

**DOCUMENT****Open Competitive Bid (OCB)****For**

**Supply and Installation of Equipments  
To the Material Characterization Lab of MME  
Department.  
at the three campuses of  
Rajiv Gandhi University of Knowledge Technologies**

**Proprietary & Confidential**

**RAJIV GANDHI UNIVERSITY OF KNOWLEDGE  
TECHNOLOGIES**

**Ground Floor, Vindhya C4 Building,  
IIIT-H Campus, Gachibowli  
HYDERABAD- 500 032  
Phone: 040-23001830**

**Tender Ref: RGUKT/Proc/MME/MCL/T37/2012**

**Phone: 040-23001830**

**Proprietary & Confidential**

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**News paper advertisement****Tender Notice****RAJIV GANDHI UNIVERSITY OF KNOWLEDGE  
TECHNOLOGIES****Ground Floor, Vindhya C4 Building, IIIT-H campus,  
Gachibowli, HYDERABAD- 500 032****Phone: 040-23001830**

Separate Sealed Tenders are hereby invited from reputed Manufacturers or Authorised dealers for supply and installation of equipments for the following labs of Metallurgy and Materials Engineering Department at the three campuses of RGUKT located at Basar(Adilabad District), Nuzvid(Krishna District) and RK Valley (YSR Kadapa District) of Andhra Pradesh:

- i. Materials Processing Laboratory
- ii. Physical Metallurgy Laboratory
- iii. Corrosion and Environmental Degradation Laboratory
- iv. Materials Characterization Laboratory
- v. Materials Testing Laboratory

**Last date of submission of tender along with EMD as specified in the bid document is on 19.03.2013 before 04.00 pm.**

**Interested parties can collect the Tender document for each laboratory separately from the office of the RGUKT from 09.03.2013 to 19.03.2013 up to 03.00PM against payment of Rs. 1,000/- towards the cost of each Tender document fee (non-refundable) through D.D. drawn from any Nationalized Bank, in favour of "REGISTRAR, RGUKT" payable at Hyderabad. For further details, visit our website [www.rgukt.in](http://www.rgukt.in)**

**Date: 09.03.2013****Sd/-  
Registrar**

**Time schedule of various Short tender related events**

Bid calling date	09.03.2013
Sale of document	From 09.03.2013 to 19.03.2013 up to 03:00 P.M
Pre bid meeting	13.03.2013 at 04.00PM
Bid closing date/time	19.03.2013 at 04:00 P.M.
Technical Bid Opening date/time	19.03.2013 at 04:30 P.M.
Price Bid opening date/time	20.03.2013 at 04:00 P.M.
Bid Document fee	Rs.1,000/-
Contact person	Registrar, RGUKT
Reference No	RGUKT/Proc/MME/MCL/T37/2013

**Note:** Tender documents purchased bidders are only allowed to participate in Pre-Bid meeting.

Registrar,  
RGUKT.

**TENDER FORM****Not transferable**

Reference. No. RGUKT/Proc/MME/MCL/T37/2013 Dated 09.03.2013

**Subject:** Invitation of Tenders for Supply, installation and commissioning of Material Characterization Lab Equipments to the MME Department at three campuses of RGUKT located at Basara (Adilabad Dist), Nuzvid (Krishna Dist) and RK Valley (YSR Kadapa Dist) of Andhra Pradesh.

Last date and time for submission of the TENDER AT RGUKT, Vindhya-C4, IIIT Campus, Gachibowli, HYDERABAD is **19.03.2013 up to 4:00PM**

