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Tender ID :	2025_CSIR_239347_1
Tender Ref No :	CIMFR/PUR-14(18)2021
Tender Title :	Supply and Installation of Surface Area Analyser (BET)
Corrigendum Type :	BOQ

Corrigendum Document and BOQ List

Corr.No.	Corrigendum Title	Corrigendum Description	Published Date	Document Name	Doc Size(in KB)
1	Revised BoQ After Pre-Bid Meeting	Revised BoQ After Pre-Bid Meeting for Supply and Installation of Surface Area Analyser (BET).	14-Jul-2025 06:07 PM	BoQr.pdf	437.76
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Corrigendum Document Details

Corr.No.	Corrigendum Title	Corrigendum Description	Published Date	Document Name	Doc Size(in KB)
1	Revised Specification After Pre-Bid Meeting	Revised Specification After Pre-Bid Meeting for Supply and Installation of Surface Area Analyser (BET).	14-Jul-2025 05:39 PM	RevisedBET.pdf	995.23

Revised Technical Specification after Pre-Bid Meeting dated 09.07.2025

Technical Specifications for Surface Area Analyser Instrument

The Surface Area Analyser of high resolution with automatic gas adsorption is to determine surface area, as well as facility to measure pore size distribution in the range of micro, meso and macro pores (IUPAC) and pore volume. The system should have following specifications:

Sl. No	Specification	
1.	Analyzer	The system should be automatic and capable of carrying out physisorption of various gases and features to measure the adsorption/desorption isotherms, surface area, pore volume, pore size distribution of solids, powder and particles.
2.	Measurement Principle	Volumetric gas adsorption technique
3.	Analysis Ability	Surface Area by single and multi-point, BET specific surface area, Langmuir specific surface area, Pore size distribution, DFT, BJH, DH, DR, DA, t-plot etc. for micropore, mesopore & macrospore analysis (IUPAC nomenclature.)
4.	No. of sample analysis ports	• System should be equipped with minimum 2 analysis ports Each port should have pressure sensors enabling up to minimum 2 simultaneous sample measurements.
5.	Analysis Gases	The system should be in a position to utilize wide variety of adsorptive gases like Nitrogen, Argon, Hydrogen, Oxygen, CO_2 (O ^{o}C), Krypton, Xenon, etc.
6.	CO_2 based surface area analysis	A dedicated recirculatory Dewar and chiller unit for sample analysis with CO_2 at 0 ^{0}C and room temperature.
7.	Measurement specification	• Surface Area Range: 0.01 m^2/g or lower to 'No known upper limit' • Pore Diameter Range between 0.35 nm to macro size • Relative pressure range: Maximum P/Po using nitrogen: 0.997 or better • Micropore Volume: minimum detectable 0.0001 cc/gm
8.	Pressure Transducers	• Adsorption and desorption isotherms measured using 1000, 10, 0.1 torr pressure transducers.

		• Minimum two analysis port should be equipped with 1000, 10, 0.1 torr pressure transducers i.e micropore capability
9.	Saturation vapour pressure	A dedicated port with pressure sensor to measure saturation vapour pressure, this port should be in addition to the sample ports.
10.	Dead volume correction	The system should have facility to take care of dead volume issue either by correction method or by suitable method to maintain the liquid nitrogen level.
11.	Sample Preparation	• The offer should include suitable sample preparation device with a facility to use heat up to a temperature of 350 °C or above in flow or vacuum condition. • The unit should have facility to do simultaneous sample preparation of minimum 2 samples with inert gas flow/vacuum arrangement.
12.	Degassing System	• The instrument should have minimum two degassing ports. • The instrument should have vacuum pump for degassing purpose. • The vacuum system should be capable of degassing the samples up to a vacuum level of 1×10^{-6} Torr (for integrated degassing unit)/ 1×10^{-3} Torr (for separate degassing unit)/ or lower or as per requirement of the instrument
13.	Cryogenic System	• Minimum two Dewar flasks (Volume: 3 litre or more) for holding liquid at cryogenic temperature (such as liquid nitrogen) • Dewar Volume: Suitable to hold minimum 2 sample tubes for simultaneous analysis at a time with minimum Dewar duration 70 hours. • It should be supplied with 3 pairs of hand gloves, 3 safety goggles and 3 aprons for handling liquid nitrogen and SA analysis
14.	Software Features	• The software should be Original licensed version from OEM.

