

## WTM – TOOLING

WTM/2024/Metal Analyzer/01 Rev. 00

Date : 09.10.24

### SPECIFICATION OF HAND HELD PORTABLE XRF METAL ANALYZER

This Product standard covers the Technical requirement of hand held portable XRF metal analyzer for water turbine manufacturing division.

#### **1. Scope of Supply**

Supply, installation, commissioning and training of hand held portable, Energy Dispersive X-Ray Fluorescence (EDXRF) analyzer for elemental composition of metallic materials at BHEL Bhopal.

#### **2. Technical Specification**

Technical specifications for portable handheld XRF metal analyzer is provided in Table 1 below:

**Table 1**

Sl No.	Technical Parameter	Technical Specification	Specified /to be confirmed by	Vendor's remark
1.0	Element detection range	All elements in the range Mg (Z=12) to U (Z=92) present in the metallic component shall be analyzed and reported in the form of weight % on the display unit. The list of detectable elements shall include Al, Mg, Si, P, S, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Zr, Nb, Mo, W, Ta, Re, Pb, Bi, Ag, Au, In, Ir, Cd, Sn, Se, Pd, Pt, Sb.	Vendor to Confirm	
2.0	Excitation Source/probe beam	Rhodium (Rh) / Tungsten(W) / Silver (Ag) anode based X-ray tube capable of operating up to 8-50 kV $\pm 10\%$ suitable for analysis of low Z and high Z elements.	Vendor to confirm & specify	
3.0	Detector	Si-PIN diode or Silicon Drift Detector (SDD)	Vendor to confirm & specify	
4.0	Operating environment	Temperature: 5 °C to 50 °C Humidity: 20% to 95% relative humidity	Vendor to Confirm	
5.0	Measurement area	Suitable spot size shall be specified by vendor	Vendor to specify	
6.0	Ingress protection (IP) rating	Effectiveness of protection of instrument from intrusion of dirt, dust and moisture etc. shall be as per IP 54 rating or better.	Vendor to Confirm	

7.0	Safety provisions for the instrument and operation	<p>1. Password protection for device operation</p> <p>2. X-ray enabling only in presence of sample using a IR proximity sensor.</p> <p>Safety provision for X-ray detector:</p> <p>a. Shock and water resistant case.</p> <p>b. Belt straps/wrist straps /stand to handle the instrument in a safe and handy manner for operation.</p> <p>c. Carrying case for safe transport.</p>	Vendor to Confirm	
8.0	Display with touch	High resolution LCD display with touch screen (about 4"). The display unit shall be transfective for clear readability in the daylight.	Vendor to Confirm	
9.0	Power supply	<p>1. Re-chargeable Li-ion battery of suitable rating for continuous operation up to 6 hours or more.</p> <p>2. Suitable rating battery charger for charging batteries with appropriate supply cord to operate from an AC power source (100-240 VAC, 50-60 Hz.) shall be provided.</p> <p>3. One no. spare batteries to be supplied along with main supply i.e. total 2 no. of batteries is required.</p>	Vendor to Confirm	
10.0	Weight of the instrument	≤ 2.5 kg along with battery	Vendor to Confirm & specify	
11.0	Data storage and transfer	<p>1. Internal memory: Capability to store minimum 5000 readings of composition and corresponding spectra.</p> <p>2. Data transfer: Through USB memory stick/USB 4.0 port for connection to computer for data transfer. The instrument software should support Microsoft windows 10 or higher latest version of the PC for data transfer and readable through Microsoft-Word/Excel (chemical composition data and corresponding EDS spectra).</p>	Vendor to Confirm & specify	

12.0	Device/instrument software	<p>1. The operating system of the instrument shall be licensed version.</p> <p>2. The supplier shall provide backup of all essential software related to OS and application software in the form of flash drive.</p> <p>3. Automatic grade identification using database of standard grade library covering various International standards including alloy steels, Stainless steels, Cr-Mo alloys, Tool steels and other alloys of cobalt, nickel etc.</p> <p>4. The supplier shall agree to provide technical support and free software upgrade/reinstallation of OS and application software in case of any software failure in the instrument for a period of 7 years from the date of supply.</p>	Vendor to Confirm & specify	
13.0	Calibration and report generation	<p>1. Suitable calibration mechanism to calibrate instrument with three standard specimen of different alloys of stainless steel.</p> <p>2. Report generation in English language with details of Specimen ID, date and time of analysis, chemical composition and corresponding EDS spectrum.</p>	Vendor to Confirm & specify	

### 3. Bidder's pre-qualification criteria

a. Only Original Equipment Manufacturer (OEM) or OEM's authorized dealers are eligible to participate in this tender. In case of authorized dealer, copy of valid dealership certificate from OEM must be submitted along with the offer.

b. Only those vendors should quote who have supplied and commissioned in the past 10 years (on the date of opening of Tender) at least One similar equipment of offered make and same has been supplied by the OEM or their authorised dealer in India.

c. Copy of Purchase Order (PO referred to sl. "b" above) along with unpriced invoices in the name of OEM or its authorised agent is to be submitted along with the offer.