Dear Sir/Madam,

- A. RGUKT invites sealed tenders comprising technical bid and price bid separately from reputed manufacturers (or) authorized dealers for its three campuses located at Basara (Adilabad Dist), Nuzvid (Krishna Dist) and R K Valley (Kadapa Dist) of Andhra Pradesh.
- B. The Tender form consists of **42 pages of which pages from 7 to 18** are instructions and **page No.33** contains the format for financial bid. The duly completed Technical Bid together with a copy of the bid document (this tender) signed on all pages by the Bidders authorized signatory and the Price Bid should be kept in separate sealed covers. These sealed covers must be submitted in a sealed master envelope super scribed "Tender for Supply, Installation & Commissioning of Material Characterization Lab Equipments to the MME Department at the three campuses of RGUKT. The last date for submission of bid is **19.03.2013 and closing time is 04:00 PM.**
- C. The Sealed Tenders should be deposited in the Tender box kept in the office of Registrar, RGUKT, Hyderabad up to **04:00 P.M. on 19.03.2013.**

For any clarification and further details on the above tender please contact by Telephone No: 040-23001830 or Contact in Person during office hours.

Thanking you

Yours faithfully,

Registrar,  
RGUKT.

**STATEMENT OF IMPORTANT LIMITS/VALUES RELATED TO BID**

<b>Item</b>	<b>Description</b>
EMD	<b>Rs. 1,00,000/- by way of Demand Draft from any Nationalised Bank or by way of irrevocable bank guarantee from any Nationalised Bank only. DD/BG from other than Nationalised Banks will not be accepted.</b>
Bid Validity Period	90 days from the date of opening of Financial bid
EMD Validity Period	90 days from the date of opening of Financial bid
Warranty Period	3 years Comprehensive Warranty
Variation in quantities/number of residents	<b>± 40 %</b>
Period for furnishing performance Security Deposit	Within 10 days from date of receipt of award
Delivery Schedule	Bidder shall deliver the goods in one single lot within 30days from the date of award of the contract.
Performance security value	5% of contract value by way of irrevocable Bank Guarantee from any Nationalised Bank
Performance security validity period	38 months from award of contract ( including 30 days of installation period)
Period for signing the order Acceptance	Within 7 days from date of receipt of notification of award

<b>Payment terms</b>	
On delivery at user site	<p>Payment for goods and services shall be made in Indian rupees as follows.</p> <ol style="list-style-type: none"> <li>1. 80% of payment will be paid after installation, commissioning</li> <li>2. Balance 20% will be paid after 3 months after obtaining the satisfactory certificate from the Director, RGUKT IITs.</li> </ol>
Maximum Liquidated Damages for late deliveries	<p>For delays:- If the supplier fails to deliver any (or) all of the goods or perform the services within the time period specified in the contract the purchaser shall without prejudice to its other remedies under the contract deduct from the contract price as liquidated damages a sum equivalent to 0.25% of the contract value per day until actual delivery or performance up to a maximum deduction of 10% of the delayed goods or services contract price. Once the maximum deduction is reached, the purchaser may consider the termination of the contract duly forfeiting the performance security etc.,</p>



**ELIGIBILITY CRITERIA**

- 5.1. This bid is open to all firms within India who are eligible to do business under relevant Indian laws as in force at the time of bidding, subject to meeting the pre-qualification criterion. They should provide list of customers of previous supply of similar/ same items to IITs, NIT's or Central Universities or any Academic Institute of National repute with contact details. Copies of orders received from the reputed firms on bidding firm need to be submitted.
- 5.2. The bidder should have servicing facility or work shop with in India so the provision of service is possible at a short notice and without incurrance of delay.
- 5.3. The Bidding firm should have minimum turnover as follows:

<b>Bid Value offered against the tender call</b>	<b>Last financial year's business turnover</b>
Up to 25 lakhs	50 lakhs
More than 25 lakhs	3 crore

The bidder should have adequate experience in supply of such materials as required in the tender. Bidder should furnish proof of having supplied such materials as required in the tender in the previous financial year ending 31<sup>st</sup> March 2012 as mentioned above . A certificate indicating the Turn Over value details (in Rupees) of subject material, during the financial year 2011-12 (for the year ending 31.03.2012) from a Firm of Chartered Accountants must be enclosed (in original) as a proof for Turnover. The Turn Over of the subject Material must be separately indicated in the certificate.