		• Suitable software and other interfacing & integration for carrying out the measurement and analysis with high levels of reliability and accuracy. • Software should be capable of performing the following tasks: Generate both 'Single- and Multi- point BET specific surface area' Generate all the measured 'Adsorption and Desorption Isotherms' Langmuir surface area with slope, intercept, constant and correlation co-efficient Pore Size distribution, Pore area and Pore volume by BJH, DFT, DR, DA and other models T-plot for micropore area & volume (internal and external) • The software should have the data handling features like user defined report generation, data/ figures export to spread sheets (ASCII files import/ export, word/ excel compatibility, pdf formats) and offline data processing etc.
15.	Essential Accessories	• Minimum 20 set of Samples cells/tubes of suitable volume with suitable glass rods and filters, O-rings and other required fittings and consumables for installation and operation should be supplied. • P_0 cell minimum 2 additional should be provided. • Float cell -2 additional should be provided if required. • Separate standard reference material for microporous and mesoporous respectively with NIST traceable certificate should be supplied for validation (Minimum amount: 5-10g). • One set of operation manual and service manual (both hard and soft copy in English) should be supplied with the equipment. • Firm should provide make, model and catalogue of all the accessories.

		• Instrument should be factory calibrated. All the necessary certificates including latest calibration, inspection and test report of the concerned components must be provided during the supply of the instrument.
16.	Liquid Nitrogen container	10L and 50L Liquid nitrogen container with liquid nitrogen and dispensing/transfer arrangement (for 50L Liquid nitrogen container) should be supplied.
17.	Digital weighing balance	One Digital weighing balance for accurate and precise weight measurement with following minimum specifications: • Readability: 0.01mg or lower • Max. Weighing capacity: up to 100g with tare and in-built auto calibration facility. Make: Reputed manufacturer preferably from Mettler Toledo/ Sartorius/KERN
18.	Computer and Printer	• Branded Latest model (Dell/HP/Lenovo/Acer) computer with CPU, Processor i-7, RAM 16 GB, SSD-1 TB minimum 24-inch full HD LED display (resolution 1920x1200 pixels or better), licensed in-built windows latest version (Windows 11 or better) compatible with machine and software with preloaded licensed with latest MS-Office Professional software, optical mouse & wireless keyboard, • Colour Laser Printer: Latest model (Make: Canon/HP/Ricoh or equivalent).
19.	Gas cylinders	• Filled carbon steel cylinder (47 Lit. appx Water capacity, inlet pressure 140-160 kg/cm^2 for He, N_2 and Ar; (60 kg/cm^2 for CO_2) of Helium, Nitrogen, CO_2, Argon (each gas purity: Ultrapure 99.999%). • All cylinders should be provided with safety and refilling certificate. Double stage gas regulators (SS 316 diaphragm) of reputed brand for Helium, Nitrogen, CO2, Argon with compatible inlet pressure with the cylinders and outlet pressure range: 0-10 Kg/cm2 to be connected with above mentioned gas

		cylinders with proper tubing (min 10 m for each) and connecting arrangement between cylinders and with required safety and product quality certificate, Cylinders and regulators: One number each as above-mentioned
20.	Training	The manufacturer / supplier of instrument should provide 3 days onsite training in both hardware and software to the laboratory personnel in the installation, operation and maintenance of the instruments.
21.	Warranty CMC and AMC	**Warranty:** Complete instrument will be under standard onsite three years warranty (consider for evaluation of LQ1 firm). After completion of three years standard warranty, 3 years AMC should be quoted and it will be freezed at the time of issue of purchase order and not consider for evaluation of LQ1 firm. During warranty period, the successful bidder has to make two preventive maintenance visits on six monthly basis and breakdown as and when required. The standard onsite warranty period will commence after successful commissioning and installation and certification in this regard by user scientist.

22. Deliver Schedule

Schedule	Purchaser's time frame	Reference
Expected delivery period	4 months	From the date of purchase order/LC opening
Expected installation & commissioning period	1 month	From the date of delivery in CIMFR, DC store
Expected Period of Demo/ Trial run	1 week	From the date of Installation /commissioning
Expected period of observation	1 week	From the date of Installation
Expected date of training	1 week	From the date of Installation

Delivery site		CSIR-CIMFR, Digwadih Campus, Dhanbad, Jharkhand

Note: LQ1 firm will be decided on the basis of equipment prices, accessories and 3 years warranty.