 °C to 350 °C or higher		
2.	Temperature Stability / Accuracy	At least 0.1°C or better		
3.	Cooling rate	Variable cooling rate should be possible (up to 100 °C/min)		
4.	Cooling Method	Liquid N ₂ based system should be quoted for low temperature (<0 °C)		
5.	Vacuum compatibility	10 ⁻³ mbar with suitable O-ring sealing		
6.	Vacuum port	KF type attached to the chamber		
7.	Sample Area	At least 2 cm dia or larger		
8.	Gas flow	Chamber should be compatible with flow/filling up of non-corrosive gas		
9.	Heating/cooling block	Metal made (preferably silver)		
10.	Heating stage	Heating stage with 20 mm diameter or larger with high thermal conductivity should be provided		

11.	Heating control	Software based control and controller interface to be included		
12.	Heating Rate	0.01°C to 150 °C per minute		
13.	Temperature Sensor	Platinum resistance type sensor (100 ohm) or any other suitable sensor (should indicate the sensor type)		
14.	Calibration Points	2 or more Calibration points to check accuracy of Pt resistance sensor		
15.	Optical Window	The temperature stage should be operable with both transmitted and reflected light. Quartz window of 20 mm × 0.5 mm for light illumination on sample from top should be provided. An aperture hole of at least 2 mm dia in the stage should be provided for transmission measurements.		
16.	Electrical Probes	4 electrical probes with gold coated Tungsten probe tips mounted on manipulators / positioners with flexibility to place on any X-Y point on the sample stage with a screw type adjustment		
17.	Electrical shielding /noise protection	The thermal- probe stage chamber should have metal (steel /aluminium) body to minimize external electrical noise		
18.	Electrical connection	4 BNC connectors fitted outside for taking connections with the probes		
19.	Chamber lid	Should be easy to close/open from the top side		
20.	Current and voltage for probes	Maximum voltage: 300 V AC Maximum ampere: 4 A		
21.	Response time for data transfer	<1 second at 5°C/min at 50°C		
22.	Temperature profile	100 Ramp temperature profile programming		
23.	Gas valves	Quick-release gas valves for atmospheric control		
24.	Water circulator system	To keep the stage body and quartz windows cool during heating		
	Optional items			
25.	Vacuum pump	A suitable vacuum pump and other related accessory should be quoted		
26.	Chamber Pressure monitor	A vacuum gauge along with appropriate mounting (preferably KF type port) should be provided		

27.	Warranty and maintenance	<p>The complete instrument should be under warranty for a period of at least two years from the date of installation. The vendor should be agreeable to entering into a Comprehensive Annual Maintenance Contract with IIT Madras at a reasonable price, for maintaining the equipment in proper working condition, after the warranty period is completed (optional item). A Quote for the cost of onsite annual maintenance for two years after the warranty period should be provided.</p> <p>The vendor must have a service centre in India. In case of breakdown during the warranty period, competent service engineer of the supplier should make as many visits as are necessary to rectify the problem and replace the faulty parts, without any liability of cost. All the expenses related to shipping of faulty parts should be borne by the vendor. The supplier should ensure the supply of all spares required for making the instrument operational. Spares recommended for keeping in inventory along with the instrument may also be quoted as an optional item.</p>		
28.	Installation and training	<p>The complete system should be installed at the user defined site at IIT Madras. The supplier should also provide complete hands-on training after installation and commissioning. Complete installation should be done by the supplier at IIT Madras, and the expense associated with installation and training should be included in the quoted price.</p>		
29.	Service:	<p>The support of local service team together with online technical support should be available. Basic spares should be available with the local vendor.</p>		
30.	Compliance Statement	<p>The supplier must submit technical brochures and proper application notes adequately explaining and confirming the availability of features in the model of the equipment being quoted for. The offered specifications should accompany all Makes & Model Nos.</p> <p>The supplier must submit a table indicating</p>		

		the compliance of the features of the model being quoted for with those given in the indent. Features not matching – must be clearly indicated and all deviations must be clearly specified. Additional features and features in the quoted equipment which are better than those in the indent – may be explicitly highlighted and explained.		
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