- 5.4. The bidder should furnish satisfactory performance certificate from the parties concerned to whom bulk supplies were effected, in case such supplies were made. RGUKT may contact any such parties to elicit details.
- 5.5. Bidder should be registered under VAT Act/CST Act with the relevant State Sales Tax Authorities. He should furnish along with the bid document, the relevant VAT/CST Registration Document and PAN / TAN Card copies.
- 5.6. All bidders shall also include the following information and documents with their tenders ( in the Technical bid cover)
- 5.6.1. Copies of original documents defining the constitution or legal status, place of registration, and principal place of business of the bidding firm/entity; written power of attorney of the signatory of the Bid to commit the Bidder.

- 5.6.2. Machinery/equipment owned by the bidder and number of employees.
  - 5.6.3. Latest Income Tax returns and **VAT/ CST** Returns filed.
  - 5.6.4. List of Present Clientele with contact addresses & telephone numbers.
- 5.7. All the certificates furnished along with technical bids should be attested by a Gazetted Officer, counter signed by bidder along with their seal.

The bidders must submit all relevant documentary evidence to support their claim for eligibility in placing bid. **The tenders received without the above documents will be rejected.**

### Requirement of Material Characterization Lab equipments

Sl. No	Equipment	Qty for three Centers
1	X-RAY DIFFRACTOMETER SYSTEM FOR TEXTURE AND STRESS ANALYSIS	1
2	X-RAY DIFFRACTOMETER SYSTEM FOR THIN FILM ANALYSIS	1
3	X-RAY DIFFRACTOMETER SYSTEM FOR NON-AMBIENT STUDIES ANALYSIS	1

#### 1. X-RAY DIFFRACTOMETER SYSTEM FOR TEXTURE AND STRESS ANALYSIS

##### Scope

- It shall be an X-ray analyzer which can be configured for all diffraction-based material research applications, including
- Powder analysis, including qualitative and quantitative phase analysis, and structure,
- Residual Stress analysis ( Omega and Psi)
- Texture analysis
- SAXS on Thin Films
- High Resolution Thin Film application (Epitaxial Thin Films) ( Reciprocal Space Mapping )

##### Specifications

###### A. System

- Plug and play system with easy switch on/off all components in the beam path
- Alignment free and tool free change-over of optics
- Auto-component recognition, auto-conflict diagnosis and auto-configuration
- Motorized switch-over between Bragg-Brentano and parallel beam geometries for primary and secondary beam-path

###### B. Safety

- System should comply with the requirements of the Machinery Directive 2006/42/EC. In addition, the instrument is in conformity with the EC Directives 2006/95/EC relating to electrical equipment and 2004/108/EC relating to electromagnetic compatibility.
- The maximum radiation level must be significantly below 1 micro-Sievert/h under measurement conditions.
- Radiation Safety Enclosure and Base cabinet must be provided

## C. Goniometer:

- It should be an accurate, high-precision, two-circle vertical goniometer with independent stepper motors and optical encoders for the Theta and 2Theta circles. It should be available in Theta/2Theta and Theta/Theta configurations, all depending on the accessories.
- The accuracy of each peak position is equal or better than  $\pm 0.01^\circ$  2Theta over the whole angular range.
- It shall have variable circle diameter. Angular range:  $360^\circ$ ; Max. Useable angular range:  $-110^\circ$  to  $168^\circ$ , Angular positioning: by stepper motors with optical encoders, Smallest addressable increment:  $0.0001^\circ$ , Maximum angular speed:  $20^\circ/\text{s}$ , and Angular range:  $360^\circ$  (without accessories)

## D. X-ray generator

- Fully integrated rotating anode generator for point, line and micro focus applications
- Source alignment by means of a highly sophisticated 5 degrees-of-freedom stage
- Generator may be provided with a routine for the automatic burn-in of X-ray tubes to facilitate maximum tube lifetime.
- Generator provides a maximum continuous power: 3 kW at High voltage: 20-50 kV, adjustable in steps of 1 kV, Current: 5-60 mA, adjustable in steps of 1 mA, Input power required: 4 kVA (20 A max.)
- Input supply: 220V (-10%) -240V ( $\pm 6\%$ ), 50/60Hz, three-phase

## E. X-ray Tube

- Cu-anode, long fine focus, 2.2 kW, one exit window for line spot and one for spot focus. Focus sizes: 0.04 x 12 mm and 0.4 x 1.2 mm respectively. Ceramic insulation body.
- Easy switch between line and point focus applications.

