



**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY**  
**MATERIALS MANAGEMENT DIVISION**  
**Powai, Mumbai 400076**

**Purchase Requisition No. 1000010771 (SRM/RFX No. 6100000147)**

<b>Technical Specification for Energy Dispersive X-Ray Fluorescence</b>		
<b>Sr No.</b>	<b>Parameter / Features</b>	<b>Proposed Specifications/Details</b>
<b>I</b>	<b>Energy Dispersive X-Ray Fluorescence (Specification)</b>	
<b>A</b>	<b>General</b>	
1	<b>Type</b>	Benchtop
2	<b>Electrical requirements</b>	220-240 V, 50 Hz, Single phase (Suitable for Mumbai, India)
3	<b>Substrate</b>	Teflon filter and/or Polycarbonate, can be a powder or Liquid
<b>B</b>	<b>X-ray Generator Tube</b>	
1	Secondary Targets	Rh target (or equivalent in function*)
2	Anode	Rh anode (or equivalent in function*)
3	Elements list	Fluorine to Uranium (or subset)
4	Power	As needed
5	Primary Filters	Greater than 8 filter positions
6	Environment	Vacuum and He (vacuum pump with all relevant accessories, helium cylinder with all required tubings, flow meter, regulator to be supplied along with the instrument)
<b>C</b>	<b>X-Ray Detector</b>	
1	Detector type	The instrument must be equipped with high resolution silicon drift detector(SDD)
2	Detector cooling	Peltier cooling (Thermoelectric cooling) (or equivalent in function)
3	Spectral resolution	High resolution*
<b>D</b>	<b>Sample Handling</b>	
1	Sample types	Should be able to accommodate 47 mm Filter paper samples; Solids, Powders (loose and pressed). Solutions/Slurries and thin films

2	Sampling stage	Sample positions > 8, measurement of samples on 47 mm diameter filters, and Powders.(Please specify for liquid and thin films)
3	Maximum sample size with sample tray removed	Vendor to suggest
4	Helium gas flush	Inbuilt automatic helium, vacuum and atmospheric environments as per instrument functional requirements
<b>E</b>	<b>Software</b>	Compatible for the functions.
<b>F</b>	<b>Other Considerations (As per functional requirements of the instrument)</b>	
1	Analysis Range for Detection	To be specified by the vendor for the range of all the detectable elements including mixed elements as in coal combustion and atmospheric particulate matter
2	Analysis Time	To be specified by the vendor (preferably less than 60 minutes per sample)
3	Window size	To be specified by the vendor
4	Quality Control Support	The instrument should have protocols for performing high accuracy qualitative as well as quantitative analysis of elements/materials in samples using standards and calibration in different ranges.
5	* Minimum Detection Limit	To be specified by the vendor : the range of elements and the concentration levels expected to be resolved for ambient particulate matter
6	Operation environment	Ambient temperatures in Mumbai
7	Installation	Complete installation of the system and checks to be carried out by the vendor.
8	Training	On-site training to be specified by the vendor [Use and operation of the instrument after completion of installation for software training, operation, maintenance, calibration and trouble-shooting].
9	Safety Accessories	Safety accessories for instrument and operations to be included.
10	Warranty	To be specified by the vendor (Service, Labour and Parts etc.)

<b>II</b>	<b>Accessories</b>	Laptop/PC (if not already integrated in the hardware).Should have the capability of external PC/Laptop interface and controls.
<b>III</b>	<b>Other accessories for the operation of the instrument</b>	Vendor to specify as needed for 2 years of operation
<b>IV</b>	<b>AMC</b>	3 years of AMC (Twice in year)
<b>V</b>	<b>Calibration Standards</b>	Calibration Standards to be included for covering atmospheric aerosols and coal ash/emissions contents.

\* Please see row F-5 above