

**Office of the Central Purchase unit
National Institute of Technology Srinagar.**

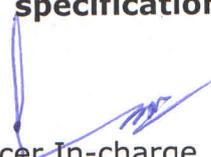
E-TENDER NOTICE (CORRIGENDUM)

Tender document No.

**NITS/CPU/ET/2019/CRFC/006 dated 23.11.2019 for
supply of Wavelength Dispersive X-ray Fluorescence for Central
Research Facility Centre.**

S.No	Description of item	Bid security	Last date & time for purchase of bid document online	Last date & time for online submission of bids	Date & time for opening of Technical bids
1	Supply of Lab equipment for CRFC (Wavelength Dispersive X-ray Fluorescence.)	3,00,000/=	03.01.2020 16.00 hrs	06.01.2020 13.00 hrs	06.01.2020 at 15.00 hrs.

As per discussions held during pre-bid conference, the revised specifications of mentioned equipment is attached.


Officer In-charge
Central Purchase Unit

No. NITS/CPU/19/5346
Dated 27.12.2019

Description of items	Specifications
<p>Wavelength Dispersive X-Ray Fluorescence Spectrometer with Accessories</p>	<p><u>Detailed Technical Specifications</u></p> <p>1. General Description</p> <p>a) The XRF manufacturer should be internationally reputed and the instrument shall be fully automated, compact; computer controlled Sequential Wavelength Dispersive X-Ray Fluorescent Spectrometer capable of analyzing elements from Be to U in the concentration ranges from ppm to 100% in pallet and fused bead form with high speed and high precision. The system shall be capable of analyzing major, minor and trace elements in Cement and its raw materials glass, rocks, Ferrous and Non-Ferrous metals and their alloys along with liquid samples. The system shall be capable of analyzing major (Si, Ti, Al, Fe, Ca, Mg, Na, K), minor (S, P, Mn, Cr) and trace elements (V, Co, Ni, Cu, Pb, Zn, Sc, Rb, Ga, Sr, Nb, Zr, Y, Ba, Th etc.) . The system should also have provision for analyzing loose powder and liquid samples. The quoted model must be available currently for sale worldwide.</p> <p>In addition to bulk sample analysis (20 to 25 gm), there should be a provision for the analysis of samples at small scale (20 to 25 mg). e.g. characterization of nanomaterials at milligram (mg) scale.</p> <p>Micro Area Mapping: For characterization of samples at small scale</p> <p>Applications: Analysis of metals, semiconductors, cement, oil, polymer, plastic, natural and synthetic solids in powdered form, food industries along with mining, mineralogy, geology and environmental analysis of water and waste materials.</p> <p>b) The instrument shall be floor mounted with single/dual cabinet including the control electronics and shall have auto sample changer. All kinds of safety protection for radiation, electrical and electronics should be in built as per International regulations/norms. All these norms should be clearly specified in the offer.</p> <p>c) The instrument shall be cooled by an external chiller.</p> <p>d) The instrument model should be latest & should be available worldwide.</p> <p>e) The quoted model must have type approval certificate from Atomic Energy Regulatory Board (AERB).</p> <p>2. Sample Handling and Presentation</p> <p>The sample presentation system shall be capable of handling solids, liquids, pressed powders, loose powders and fused beads (40 mm dia.) in a variety of sample holders. Along with 40 mm dia sample holder the sample holders with 5, 10, 20 and 30 mm dia should also be provided with the instrument.</p> <p>The sample surface should face downwards during analysis facilitating loose powder and liquid analysis.</p> <p>Spectrometer shall have facility for automatic sample type recognition. An automatic sample changer with capacity of handling at least 40 or more samples at a time.</p>

Vacuum Chamber Volume must be lowest with minimum number of vacuum joints and should have air locked device controlled by single built-in vacuum pump.

