

**Technical Specification for Laser Based Portable Handheld Spectrometer**

S. No.	Items	Specification
1.	Item	Laser Based Portable (Handheld) Spectrometer.
2.	Make	Hitachi/Evident/RIMLAS/ NPPSD, Russia or equivalent.
3.	Language & script	English as mandatory language in roman script for all purpose in the equipment as well as of software and hardware.
4.	Main Unit & Display	Portable, handheld, of suitable ergonomic design, & based on Laser-induced Breakdown method. Color touch screen, size: 5 inch minimum for better view
5.	Radiation Source	Solid State laser (Pulsed Diode-Pumped Solid-State (DLSS) laser of wavelength -1064 nm)
6.	Metals detection	Capable of identification of alloys with display of grade name/ ID (Through in-built library) and percentage composition along with Carbon equivalent (CE) values of the chemical elements in the materials such as low, medium, high carbon steels, ferrous alloys, stainless steels, cast iron, non-ferrous alloys and metal scraps. The Standard Element Mode for - 1. Fe Based: C, Si, Mn, Cr, Ni, V, Cu, Ti, Mo, Co, Al, Nb, W, Mg, Zn. 2. Al Based: Si, Zn, Mn, Mg, Fe, Cu, Ni, Be, Ti, Cr, Cr, Cd, Sb, V. 3. Cu Based: Si, Zn, Mn, Al, Be, Sb, Ni, Sn, Pb, Fe, Cr. 4. Ni Based: Al, Si, Ti, V, Cr, Mn, Fe, Co, Cu, Nb, Mo, W, C. 5. Ti Based: Mo, V, Al, Fe, Cr, Zr, Mn, Sn, Ni, Nb. 6. Zn Based: Al, Cu, Fe, Sb, Sn, Mg, Pb.
7.	Power Supply	Direct power source connection to 220V AC as well as through suitable replaceable Li- ion battery for 8-10 hrs. operating time, minimum 200 Sparks.
8.	Operation Environment	Temperature range: -10 °C to 50 °C and continuous full duty cycle with optional fan. Humidity: 10%-98% RH non-condensing.
9.	Features	1. Measurement point size: 50 microns, Spot Size: 8 mm maximum. 2. Unsurpassed resolution of 0.01 nm over the entire measurement range. 3. Working spectral range 177-380 nm 4. High resolution camera to capture location of analysis.


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10.	Operating System & software	<ol style="list-style-type: none"> <li>1. Suitable Operating system for instrument with automatic software updates. Should contain a library of maximum known grades and its matching feature display. Option to add the alloy grade to the system, i.e. user programmability.</li> <li>2. Capable of auto read/analyze, display test results and generate the report.</li> <li>3. Function stand-alone and through Windows PC controlled operating system/ Android Mobile app.</li> <li>4. The license(s) of all application and allied software, support for all upgrades /patches shall cover entire codal life (Minimum 15 years) of the equipment and be guaranteed from original developer free of cost during the period.</li> <li>5. The application software shall be OEM, designed for safe archiving (Year Wise, Month Wise, Date Wise, Item Wise with unique ID) and easy retrieval of such reports.</li> <li>6. The application and allied software of the equipment are designed to connect the remote service for diagnostics and repair. The supplier shall ensure such diagnostics and repair at the time of exigencies.</li> <li>7. Data Entry: Touch screen, Key board, Mobile software/Application for Android smartphones connectivity, report making etc.</li> </ol>
11.	Standard Calibration blocks & Calibration Certificate	Calibration certificate for all the standard disc or block/s of Low, medium & High carbon steels, Stainless steels, Ferrous alloys, cast iron, Non-ferrous Alloys and scraps as well as of the main instrument traceable to the National / International standards covering the entire warranty period. Yearly calibration of Machine for entire warranty period. (ISO/IEC-17034/2017).
12.	Data Storage & Connectivity	Minimum memory of the equipment -32Gb (to store more than 10,000 readings of spectra), MicroSD slot with removable 32Gb card. USB 2.0/3.0 ports for accessories such as wireless LAN (Bluetooth & wireless (with an optional USB adaptor) & flash drives and connectivity to computer. OR Inbuilt Memory, Bluetooth & Wi-fi.
13.	Safety Features	<ol style="list-style-type: none"> <li>a) Disclosure the safety hazards related to the instrument in detail, if any.</li> <li>b) All safety features to safeguard the personnel operating it.</li> <li>c) Comply with CE, ROHS directives, IP 54 rating, laser emitter safety class less than 4 and IR proximity sensor &amp; help provide NOC from AERB.</li> <li>d) Password protection &amp; solid detector shutter to help protect detector damage.</li> </ol>
14.	Item & Standard Accessories	<ol style="list-style-type: none"> <li>a) Basic Machine (Spectrometer)-01 No.</li> <li>b) Suitable Rechargeable Battery Pack. - 01 Set 02 Nos. (01+01 spare)</li> <li>c) Battery Charger cum Mains Power Pack with Charge Status Indicator. - 01 No.</li> <li>d) Power/Charging cable. 01 No.</li> </ol>

