

SPECIFICATION FOR XRF ANALYZER
SPECIFICATION NO. MECH/M&P/3100/GM/27

1.0 IMPORTANT INSTRUCTIONS TO TENDERERS FOR FILLING TECHNICAL BID

- 1.1 Bidders are required to give clause wise comments on the technical specifications, confirming compliance/non-compliance with details of deviations if any along with their effect on the performance. Back references to be avoided, offers are likely to be ignored in case of non-compliance of these instructions for furnishing the information.
- 1.2 Unless otherwise stated, latest alterations/ revisions of specifications/ standards/ drawings shall be applicable. In respect of safety standards and environmental standards relevant to the machine, the machine manufacturers shall ensure compliance with international (CE/ISO/DIN/JIS)/National standards (IS) (where applicable).
- 1.3 Tenderers should offer and quote for all the specified concomitant accessories, as these are considered essential for commissioning and utilization of the machine. Even if bidder does not recommend the purchase any of these accessories, the price must be quoted for comparison purposes and their recommendation/suggestion indicated in the offer. Tenderers should also quote for optional accessories, spares and consumable spares as asked in the specifications.
- 1.4 In case, any item is required in sets, please specify nos./pieces per set. This is essential for proper technical evaluation of the offer. Offers received without this may be considered as incomplete and liable to be rejected.
- 1.5 The bidder should quote only for the specified make of sub-assemblies and equipment wherever specified. Makes of sub-systems other than the specified ones will normally not be acceptable. In case, some other make is quoted, specific reasons for the same including its features/advantages over specified makes must be brought out in the offer.
- 1.6 In case there is a contradiction in any information provided (some parametric values given in the specification and those given in the brochure or some other document enclosed by the tenderer), unless specifically mentioned in the deviation cum confirmation statement the values as given in the specification shall be taken as confirmed by the tenderer and offer evaluated accordingly.
- 1.7 The Purchaser may accept internationally accepted alternative specifications which ensure equal or higher quality than the specifications mentioned in the Technical Specification. However, the decision of the Purchaser in this regard shall be final.
- 1.8 Purchaser reserves the right to verify the details submitted by the bidder by actual site visits.
- 1.9 Other terms & condition of the contract will be as per Indian Railway Standard conditions of contract.

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2.0 DESCRIPTION

The XRF Analyzer is required for analysing chemical composition and grade analysis of ferrous & non – ferrous metals and alloys.

3.0 SCOPE

The Contract shall cover –

1. The supply and delivery of XRF Analyzer.
2. Installation & commissioning of equipment at RCF/Kapurthala free of cost.
3. Training to personal regarding operation and maintenance at RCF Kapurthala to entire satisfaction of the purchaser.

4.0 GENERAL FEATURES

- 4.1 The instrument should be portable, accurate and versatile hand held XRF analyzer.
- 4.2 The instrument is required for positive Material Identification (PMI) & Alloy verification.
- 4.3 It shall give the freedom to work in the Lab or in the field to analyse chemical composition of ferrous and non- ferrous metals/alloys.

5.0 TECHNICAL REQUIREMENTS

- 5.1 XRF Analyser shall have the elemental detection technique which can measure the amount of various elements in percentage in the samples of metals & alloys.
- 5.2 The results of the analysis shall be given on some type of display or built in LCD/ LED. It shall have the facility to display therein the results in the form of table displaying all the elements that the Analyzer detects as well as the concentration of each element accordingly.
- 5.3 XRF Analyzer shall be equipped with calibration and standardization facilities that allow the user to measure composition of metals for identification/ verification of grades with appropriate metal calibration. The analyzer shall be capable to identify the grade of alloys in addition to the list of elements detected.
- 5.4 XRF Analyzer should take 05-10 seconds for the elemental chemical analysis including light elements. It shall take 02-05 seconds for lot identification showing the alloy grade/class etc.
- 5.5 It shall analyse / detect 36-40 elements including light elements such as Mg, Al, Si, S and P etc.
- 5.6 Little or no sample preparation shall be required for alloy detection / analysis.
- 5.7 It shall analyse samples regardless of shape and size.
- 5.8 All types of metal/alloy samples from a single strand of 1mm metal wire to finished welded bead, rods, bolts, plates, screws and complete fabricated assemblies can be tested by just touching the analyzer to the sample and measurement with a brief trigger pull.
- 5.9 It shall be provided with waterproof rugged carrying case.
- 5.10 It shall have moulded rubberized handle for enhanced grip.