Note: The type, make and model number of the equipment should be clearly mentioned in the PO copy.

d. OEM's declaration to support uninterrupted operation and preventive and break down maintenance of the offered instrument.

e. Performance certificate from the customers regarding satisfactory performance of instrument supplied to them vide Purchase Order mentioned at sl. "c" above (Original Certificate or through Email directly from the customer).

f. The following Information should be submitted by the vendor about the companies where referred equipment have been supplied. This is required from all the vendors for qualification of their offer.

(i) Name of the customer/company where referred equipment is supplied.

(ii) Complete postal address of the customer.

(iii) Month & Year of supply.

(iv) Name and designation of the contact person of the customer.

(v) Phone, FAX no, and email address of the contact person of the customer

Note:

1. BHEL reserves the right to verify the information provided by the Vendor for the referred instrument at their referred customer's works. In case the information provided by vendor is found to be false/incorrect the offer shall be rejected.

2. Authorized after sales service network shall be available in India to provide after sales technical support. Full details of authorized technical support personnel shall be provided in the bid.

#### **4. Post tender technical clarification**

The bidder shall provide information requested by purchaser during the technical evaluation of the offered product in the prescribed period as specified by BHEL. Failure to respond within the specified period will be considered as no response and the offer may be rejected on the ground of not meeting the technical specification.

#### **5. Inspection**

5.1 Along with the offer vendor has to submit QA plan for comments & approval.

5.2 Inspection & testing of complete equipment along with all accessories will be carried out at OEM or their authorised dealer's works by BHEL or BHEL appointed third party as per approved QA plan.

#### **6. Acceptance criteria:**

The acceptance of the instrument requires:

6.1 Demonstration of full functionality of the handheld XRF analyser as per the technical specifications at BHEL including compositional analysis of standard sample set provided by the BHEL, report generation, data transfer to computer etc.

6.2 Supply of calibration certificate provided by the OEM,

6.3 Supply user's manual of the instrument that includes safety instructions during operation and maintenance of the instrument and

6.4 Completion of training at BHEL Bhopal.

6.5 Final acceptance of instrument will be given after successful trial (acceptance criteria 6.1 to 6.4), installation, commissioning and training at BHEL Bhopal.

## 7. Warranty

The XRF analyser & all accessories shall be warranted for 2 years after Acceptance with total free replacement of defective parts (Warranty Certificate shall be provided).

If any problem arises at workshop, supplier shall attend the problem free of cost, and if need arises should supply additional material free of cost.

## 8. Documents

Following documents shall be supplied to BHEL, Bhopal in hard copies and in electronic form i.e. compact disc (CD) compatible with latest PCs.

(a) Calibration certificate	01 copy
(b) Guarantee Certificate	01 copy
(c) Packing List	01 copy
(d) O & M Manuals	01 copy
(e) CD containing above	01 copy

O & M Manuals must contain sketch / Drawings of instrument and Handling Instructions. It should also contain DOs, DON'Ts, Health and safety recommendation & precautions, Trouble shooting and component check points.

## 9. Packing and transport

OEM or their authorized representative is responsible for proper packing and safe transport of the Handheld XRF analyzer to the BHEL Bhopal. The supplier shall ensure that the instrument is properly packed with strong case for shipment so as to ensure its being free from any loss /damage /deterioration during transit and delivery to BHEL's store at Bhopal.

## 10. Training

Hands-on training through authorized representative shall be provided to users at BHEL Bhopal for safe operation of the handheld XRF analyzer including details of hardware components, OS, application software, calibration checking, chemical composition analysis of various standard specimens and others (sheet, rod, metal samples etc.) trouble shooting, report generation, data transfer and saving the spectra and composition results to other computers through USB or other means.

## 11. Delivery schedule

The desired delivery period is within 10-12 weeks of placement of purchase order.

### **CHECK LIST**

**Ref. Specification no. : WTM/2024/Metal Analyzer/01 Rev. 00 Date: 09.10.24**

(To be filled in by vendor)

<b>SL. No.</b>	<b>Description</b>	<b>Vendor's comment</b>
1	Vendor to submit brochure of the offered make and model which should contain complete technical specification of the offered instrument.	<b>Yes / No</b>
2	Vendor to confirm that scope of supply in offer is in line with clause 1 (scope of supply) of specification and quoted items meet all technical requirements of clause 2, table 1.	<b>Yes / No</b>
3	Vendor to confirm & specify all required details in vendor remarks column in table 1.	<b>Yes / No</b>
4	Vendor to confirm that they meet Bidder's pre-qualification criteria as per clause 3 & submit all documents including OEM/authorisation certificate (if applicable), PO copy, Performance certificate, OEM declaration etc.	<b>Yes / No</b>
5	Along with the offer vendor to submit Quality Assurance plan for comments & approval from BHEL.	<b>Yes / No</b>
6	Vendor to accept Inspection & acceptance criteria as per clause 5 & 6 respectively of specification.	<b>Yes / No</b>
7	Vendor to accept warranty period as per clause 7.	<b>Yes / No</b>
8	Vendor to confirm documentation, packing-transport and training as per clause 8, 9 and 10 respectively.	<b>Yes / No</b>
9	Vendor to confirm that all points of specification have been complied in all respect and there is no deviations from specification. (In case of deviation, same shall be furnished along with the offer)	<b>Yes / No</b>