  
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		<p>e) USB cable to connect PC (Data transfer Cord) <b>01 No. OR</b> Wi-fi &amp; Bluetooth.</p> <p>f) Bluetooth &amp; wireless connecting thermal printer with charger adaptor- <b>01 No.</b></p> <p>g) Battery for thermal printer (extra) -<b>01 No. set.</b></p> <p>h) NABL Certified standard reference blocks for Ferrous &amp; S. Steel. -<b>02 Nos each</b></p> <p>i) Sealed rugged carrying case. -<b>01 No &amp; Wrist strap. 01 No.</b></p> <p>j) Shielded belt holster-<b>01 No.</b></p> <p>k) Earbuds Packet- <b>02 nos.</b></p> <p>l) HP USB drive of steel-cast (Min. 64Gb) with data transfer software -<b>01 No.</b></p> <p>m) Illustrated Operation cum Maintenance Manual/ Guide - <b>01 No.</b></p> <p>n) Safety Lanyard &amp; check sample/standards.</p> <p>o) Grade libraries-AISI, DIN BIS etc. <b>01 no.</b></p>
15.	Additional Accessories to be included	<p>a) Earbuds Packet- <b>04 nos.</b></p> <p>b) Additional USB drive (HP make) 64 Gb -<b>01 no.</b></p> <p>c) SanDisk Extreme Pro 128GB microSDXC UHS-I, V30, Memory Card- <b>02 Nos.</b></p> <p>d) MicroSD card adapter (Sandisk/Samsung) -<b>04 nos.</b></p> <p>e) Spares for 02 years of normal maintenance be listed &amp; supplied.</p>
16.	Inspection & Testing	<p>a) To be done at Firm's works/premises by the RITES or approved Third Party Inspection Agency.</p> <p>b) The equipment performance shall be demonstrated by the supplier or his agent after successful commissioning at the consignee's works. Thereafter the equipment performance shall be watched by the consignee for a period of one month, before the final proving test certificate is issued.</p> <p>c) The machine should display the test results of complete element analysis of the different test samples. "RITES (or) Approved third party" inspection should be performed before supply of the machine. Inspection certificate should be submitted along with the supply of the machine.</p>
17.	Installation, Commissioning & Training	<p>a) Firm, through its representative; to supply and deliver the equipment, install &amp; commission the instrument at Office of Chief Workshop Manager, Mechanical Workshop, North Eastern Railway, Izzatnagar 243122.</p> <p>b) The tenderer or his agent will be required to inspect the consignment at the consignee's premises before unpacking and certify/satisfy himself of the receipt of components to avoid subsequent complaints of short shipment or damage on transit.</p> <p>c) Technical experts from the manufacturer will fully and adequately impart <b>practical operational training for the period of 03 working days</b> to 05 nos. of the Railway staff as nominated by the consignee on operation,</p>