6.0 TECHNICAL SPECIFICATION

The hand held XRF Analyzer shall have following technical parameters.

- 6.1 **Weight** :- Should not be more than 2.0 Kg.
- 6.2 **Dimensions** :- Appropriate dimensions so that it can be easily handled.
- 6.3 **Power / Batteries** :- Rechargeable Batteries (2nos.) minimum 08hrs Operating time and it shall have battery charger & AC adopter.
- 6.4 **Operation** :- Trigger or start / stop icon or buttons.
- 6.5 **Measurement Time** :- 5-20 seconds.
- 6.6 **Detector** :- High resolution SDD (Silicon Drift Detector)
- 6.7 **Elemental Range** - Mg(12) to U (92)

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- 6.8 **Excitation Source** -4 W (Min.) X-Rays Tube.
- 6.9 **Environmental /Working Temp Range** –(-)10 °C. to+ 45°C.
- 6.10 **Tech. Capability** :- Shall be capable to detect 40 elements including light element such as Mg, Al, Si, S, and P etc.
- 6.11 **Standard Alloy Library** :- It shall include grade library with more than 300 common grades like plain Carbon Steel, Low Alloy steel, Tool Steel, Stainless Steel (including all types of ferritic & austenitic steel), Copper & Cu-base alloys, Aluminium Alloys. It shall have the provision for addition and calibration of standard grade /element /alloy as per future requirement.
- 6.12 **Testing Mode** :- Alloy Grade Composition, Spectrum view and Pass /Fail modes.
- 6.13 **Electronic Systems** :- Inbuilt integrated PC With touch screen.
- 6.14 **Display Screen**:- High resolution minimum 4” detachable coloured Torch Screen having brightness to provide easy viewing in the ambient lighting conditions.
- 6.15 **Date Display** : - It shall display concentration in. Percentage up to three digits after decimal i e 0.001% on all modes.
- 6.16 **Data Transfer to PC** :- Mini USB Cable, mini SD Card or wireless bluetooth
- 6.17 **Standard Elements** :- Pb, Cr,Cd, Sb,Bi, Ti, Mn, Fe, Ni, Cu, Zn, Sn, Ag, As, Ba, Co, Zr, W, Ti, V, Mo, B, Nb, Sb, Au, etc. Light Elements-Al, Mg, Si, S&P etc
- 6.18 **Standard Alloy Calibration** :- Plain Carbon Steel, Low Alloy steel, Tool Steel, Stainless Steel, (austenitic Viz.AISI 202,304,315&Ferritic Viz, AISI 409 409M), Cu & Cu base alloys, P-Bronzes, Aluminium alloys, Ai-Si-Mg alloys.
- 6.19 **Energy Saving Mode** :- Energy saving mode to be activated when instrument is kept not working after 5 minutes.
- 6.20 **Radiation Safety** :- It Shall have sensors to avoid emission of radiations for the safety of the operator. No harmful radiation shall come out from instrument.
- 6.21 **Self Diagnostic Feature** :- It shall have online display of Instrument Status for diagnostic error or faults.
- 6.22 **Security** :- Password protected user security.
- 6.23 **Memory Date Storage** :- 512 MB minimum, Standard Memory Storage Capacity –more than 10,000 Test Results with minimum 4 GB Flash Card.
- 6.24 **Operating System** :- Microsoft Windows (Portal System) Windows (PC based).
- 6.25 **Date Transfer** :- USB IR Communication Wireless, Bluetooth or Memory Card etc.
- 6.26 Standard Accessories :-**
- a) Locking shielded Carrying Case.
 - b) Shielded Belt Holster & Safety Lanyard.
 - c) Spare Battery Pack
 - d) 110/220 V AC Battery Charger.
 - e) PC Connection Cable
 - f) Check Samples / Standards.
 - g) Printer
- 6.27 **Printing Software** :- It shall have wireless printing package for results in hard copy form.
- 6.28 **Standards** :- Adequate set of standards shall be provided to cover main types of steel & alloys with XRF Analyzer.

