**Date: 06/10/2025**

**CORRIGENDUM /ADDENDUM – 01**

1. It is notified to all concerned parties that with reference to our **Tender No. IITH/CLEANZ/DSHEE/2025/O/T026G** dated: **24/09/2025** the following changes are being made (highlighted in yellow color) w.r.t. the Tender: -

## Tender Specification of Elemental Analyzer (CHNS-O)

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| **General requirements** | : | A fully automated elemental analyzer with thermal conductivity detector (TCD) is required for the determination of elemental composition (C, H, N, S, and O) of varying heterogeneous solid and liquid organic materials such as coal, coke, biomass, carbon materials, soil, waste, hydrocarbon fuels, petroleum products, pharmaceuticals, plastic, polymers, catalysts, chemicals etc. |
| **General Features** | : | The offered elemental analyzer should have following features.<br>• The design of the elemental analyzer should be compact benchtop<br>• The elemental analyzer can be fully controlled by supplied software and computer.<br>• The analyzer should be capable of determining of C, H, N, S and O in various heterogonous Solid and Liquid samples.<br>• The system should be able to detect all the elements without the need of additional module and utilizing dual reactors<br>• All the elements should be detected with high precision even with low quantity of sample.<br>• The system should provide highly reliable results for all types of samples.<br>• The system should ensure low-cost analysis<br>• The system should be highly flexible for using different carrier gas (He/Ar) without changing the hardware.<br>• The offered system should be upgradable for any future need. |
| **Operating mode** | : | CHNS, CNS, CHN, CN, N, S, O |
| **Analysis and Gas separation methods** | : | 1. High temperature combustion or pyrolysis of the sample and conversion of the elements into gaseous products<br>2. Advanced Chromatographic separation of gases |

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| | | 3. Complete instrument control over elution process with provision of auto zero of baseline after each element elution<br>4. Full separation of all analytes and, no peak tailing or peak overlap<br>5. Full Base line separation of 1:12,000 for N:C and S:C |
| **Sample weight** | : | 0.1 to 1000 mg or higher |
| **Detection range** | : | 0 to 100% for all elements with the capability of measuring<br>1. 0.1 to 10 mg (or higher) for measurement of absolute Carbon and absolute Nitrogen in CHNS mode. Typical 15 mg or higher coal and coke sample can be analysed<br>2. 0.1 to 50 mg (or higher) for measurement of absolute Carbon in CN mode and<br>3. 0.1 to 6 mg (or higher) for measurement of absolute Oxygen in Oxygen mode |
| **Measuring range** | : | 0.005% to 100% for all elements |
| **Analysis time** | : | <10 minutes in CHNS mode of operation and self-optimizing depending on element content and sample weight. |
| **Standard deviation** | : | ≤0.1% of absolute |
| **Carrier gas** | : | Helium |
| **Furnace** | : | 1. Controlled furnace Temperature should be 1200°C or more<br>2. Two zone or dual furnace system<br>3. Dedicated combustion and a separate reduction system with independent temperature control for each furnace/zone in CHNS mode<br>4. Possibility to set different temperature for combustion and reduction<br>5. Possibility to use ceramic/quartz ash finger to handle high halogen or fluorine content sample<br>6. Easy ash removal facility and warning notification |
| **Combustion/reduction/Oxygen reactors** | : | Quartz tube long life design with separated combustion, reduction, Oxygen analysis tubes |
| **Detector** | : | 1. Highly sensitive, Oxygen intrusion free, Thermistor Technology based Temperature stabilised Thermal Conductivity Detector (TCD) Detector<br>2. Alternative detector for measurement of ultra-low concentration of C-H-N-S & O as an optional item and can be quoted with full specifications. |
| **Autosampler** | : | 1. Electrical/electronically and fully software control operation<br>2. Minimum of 80 positions or more |