## F. Polycapillary

- It is an assembly of a huge number of single glass tubes with inner diameters of about  $1\mu\text{m}$ , which are mounted into a metal holder. The individual glass tubes serve as X-ray guides using the effect of total external reflection.
- On the exit side of polycapillary, beam is converted into a pseudo parallel beam.
- Required for high speed and high quality texture measurements or high speed stress or phase identification studies.

## G. Motorized Divergence Slit Assembly

- This slit can be operated in a Theta-coupled mode to keep the irradiated area on the sample surface constant.
- Ni Filter For Cu-K $\beta$  Radiation
- Axial Soller slit -  $2.5^\circ$ ; Plug-in diagonal slit, 1mm, Collimators,

- H. Centric Eulerian Cradle (Vertical)
- I. It shall integrate Chi and Phi rotations and X-Y-Z translations into one sample stage Bulk and powder samples, as well as thin films and wafers may be mounted by simply changing the sample holder. Centric Eulerian Cradle allows short sample-to-detector distances. All axes are motorized so it can be used for positioning as well as scanning.
- J. X-Y mapping and scanning capability may be typically 80mm x 80mm
- K. Multi-position sample holders
- L. Rotatable vacuum chuck for flat samples
- M. Tilt Stage, Motorized Zeta / Xi
- N. Knife Edge Collimator For Rotatable Vacuum Chuck (For reflectometry measurements with the 1/4-circle Eulerian cradle)
- An assembly for alignment of a sample to the center of a vertical Theta-Theta goniometer
- O. Motorized computer-controlled stepper motor driven divergence slit. This slit can be operated in a Theta-coupled mode to keep the irradiated area on the sample surface constant. The length of the illuminated area can be chosen from 1 to 20 mm.
- P. Detector: must be is a 1-dimensional "compound silicon strip" detector for fast X-ray diffraction measurements. They must have very small pixel size, high dynamic range and very small point spread function. To work in Scanning 1-D mode for fast data collection
- Fixed 1-D mode measurements for ultra-fast measurements
  - Fixed 1-D mode measurements and turned by 90° for ultra-fast non-coplanar measurements
  - 0-D ("point detector") mode for high-resolution parallel-beam geometry
  - 0-D mode and turned by 90° to cover an extremely large dynamic range
  - Active window: 14.4 mm x 16 mm (scattering plane x axial direction)
- Q. PC, Windows 8 OS With Color Deskjet Printer
- R. Diffractometer software : Modules that
- Provide convenient control and navigation center for diffractometer
  - Manage the interactive as well as background measurements and displays of all status information of the diffractometer.
  - Participate in true plug & play X-ray diffraction analysis
  - Provide a job controller with build-in scheduler and history. Jobs can be stopped, deleted, resumed, restarted and prioritized.
  - Keeps a comprehensive log of all instrument events
- S. Interface for easy, fast and convenient X-ray powder diffraction data evaluation and presentation. Data evaluation options can be:

- Peak search and creation of peak data, e.g. for phase identification
- Manual and fully automatic background subtraction
- Data smoothing (Savitzky-Golay method or Fourier filtering)
- K $\alpha$ 2-stripping (Rachinger method)
- 2 $\theta$ -offset and sample displacement corrections
- Calculation of profile parameters such as line position, center of gravity, integrated area, half width and more
- Crystallite size determination (Scherrer method)
- Addition, subtraction, scaling, normalization and merging of scans
- Simultaneous evaluation of multiple scans
- Undo / redo operations
- Support of variable counting time data