7.0 CONSUMABLE ACCESSORIES

As per requirements of instrument, consumable & accessories should be supplied along with equipment free of cost for smooth functioning of the XRF Analyzer up to 5 years.

8.0 CONCOMITANT ACCESSORIES

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8.1 The tenderer shall supply a list of concomitant accessories, which will be supplied along with the machine. The cost of each listed concomitant accessory should be quoted separately. Wherever for any reason the cost of any concomitant accessory is included in the basic price of the machine, the same should be specifically mentioned.

8.2 Any other accessory, which in the opinion of the tenderer can contribute to higher production rates, should be indicated and quoted separately.

9.0 OPTIONAL ACCESSORIES AND SPARES

9.1 The tenderer should furnish details of optional accessories & spares covered under warranty.

9.2 The tenderer should be furnishing the price list of optional accessories & spare parts required for two years normal maintenance of the equipment.

9.3 List of recommended optional accessories & spares for normal maintenance after expiry of warranty period to till useful life of the equipment.

9.4 Life estimated/expected for each equipment and its sub assembly.

10.0 OPERATING CONDITIONS

The equipment shall be capable to operate at temperature -10°C. to +50°C, Relative Humidity 90% max.

11.0 COMMISSIONING AND PROVING OUT

11.1 The Successful tenderer shall have to commission the machine within 30 days from the date of receipt of machine at RCF, Kapurthala.

11.2 The successful tenderer shall have to prove out the performance of the machine at RCF premises to the entire satisfaction of the consignee.

12.0 TRAINING OF STAFF

The training for operation, maintenance and trouble shooting of the Equipment shall be provided to 3 persons of RCF to their full satisfaction free of cost at RCF, Kapurthala.

13.0 ELIGIBILITY CRITERIA

13.1 The tenderer shall be registered on IREPS website (www.ireps.gov.in) to participate in the tendering process.

13.2 The tenderer shall have established quality control system and organization to ensure the supply of good quality products to the purchaser.

13.3 The tenderer shall provide a performance statement giving a list of major supplies of same/similar equipments effected in last 5 years to the reputed organizations giving details of the order no. and date and the quantity supplied and whether the supply was made within the delivery schedule. Such period shall be reckoned from the date of opening of tender.

13.4 References must be given to prove that the instrument model quoted is latest one and has earlier been installed at least 03 locations and has been successfully operating for last 02 years.

Tenderer not submitting the requisite information may note that his offer is liable to be ignored.

14.0 MAKE

14.1 Country of origin of the items should be of USA, Germany, Japan, Australia, India or Russia only.

14.2 The supplier shall furnish the complete details of Model No. Make & Manufacturer's details/ address, Country and authorization details of Dealership. The XRF Analyzer shall have National / International Traceability and reputation.

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14.3 The firm shall provide the calibration certificate of National / International Traceability along with the equipment.

15.0 AFTER SALES SERVICE

The supplier shall provide after sales service within warranty period as well as after warranty and shall be able to repair & replace various spares required from time to time and shall be capable to remove the problems with respect to instrument in time.

16.0 TECHNICAL LITERATURE:-

The supplier shall supply the following manuals:

- a) Operating / Maintenance Manuals 03 copies
- b) Spare Part Manuals with Price list 03copies
- c) Electric /Electronic Circuit diagrams 03 copies
- d) Safety Manuals 03 copies

17.0 SPECIAL FEATURES

Special features incorporated into the machine, if any shall be indicated separately by the tenderer, clearly indicating the advantage of these features.

18.0 DEVIATION

18.1 The tenderer should clearly certify that the machine offered fully meets the specification various design features incorporated in the machine to fulfill different technical performance requirements should be fully explained in the offer. However, minor deviations from this specification, which do not affect or in any way interfere with the stipulated performance standards, or would result in improved safety/reliability or would reduce recurring maintenance/operating cost of the machine, can be considered for acceptance.

18.2 Firm has to disclose the typical standard deviation for lower and higher range of elements.

19.0 WARRANTY

The warranty condition of contract will be as per IRS conditions or as quoted by the tenderer whichever is later.

Note: Tenderer to furnish following detail of the XRF Analyzer offered

S.no.	Technical Parameter	Offered by Tenderer

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