

3

Indent No. 20140978
Date 16-5-14

SPECIFICATION FOR PORTABLE XRF SPECTROMETER

Date: 16.05.14

Technical Specification

1. The Portable XRF Spectrometer shall be used for the analysis of elemental constituents of metals & alloys, including ferrous and non ferrous metals, irrespective of sample size, shape & form.
2. While the instrument is expected to operate in the grade analysis & pass-fail modes, the main usage of the instrument shall be accurate elemental analysis only. Supplier to ensure that the model quoted meets this primary requirement.
3. The analyzer shall use a low power X-Ray tube for excitation of the elemental atoms and the analysis results shall be displayed either on the integrated screen or PDA. Print of reports /results is required by connection through USB port.
4. All elements from Magnesium (without need of Helium purging) to Uranium in ferrous and non ferrous matrices shall be analysed & each analysis shall be accompanied by percentage error of each element analysed.
5. The matrices, the elements in these matrices, the range of concentration of the elements that are to be analysed in them are given in Annexure-I. For each of these matrices, the supplier shall provide data as to whether each of the elements can be detected, the detection range and, the percentage errors for this element within this range.
6. The equipment as delivered should be capable of performing the analyses detailed above. If any matrix-element range is not in the standard protocol of supply/ display, the supplier should indicate the same along with the possibility of factory calibrating for these combinations.
7. As far as the internal library of grades is concerned, the supplier shall give a list of grades with their compositions available in the library & the possibility of adding our plant grades in the library. Additionally, it is to be indicated as to how the grade determination is done i.e. the percentage deviation from the nominal composition that qualifies an analysis as belonging to a particular grade.
8. The hardware specification of the equipment shall meet the requirements given below. Supplier shall confirm that each of these parameters can be met.

- | | |
|----------------------|---|
| i. Design | Ergonomic pistol grip design |
| ii. X Ray Source | Low power X-Ray tube. The anode used shall be such as to be capable of detecting 0.05% Ag in Cu matrix. Tube life min. 5 yrs warranted. |
| iii. Detector | High resolution SDD type |
| iv. Power Source | Rechargeable Li-ion batteries with hot swap capability. There should be no data or standardization requirement during swap. Each battery to have minimum 6 hrs continuous operational capability. |
| v. Display & Control | Integrated touch screen or PDA with touch screen Spectrometer should be controllable using this & specimen I.D. etc. should be capable of being entered using this. |
| vi. Memory | At least 3000 test results with spectra |
| vii. Standardization | Only during startup |

[Handwritten signature]
A. S. Swamy

[Handwritten signature]
R. S. Swamy

2

Indent No. 20140978
Date 16-5-14

viii. Standard accessories:

1. Four (4) Li-Ion battery packs
 2. 220 V charger for battery pack
 3. Verification standard
 4. X-Ray Tube
 5. Weld collimator
 6. Benchtop instrument stand
 7. Samples of calibration for test and result verification
 8. Accessories required to connect XRF spectrometer to PC.
9. Along with the offer, the supplier shall give complete details of calibration /standardization procedure for the matrix & elemental ranges given above. Supplier to also clearly indicate as to whether a single standardization give accurate results all matrices, or, different types of standards are required, and, if so, what will be the standards required for the above range.
10. Along with the Main equipment, the supplier shall separately quote for the following optional items:-
- a. AC adapter for working directly off 220 V, 50 Hz, AC supply.
 - b. Spare PDA (where applicable)
 - c. Adapter for wires & rods
 - d. Any other accessories / software available with detailed technical write-up regarding utility
 - e. Extra certified calibration standards with detailed composition.
11. The equipment shall be commissioned in our laboratory by the suppliers' representative, who shall demonstrate the complete functioning of the equipment, and capability to meet our analytical requirements.
12. **Warranty**-The instrument shall be warranted for satisfactory working for **24 months** from the date of commissioning. In case of withdrawal of supplied equipment by supplier from our plant for the purpose of repair, another same model & type functional equipment shall be deposited to the indenter to cater to day-to-day work load.
13. Along with the equipment, the supplier shall give 3 copies of operation & maintenance manuals with complete circuit diagram of the main equipment & all its accessories.
14. Pre-dispatch inspection is not required.
15. Along with the offer the supplier shall give:
- a. The details of his service network, with details of service personnel & their experience in repair of the model of instrument offered, especially in the northern region of the country.
 - b. List of users, with name, complete address, e-mail etc.
16. The offer should be accompanied by detailed technical literature. The offer should address each of the requirements given above with complete technical details. Compliance statements shall not be considered.
17. Supplier to note that the commitment against each & every clause above, shall be checked during commissioning & if not found complying the instrument is liable to be rejected.
18. **Annual Maintenance Contract(AMC)**:-
Post-warranty, the supplier shall cover the equipment under **AMC for 3 years**. In case of withdrawal of supplied equipment by supplier from our plant for the purpose of maintenance, another same type functional equipment shall be deposited to the indenter to cater to day-to-day work load.

[Handwritten signature]

[Handwritten signature]
Chowdhury

1

Indent No. 20140978
Date 16-5-14

Annexure- I

Element	Iron base	Tin base	Cobalt Base	Copper Base	Nickel Base	Aluminium base
Mn	0.10-25.0		0.1-2.0	0.1-3.0	0.1-30.0	0.1-2.0
Cr	0.1-30.0		0.50-30.0	0.01-1.0	0.1-30.0	
Mo	0.05-5.0		0.5-10.0		0.1-30.0	
Ni	0.02-50.0	0.01-1.0	0.5-15	0.01-30.0	base	
Cu	0.05-3.0	0.1-6.0	0.05-3.0	base	0.1-5.0	0.1-10.0
Fe	base	0.01-2.0	0.5-10.0	0.01-2.0	0.1-20.0	0.01-2.0
Co	0.01-15.0		base	0.001-0.1	0.1-25.0	
W	0.10-25.0		0.50-15.0		0.1-10.0	
Nb	0.05-5.0		0.50-15.0		0.1-5.0	
V	0.05-5.0					
Ti	0.02-10.0				0.05-5.0	
Sn				0.1-10.0		
Zn				0.1-50.0		
Pb		0.01-1.0		0.1-5.0		
As				0.001-0.1		
Sb				0.001-1.0		
Cd						
Ag				0.05-50.0		
Zr				0.001-1.0		
C	0.01-4.0					
Se				0.001-0.1		

(A. S. W. S. W. S. W.)

Handwritten signature