T. Thin Film, Stress and Nanoparticle Analysis Software Package

- (Vendor must provide a full description of the functionality)

U. Software for Phase identification and quantitative analysis

- (Vendor must provide a full description of the functionality)

V. Software modules for texture analysis including data retrieval, computation, processing, and presentation of texture results, and handling of databases

- (Vendor must provide a full description of the functionality)

W. Essential and recommended Spare parts for three years of trouble-free operation must be included in the quote.

X. Installation, Training and Support

- Installation shall be performed at user site by the trained service engineer/representative from manufacturer. Qualified personnel shall train the user's representatives on working, set up of the electrical and mechanical, coolant subsystems, mounting, un-mounting of fixtures, furnace and other accessories, controllers, any adjustments there of, safety procedures and system interlocks, and detailed usage of software, testing procedures, creating the templates for modified test procedures, on test data handling, and report generation.

Y. User list: Vendors should have supplied these advanced systems to reputed laboratories/ Institution of National Importance in India and the user list needs to be provided.

Z. Compliance: Vendors must provide a compliance statement (point wise) along with the quote.

A1. Freight & Insurance – The applicable freight on-board, insurance and the delivery charges to Hyderabad Airport shall be clearly indicated. Indicate separately the cost for CIP & CIF (ICD) 1., Hyderabad

B1. The quote for the system shall include a three year period of Comprehensive warranty from the date of installation.

C1. All components, both hardware and software, required for establishing the full functionality as outlined in the scope must be quoted. Bids of systems with hidden features, requirements, limitations or components that are not quoted are liable for rejection.

## 2. X-RAY DIFFRACTOMETER SYSTEM FOR THIN FILM ANALYSES

### Scope

It shall be an X-ray analyzer which can be configured for diffraction-based material research applications, including

- (1) Powder analysis, including phase identification, qualitative and quantitative phase analysis, and crystal structure analysis, (Reflection mode)
- (2) X-ray Reflectometry and thin film analysis
- (3) Grazing incidence diffraction (in-plane GID),
- (4) Small angle x-ray scattering studies by capillary technique

### System

1. Plug and play system with easy switch on/off all components in the beam path
2. Alignment free and tool free change-over of optics
3. Auto-component recognition, auto-conflict diagnosis and auto-configuration
4. Motorized switch-over between Bragg-Brentano and parallel beam geometries for primary and secondary beam-path

### A. Safety

- System should comply with the requirements of the Machinery Directive 2006/42/EC. In addition, the instrument is in conformity with the EC Directives 2006/95/EC relating to electrical equipment and 2004/108/EC relating to electromagnetic compatibility.
- The maximum radiation level must be significantly below 1 micro-Sievert/h under measurement conditions.
- Radiation Safety Enclosure and Base cabinet must be provided

### B. Goniometer:

Vertical goniometer, Theta/Theta or Theta/2Theta geometry (convertible on-site)

- Measurement circle diameter (depending on accessories): Predefined positions at 500, 560, or 600mm or any intermediate setting
- Angular range: 360° (without accessories)

- Max. useable angular range:  $-110^{\circ}$  to  $168^{\circ}$  (depending on accessories)
- Angular positioning: stepper motors with optical encoders
- Smallest addressable increment:  $0.0001^{\circ}$
- Maximum angular speed:  $20^{\circ}/s$  (depending on accessories)

D. Tube mount adapter:

- Tube mount adapter with optical bench for Bragg-Brentano and Göbel mirror geometries (parallel and focusing beam mirrors) for Cr, Co, and Cu radiation.