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| | | 3. Zero blank sample injection system without keeping the whole autosampler under inert atmosphere for saving expensive inert gas.<br>4. Non-requirement of Helium for flushing the auto sampler saving expensive gas. |
| **Flow control and measurement device** | : | Electronic mass flow controller and Digital flow sensors for accurate readout of flow |
| **Calibration** | : | The offered system should have multipoint, multirange, matrix-independent calibration facility |
| **Accessories** | : | Microbalance: Microbalance (Mettler/Sartorius make) should have a readability of 0.001 mg or better.<br>It should be interfaced with analyser to enable for direct transmission of weighing data.<br><br>2.Suitable and compatible kit for the measurement of fluorinated samples<br>3.UHP grade Helium gas cylinder of 47 litre capacity with double stage SS regulator and gas purification panel<br>4.UHP grade Oxygen gas cylinder of 47 litre capacity with double stage SS regulator and gas purification panel |
| **Software** | : | 1. Facility to monitor segmented leak to enable identification of exact position of leaks.<br>2. Should be licensed and Windows based and compatible with the recent version i.e., Windows 11 or latest<br>3. Should have display of set and actual pressures, flow rates, temperatures, number of samples analysed with provision for setting maintenance interval and warning when maintenance needed, statistical evaluation, error diagnosis etc. |
| **Computer and Online UPS** | : | • Desktop version<br>• Minimum of 21” FHD monitor or better<br>• Latest generation intel i5 or higher processor<br>• 16GB RAM or higher and 1TB SSD<br>• Licensed Windows 11 OS, 21” monitor, Keyboard and mouse.<br>• A multifunctional laser printer should be included with the offer.<br>• Appropriate capacity of online UPS with 60 min power backup should be included in the offer. |
| **Maintenance Kit** | : | All necessary spares, consumables, tool kit etc. required for the hassle-free operation and maintenance of the instrument should be included with the offer. |

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| **Consumables** | : | To be supplied with consumables enough for<br>1. 5,000 sample analyses in CHNS mode (4000 Solid and 1000 liquid sample analysis, including all necessary consumables (chemicals, sample containers, reaction tubes etc.) respectively).<br>2. 1,000 sample analyses in O mode including all necessary consumables (chemicals, sample containers, reaction tubes etc).<br>3. Calibration standards: Enough quantity of appropriate certified standards (e.g. Sulphanilic acid, BBOT, Acetanilide, EDTA, Acetonitrile, DMSO, iso-octane etc.) for all elements (C,H,N,S, O) should be included with the offer. |
| **Accessories for sample preparation** | : | Necessary tools and accessories with required consumables for solid and liquid sample preparation and loading should be included with the offer. |
| **Warranty** | : | • A comprehensive warranty of 5 years from the date of installation for the whole instrument and accessories should be included with the offer.<br>• 10-year free replacement warranty for the furnace.<br>• 10 years warranty on TCD or other alternative detectors. |
| **Terms and conditions** | : | **Availability of Spares:** The supplier must ensure the availability of essential spares for next 10 years.<br>**One-time free shipment and installation to a new location within IITH premises**<br>**Installation and training:**<br>The supplier must provide installation, commission, and multiple training sessions (first training session during installation, and second training session any time after six months and third training session after one year from the date of installation) of minimum 3 days or more each for group of users from operating the all instruments to complete analysis, general maintenance at site without any additional cost with supply of all the relevant manuals and documents in printed format and electronic version as well.<br>**List of Users, Purchase order and performance certificate:**<br>The supplier must produce detailed lists with contact details of Indian users including Central Govt Universities, Govt Research Organization/Institutes, NITs and IITs/IISC/IISER etc. with the technical bid.<br>The supplier should submit relevant documents as proof (e.g., Purchase Order with price informations) |

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| | | that they have supplied at least 5 systems in the last 3 years in India. The performance certificate from Indian users (at least 3) should be attached along with the technical bid.<br>**Services:**<br>The supplier must demonstrate that they have appropriate set-up and capability to provide after-sales service effectively in India for prompt service support along with number of service engineers specially trained on the offered system. The supplier should ensure that service engineer will be available to attain the service call within 48 hrs of intimation to avoid longer downtime of the instrument.<br>**Pre-Installation requirements:**<br>Necessary pre-installation advice and site preparation requirements should be sent along with the technical bid. Any furniture's and specific power connection required for above offered instrument should be included in the offer. |

2. All other terms and conditions of the tender remain unchanged. Bidders, who have already submitted their bids prior to issue of this corrigendum need to submit again.