3. Dust Collection System: To protect the x-ray tube and other accessories inside goniometer from sample particles the spectrometer shall be equipped with built in dust collection system. It should be user accessible for cleaning. The X-ray tube must be equipped with suitable protection against dust. The system shall also be equipped with mandatory spectrometer protection mechanism against spillage of liquid during measurement. Vendor has to clearly explain these protection features in their quotation. Protection of the X-ray tube and spectrometer chamber housing the optical components is a mandatory safety feature of the equipment.

4.X-Ray Generator & X-Ray Tube

X-ray Generator shall have rating 4 kW or more, voltage 60 kV or better and current 150 mA or more. There should be high level of generator and tube stability.

Diagnostic software should allow access to all important parameters of the generator.

X-ray tube should be Rh end window type with 4 kW rating or more, voltage 60 kV or better and current 150 mA or more. For better sensitivity in the analysis of lighter elements, the X-ray tube Be Windows Thickness should be 75 microns or less. The X-ray spectrometer must have a protective covering/feature to deal with accidental sample spillage and corrosive samples. The vendor should ensure special provision in the tube for drift free performance of minimum 2 years. It should have facility for Auto Tube Breeding, monitoring tube life, generator flashes, water flow, temperature, pressure inside goniometer and other status.

5. OPTICS

Collimator: collimator masks compatible with the diameter 40mm of sample pellet / bead shall be provided. Adequate primary collimator system with choice from ultra- high resolution to coarse should be available to optimize the measuring conditions for each element to cover ppm to percentage concentration range.

Along with high resolution collimator, a low-resolution collimator should also be provided for the characterization of light elements like Be, B, C, N and O.

Beam path: The X-ray beam path shall be selectively changeable between vacuum, air and helium medium. Measurement medium shall be vacuum for solids, fused beads and pressed pellets; Helium for powder and liquids.

Tube filters: Minimum four primary beam tube filters shall be attached including primary beam stopper.

Crystals: Crystal mill shall be bidirectional and equipped with minimum eight positions for crystals. PET, LiF 200, LiF 220, Ge (curved), suitable crystal for measuring Oxygen to Magnesium to be quoted.

Spinner: Sample spinner with 30 rpm or better to be inbuilt and to be quoted.

Detectors: Provision for at least 2 types of detector, Gas flow proportional & scintillation detector. The detectors should be offered for optimum coverage of entire elemental range.

Goniometer: The goniometer shall be gearless/ with high precision gear, microprocessor controlled. Angular accuracy and reproducibility figures to be specified by vendor with documentary evidence.

In case of any back-lash error, the system should be capable of correcting it automatically. Temperature stability should be 0.05 °C.

6.Control Software with license:

Upgradation and/or updating of software should be free of cost for lifetime. It will be the responsibility of instrument supplier.

User friendly intelligent software should be quoted with following features.

- a) Spectrometry software should be WINDOWS based latest version including multi point background correction, line overlap correction, ratio correction, auto PHD measurement, calibration curve quantitative analysis incorporation matrix correction (based on different mathematical model), recalibration program, full screen color graphics capabilities, limit checks, statistical evaluation, calculation of concentration function for quantitative analysis, data storage and retrieval with multi connecting facilities etc.
- b) Extensive analytical software package for qualitative, quantitative, and standard-less analysis of various samples to be quoted. The supplier shall be responsible for the calibration of standard less program whenever it is required at customer's end at free of cost even after the completion of warranty.
- c) The software and hardware for remote diagnostics to be quoted as default. The remote diagnostics should be capable of checking the equipment parameters/ calibration etc. from a remote location.
- d) A choice of various calibration models and fundamental parameter method must be included in the analytical software package.
- e) Fixed alpha correction facility and reporting should be available with the software.
- f) Instrument updates should be possible per channel by measuring monitor samples or pre-analytical program by measuring recalibration standards.
- g) Theoretical alpha correction software facility should be offered under basic system.
- h) The licensed copy of the software (including analytical software for XRF) shall be supplied in CD- ROM with necessary help.
- i) All operational manuals/ flow charts, instrument manuals, important published literature of reference should be supplied at free of cost in hard copies and soft copies.