E. Spacers, detector mounts, counter balances : As required

F. X-ray generator

- Fully integrated rotating anode generator for point, line and micro-focus applications
- Source alignment by means of a highly sophisticated 5 degrees-of-freedom stage
- Generator may be provided with a routine for the automatic burn-in of X-ray tubes to facilitate maximum tube lifetime.
- Generator provides a maximum continuous power: 3 kW at High voltage: 20-50 kV, adjustable in steps of 1 kV, Current: 5-60 mA, adjustable in steps of 1 mA, Input power required: 4 kVA (20 A max.)
- Input supply: 220V (-10%) -240V ( $\pm 6\%$ ), 50/60Hz, three-phase

G. X-ray Tube

- i. Cu-anode, long fine focus, 2.2 kW, one exit window for line spot and one for spot focus. Focus sizes: 0.04 x 12 mm and 0.4 x 1.2 mm respectively. Ceramic insulation body.
- ii. Easy switch between line and point focus applications.

H. Motorized Divergence Slit Assembly

- Computer-controlled stepper motor driven divergence slit. This slit can be operated in a Theta-coupled mode to keep the irradiated area on the sample surface constant. The length of the illuminated area can be chosen from 1 to 20 mm. This slit can also be operated in a computer-controlled fixed mode with openings from  $0.1^{\circ}$  to  $3.0^{\circ}$ . The mode of operation can be independently chosen from the host computer for each measurement

I. Ni Filter For Cu-K $\beta$  Radiation

J. Gobel mirror

- 60mm graded multilayer optics for Cu radiation, creating a highly parallel incident beam while suppressing white radiation, K $\beta$  radiation, and even sample



fluorescence. The Göbel Mirror is mounted in a sealed housing to prevent any degradation

K. Axial Soller slit - 2.5°; Plug-in diagonal slit, 1mm, Collimators,

L. Rotating sample stage

Rotating sample stage with computer-controlled stepper motor. Angular ranges are 0-168° 2Theta in reflection mode, and -10° to 110° 2Theta in transmission mode, dependent on accessories.

Used to improve particle statistics and for the determination of crystal orientations via Phi scans.

M. Compact XYZ Stage

This is a motorized component for a accurate alignment and/or mapping of a sample in the X-ray beam. The stage provides 25 mm travel for the three directions. The drives can be used for scanning or for alignment purposes.

N. Rotatable vacuum chuck, vacuum pump, and knife edge collimator

O. Capillary stage

- Motorized sample stage for the measurement of capillary samples. The samples can be aligned using the included alignment microscope, which is fixed to the outer goniometer circle. Works with sample rotation device, capillaries made of glass, and knife edge collimators

P. Anti-scatter screen

Q. Motorized Divergence Slit Assembly, Secondary

Motorized computer-controlled stepper motor driven divergence slit. This slit can be operated in a Theta-coupled mode to keep the irradiated area on the sample surface constant. The length of the illuminated area can be chosen from 1 to 20 mm.

R. Optical bench for secondary

S. Detector: must be is a 1-dimensional "compound silicon strip" detector for fast X-ray diffraction measurements. To work in

- Scanning 1-D mode for fast data collection
- Fixed 1-D mode measurements for ultra-fast measurements
- Fixed 1-D mode measurements and turned by 90° for ultra-fast non-coplanar measurements
- 0-D ("point detector") mode for high-resolution parallel-beam geometry
- 0-D mode and turned by 90° to cover an extremely large dynamic range

- Active window: 14.4 mm x 16 mm (scattering plane x axial direction)
- T. PC, Windows 8 OS With Color Deskjet Printer : latest configuration, 24" LED monitor.
- U. Diffractometer software : Modules that
- Provide convenient control and navigation center for diffractometer
  - Manage the interactive as well as background measurements and displays of all status information of the diffractometer.
  - Participate in true plug & play X-ray diffraction analysis
  - Provide a job controller with build-in scheduler and history. Jobs can be stopped, deleted, resumed, restarted and prioritized.
  - Keeps a comprehensive log of all instrument events
- T. Software interface for easy, fast and convenient X-ray powder diffraction data evaluation and presentation, consisting of
- General data evaluation modules
  - Phase identification and quantitative analysis modules
  - Data display and report generation options
    - ICDD and PDF2 databases
 (Supplier must provide a full description of the functionality)
- V. Thin Film Analysis Software Package
- (Supplier must provide a full description of the functionality)
- W. Software that is an interactive graphics-based, non-linear least-squares data analysis program for one-dimensional small angle X-ray scattering data from nano-samples
- (Supplier must provide a full description of the functionality)
- X. Essential and recommended Spare parts for three years of trouble-free operation must be included in the quote.
- Y. Installation, Training and Support
- Installation shall be performed at user site by the trained service engineer/representative from manufacturer. Qualified personnel shall train the user's representatives on working, set up of the electrical and mechanical, coolant subsystems, mounting, un-mounting of fixtures, furnace and other accessories, controllers, any adjustments there of, safety procedures and system interlocks, and detailed usage of software, testing