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		maintenance/ troubleshooting, data storage, data transfer, backups, retrieval and calibration etc. to the satisfaction of the consignee at the free of cost.												
18.	Warranty/ Guarantee	<p>The instrument should be warrantied/guaranteed comprehensively for any manufacturing/workmanship defects, malfunctioning, abnormality etc. for at least period of 24 months from date of commissioning and the standard, additional accessories &amp; attachments should also be warrantied suitably from the date of commissioning.</p> <p>The details of preventive maintenance to be provided during warranty period shall be indicated by the tenderer giving details of preventive schedule, periodicity on items to be checked, items to be replaced and expected equipment down time. The details of Preventive maintenance services including cleaning of the instrument to be provided under warranty period shall be provided in the following format.</p> <table><tr><th>S. No.</th><th>No &amp; Type of preventive schedule</th><th>Periodicity</th><th>Items to be checked/ Activity to be carried out.</th><th>Items of replacement</th><th>Expected equipment down time</th></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> <p>10% of the P.O. value shall be pledged with Indian Railways as Warranty Bank Guarantee (WBG) until the completion of Warranty period.</p> <p>During warranty period the supplier of his agent should attend the break down within 03 days from the time of reporting (through phone, fax, email or any other means) failure. This period of 03 days shall be treated as grace period which shall not count towards machine down time.</p> <p>i) Beyond which 0.5% of WBG pledged with Indian Railways will be levied as penalty per day.</p> <p>ii) If the total cumulative breakdown days exceed 60 days during each year of the warranty, then the 100% of WBG pledged with Indian Railways shall be confiscated.</p> <p>During warranty the supplier should replace or repair all the defective parts on free of cost to run the Equipment in smooth working condition.</p> <p>The cost of maintenance during the warranty period is included in the basic price of the instrument.</p>	S. No.	No & Type of preventive schedule	Periodicity	Items to be checked/ Activity to be carried out.	Items of replacement	Expected equipment down time						
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19.	After sales Service	The supplier should be able to repair and supply various spares required time to time. The tenderer will clearly spell out in the offer, the facilities such as Servicing organizations, trained staff, machine spares, consumables, etc. available with him or his representative for providing adequate after sales service anywhere in India during warranty and post warranty periods.												
20.	Important Notes	a) Bidders are required to provide clause-wise comments on the technical specification for confirming the compliance. Comments should be specific												

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		<p>and to the point. They should provide specific information wherever asked for. Deviations, if any, should be clearly indicated with details and proper justification to avoid back reference.</p> <p>b) Offers are likely to be ignored in case of non-compliance of these instructions for furnishing the information.</p> <p>c) The bidders will quote only for the make of sub-assemblies and equipment's wherever specified. Other makes of sub-systems will not normally 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. The alternative makes may be accepted only if found suitable.</p> <p>d) Tenderers must offer and quote the price of all the concomitant accessories/standard accessories specified, as these are considered essential for commissioning and utilization of the machine. Offers received deficient of price of any of the concomitant accessories specified will be considered as incomplete and liable to be rejected.</p> <p>e) Unless stated otherwise, latest alteration/revisions of specification/ standards/ drawings shall be applicable. In respect of safety standards and environmental standards relevant to the equipment. It is mandatory for the equipment manufacturer to ensure compliance with international (CE/ISO/DIN/JIS)/ National standards (IS) (Wherever applicable in their offer).</p> <p>f) Relevant clauses of tender documents must be indicated against every comment/statement of the offer. In case any item is required in sets, nos./pieces per set must be specified. This is essential for proper evaluation of the offer.</p> <p>g) The offer should contain detailed quotation for all spares and consumables required for entire warranty period i.e. 2 years from date of commissioning.</p>
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