7.Computer:

Branded latest configuration high end PC (English US language version) with high capacity hard disk (1TB) and CD ROM drives, 21" TFT color monitor, Key board, mouse should be quoted with color laser jet printer. Separate computer table should be provided for putting the CPU, Monitor and printer of the attached Computer along with two revolving chairs.

1. Power supply for the instrument should be 230 V \pm 10%, 50 - 60 Hz \pm 5% as per Indian Standard with protective RF ground. Spectrometer should use 230 V \pm 10% single phase/ three phase. The required material for RF ground shall be provided by the supplier.
2. **Reference samples:** Reference sample set (set of 5 glass samples) for calibration maintenance (drift correction) should be quoted.

8. ACCESSORIES

8.1 UPS: The vendor shall supply UPS (with 15 kVA or suitable for XRF machine) with isolation transformer in output voltage and 30 minutes back up suitable for the XRF from reputed brand (with quality certificates), It shall contain maintenance free batteries and vendor shall be responsible for maintenance of the UPS also.

8.2 Sample Grinding and Vibratory Cup Mill:

Semi-automatic with display. 1 Tungsten Carbide lined Bowl, - 150 ml capacity, 1 Chrome Steel Bowl – 150 ml capacity.

8.3 Pelletizing Press

Pelletizing press: The vendor shall supply one pelletizing press 25-30 T capacity of reputed make, with tools and die (40mm) of reputed make. Wax- 1kG and cellulose binder- 1 KG. Pressing tool for steel rings-1 No. Pressing tool for Aluminum cups – 1No. Aluminum cups: 1000 nos. Steel rings of 40 mm diameter: 20 Nos
Micro pelletizer of reputed make for the preparation of small pellets and characterization of small-scale samples.

8.4 Air Compressor (If necessary, for the smooth functioning of XRF): The compressor should be of reputed make & compatible with XRF. The compressed air should be of instrument grade, dry and oil free.

8.5 External water chiller:

The party shall supply one external chiller of a reputed manufacturer.

8.6 Gas Cylinder and Regulator

- I. P-10 Gas Cylinder with Regulators: **2 Nos.** (99.9% purity) for each unit. Purity certificate should be provided.
- II. Helium gas cylinder with regulator: **2 Nos.** for each unit.

8.7 Sample Tray & Holders:

Sample tray with provision for a minimum of 40 or more nos. of sample holding capacity in X-Y mode. 10 no. of steel sample holders to handle sample of 40 mm dia. may be provided. The vendor shall supply at least 500 disposable cups & mylar film (90 mts.

Rolls-2 rolls) appropriate for loose powder and liquid sample analysis.

Liquid sample holders should be provided with the instrument.

Sample tray and holders for small scale samples should be provided with the instrument.

8.8 Spares:

Vendors should confirm availability of spares for at least 10 years from the date of installation.

8.9 Standards

Standards for cement samples to be mentioned separately in the tender along with the cost. The properties of the standard to be mentioned also.

9. Warranty:

3 years standard warranty from the date of satisfactory installation and the supplier must enter into AMC for XRF, Chiller, UPS and sample preparation equipment.

10. Annual Maintenance Contract(AMC): (Compulsory)

The supplying company shall undertake “Annual Maintenance Contract” (AMC) of the supplied instrument, at an additional cost/charge, immediately after completion of the Warranty Period.

11. Installation:

Installation & commissioning at site at no additional cost.

12. User Training at Site:

- 1) Training in India: 5 working days user training at the installation site on operation and calibration after commissioning.
- 2) All expenditures for imparting user training will be at no additional cost.
- 3) Since there will be no additional cost in Training element, the bidder need not to quote any cost towards training.
- 4) Prompt willingly telephonic support to operator should be provided by the supplier, as and when required.

Note: - Equipment should be supplied with warranty and AMC executed