procedures, creating the templates for modified test procedures, on test data handling, and report generation.

Z. User list: Vendors should have supplied these advanced systems to reputed laboratories/ Institution of National Importance in India and the user list needs to be provided.

A1. Compliance: Vendors must provide a compliance statement (point wise) along with the quote.

B1. Freight & Insurance – The applicable freight on-board, insurance and the delivery charges to Hyderabad Airport shall be clearly indicated. Indicate separately the cost for CIP & CIF (ICD) 1., Hyderabad

C1. The quote for the system shall include a three year period of Comprehensive warranty from the date of installation.

D1. All components, both hardware and software, required for establishing the full functionality as outlined in the scope must be quoted. Bids of systems with hidden features, requirements, limitations or components that are not quoted are liable for rejection.

### **3. X-RAY DIFFRACTOMETER SYSTEM FOR NON-AMBIENT STUDIES**

#### Scope

It shall be an X-ray analyzer which can be configured for diffraction-based material research applications, including

- Powder analysis, including phase identification, qualitative and quantitative phase analysis, and crystal structure analysis under ambient conditions
- Powder diffraction at low temperatures (-180°C to 450°C using cold chamber)
- Powder diffraction studies up to 1450°C on continuous basis, using hot chamber

#### Specifications

##### A. System

5. Plug and play system with easy switch on/off all components in the beam path

- Alignment free and tool free change-over of optics
- Auto-component recognition, auto-conflict diagnosis and auto-

configuration

- Motorized switch-over between Bragg-Brentano and parallel beam geometries for primary and secondary beam-path

#### B. Safety

- System should comply with the requirements of the Machinery Directive 2006/42/EC. In addition, the instrument is in conformity with the EC Directives 2006/95/EC relating to electrical equipment and 2004/108/EC relating to electromagnetic compatibility.
- The maximum radiation level must be significantly below 1 micro-Sievert/h under measurement conditions.
- Radiation Safety Enclosure and Base cabinet must be provided

#### C. Goniometer:

Vertical goniometer, Theta/Theta or Theta/2Theta geometry (convertible on-site)

- Measurement circle diameter (depending on accessories): Predefined positions at 500, 560, or 600 or any intermediate setting
- Angular range: 360° (without accessories)
- Max. useable angular range: -110° to 168° (depending on accessories)
- Angular positioning: stepper motors with optical encoders
- Smallest addressable increment: 0.0001°
- Maximum angular speed: 20°/s (depending on accessories)

D. Spacers, detector mounts, counter balances : As required

#### E. X-ray generator

- Fully integrated rotating anode generator for point, line and micro focus applications
- Source alignment by means of a highly sophisticated 5 degrees-of-freedom stage
- Generator may be provided with a routine for the automatic burn-in of X-ray tubes to facilitate maximum tube lifetime.
- Generator provides a maximum continuous power: 3 kW at High voltage: 20-50 kV, adjustable in steps of 1 kV, Current: 5-60 mA, adjustable in steps of 1 mA, Input power required: 4 kVA (20 A max.)

