



भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

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CORRIGENDUM – 1

1. It is notified to all the concerned parties that with reference to our Tender No. IITH/5(3)/DSHEE/2017/T188 dated 30.01.2018 for supply of "MULTIFUNCTIONAL HIGH RESOLUTION X-RAY DIFFRACTOMETER (HR-XRD)", the following changes are being made w.r.t. the Tender: -

- (i) **Revised Specifications – As per ANNEXURE (05 pages) to this corrigendum.**
- (ii) **Revised Due Date & Time for Submission of Tenders is as below: -**

	EXISTING	AMENDED AS
Last Date & Time for submission of Tender	20 Feb 2018 by 03.00 pm	27 Feb 2018 by 03.00 pm
Date & Time of Tender Opening	20 Feb 2018 by 03.30 pm	27 Feb 2018 by 03.00 pm

2. If any of you have already submitted your bid prior to issue of this corrigendum you are required to re-submit your bid before the revised Due Date & Time, considering changes in the specifications of the Tender as per this Corrigendum.

3. All other Terms & Conditions of Tender remain completely unchanged.

Yours faithfully,

(V. Venkat Rao)
Joint Registrar

Specifications for Multifunctional High Resolution X-ray Diffractometer (HR-XRD)

Sealed quotations are invited for state of the art Multifunctional High Resolution X-ray Diffractometer system of following applications.

- Powder Diffraction
- Thin Film Diffraction
- Nanomaterials
- Non-ambient X-ray Diffraction (in-situ measurement)

X-ray Generator	<ul style="list-style-type: none"> • Power: 3.0 kW or higher • Max Voltage: 60kV (increment of 1kV) • Max current: 60mA (increment of 1mA) • Working with 220V and 50 Hz • Stability of Generator: ± 0.01 % against ± 10 % mains fluctuation of voltage and current • Fully controllable through XRD software and user can set parameters using software. • Safety: abnormal generator overload detection, leak current breaker, shutter malfunction detection. Options of X-ray power manual and auto start-up/shutdown • Water flow management with safety (Abnormal cooling water flow, pressure and temperature detection). • Connection for cooling system
X-ray Tube	<ul style="list-style-type: none"> • Source: Cu and Co (as optional item) • Focus: Long line and point focus at source with an ability to change focus easily. • Voltage: 50kV or higher. • Current: 60mA or higher. • It should have necessary Ni-Kβ or curved crystal monochromator filter for Cu radiation for fluorescence minimization. • Facility should be available for changing different tubes • Safety: all kind of safety features should be readily available such as insufficient cooling warning, Shutter malfunction warning, protection for voltage fluctuation and high voltage.
Goniometer	<ul style="list-style-type: none"> • The goniometer should be vertically / horizontally mounted and should be theta-theta or theta-two theta type. • All basic as well as application specific modules should be supplied pre-aligned in all 3 axes or automatic motorized alignment and guidance so that no realignment by user is required. • There should be no need for alignment when mounting and demounting of all the accessories. • It should be optical encoder and computer controlled. • Minimum radius 240 mm or higher



	<ul style="list-style-type: none"> • Angular reproducibility: 0.0001 or better. • Two theta movement range: (-5 to 160) two-theta or higher range. Facility for transmission measurement should be available. • Step size (θ_s / θ_D): 0.0001° or better with require attachments. • Goniometer linearity : ± 0.010 for entire two-theta range • Goniometer accuracy : 0.002 or better
X-ray Beam Optics	<ul style="list-style-type: none"> • Geometries: Bragg Brentano (BB) and Parallel Beam (PB) • Easy change of optics without the need of alignment from Bragg-Brentano to Parallel Beam. • Suitable optics for excellent low angle performance • Optics to minimize/eliminate $K_{\alpha 2}$ • Adjustable slits at the incidence side as well as receiving side. The slit widths should be independently as well as continuously varied. • Soller slit and soller collimators • Two bounce incident beam monochomator (Ge220). Required accessories such as symmetric reflection optics, rotation adjuster, parallel slit attachment, soller slit etc. should be quoted with full specification. • Suitable (primary / secondary) monochromatic optics to remove fluorescence background noise generated by transition elements present in metallic and metallic oxide samples to be offered. • The optics must be such that the system has ability to carry out texture, residual stress, thin film X-ray reflectivity, rocking curve analysis, reciprocal space mapping and small angle scattering and Grazing incidence SAXS. • Different optical geometries including primary, secondary and sample stages should be easily exchangeable by the user when switching between various modes.
Detector	<ul style="list-style-type: none"> • High resolution and high speed 1D detector with 0D functionality. • The offered detector should have very high dynamic range ($\geq 10^6$ cps) • Capable of working with samples which generates high fluorescence. • Capable of working for samples having transition element present in metal, alloys and metal oxides. • 2D detector (as optional item) with full specification
Universal standard stage and sample holder	<p>Standard universal stage for analysis of various samples along with attachment base and head.</p> <ul style="list-style-type: none"> • Flat sample stage with 20 numbers of sample holders. • Zero background sample holder (3 no) for small quantity sample. • General purpose sample holder for reflection (at least 5 no) and transmission mode (at least 5 no) of analysis • Sample stage to mount large sized samples and weight 1 kg or