- Input supply: 220V (-10%) -240V ( $\pm 6\%$ ), 50/60Hz, three-phase

F. X-ray Tube

- a. Cu-anode, long fine focus, 2.2 kW, one exit window for line spot and one for spot focus. Focus sizes: 0.04 x 12 mm and 0.4 x 1.2 mm respectively. Ceramic insulation body.
- b. Easy switch between line and point focus

G. Motorized Divergence Slit Assembly

- Computer-controlled stepper motor driven divergence slit. This slit can be operated in a Theta-coupled mode to keep the irradiated area on the sample surface constant. The length of the illuminated area can be chosen from 1 to 20 mm. This slit can also be operated in a computer-controlled fixed mode with openings from  $0.1^\circ$  to  $3.0^\circ$ . The mode of operation can be independently chosen from the host computer for each measurement

H. Ni Filter For Cu-K $\beta$  Radiation

I. Sample Stage:

Sample stage for mounting flat powder samples should be provided with adequate number of sample holders.

J. Motorized Divergence Slit Assembly, Secondary

Motorized computer-controlled stepper motor driven divergence slit. This slit can be operated in a Theta-coupled mode to keep the irradiated area on the sample surface constant. The length of the illuminated area can be chosen from 1 to 20 mm.

K. Detector:

It must be is a 1-dimensional "compound silicon strip" detector for fast X-ray diffraction measurements. To work in

- Scanning 1-D mode for fast data collection
- Fixed 1-D mode measurements for ultra-fast measurements
- Fixed 1-D mode measurements and turned by  $90^\circ$  for ultra-fast non-coplanar measurements
- 0-D ("point detector") mode for high-resolution parallel-beam geometry
- 0-D mode and turned by  $90^\circ$  to cover an extremely large dynamic range
  - Active window: 14.4 mm x 16 mm (scattering plane x axial direction)

L. PC, Windows 8 OS With Color Deskjet Printer : latest configuration, 24" LED monitor.

M. Non-ambient temperature accessories

- a. Low temperature chamber with control and power unit: Temperature range -180 to 450°C in vacuum and room temperature to 300°C in air. Heating by strip heater, 25 litres dewar vessel for cryo liquid, cooling water supply, vacuum pump. Metallic sample holder in direct contact with strip heater/circulating liquid nitrogen. K type thermocouple. Eurotherm temperature control
- b. High temperature chamber with control and power heater: PtRh metallic sample holder in contact with PtRh strip heater. Eurotherm controller for temperature control of sample. Maximum temperature of use in continuous basis 1450°C. Provided with 2-stage rotary vacuum pump and other accessories.

N. Diffractometer software : Modules that

- Provide convenient control and navigation center for diffractometer
- Manage the interactive as well as background measurements and displays of all status information of the diffractometer.
- Participate in true plug & play X-ray diffraction analysis
- Provide a job controller with build-in scheduler and history. Jobs can be stopped, deleted, resumed, restarted and prioritized.
- Keeps a comprehensive log of all instrument events

O. Software interface for easy, fast and convenient X-ray powder diffraction data evaluation and presentation, consisting of

- General data evaluation modules
- Phase identification and quantitative analysis modules
- Data display and report generation options
- ICDD and PDF2 databases

(Vendor must provide a full description of the functionality)

P. Essential and recommended Spare parts for three years of trouble-free operation must be included in the quote.

Q. Installation, Training and Support

- Installation shall be performed at user site by the trained service

engineer/representative from manufacturer. Qualified personnel shall train the user's representatives on working, set up of the electrical and mechanical, coolant subsystems, mounting, un-mounting of fixtures, furnace and other accessories, controllers, any adjustments there of, safety procedures and system interlocks, and detailed usage of software, testing procedures, creating the templates for modified test procedures, on test data handling, and report generation.

R. Other Accessories:

1. Suitable (cooling rate minimum 6000 kcal/hour) external water chiller for XRD from reputed manufacturer.
  2. Additional Cobalt x-ray tube with ceramic insulation, long fine focus (one line and one point focus) with necessary beta filters.
  3. Rotating sample stage with facility to control the rotation speed through software. The sample stage should be usable for both reflection and transmission measurement.
- S. User list: Vendors should have supplied these advanced systems to reputed laboratories/ Institutions of National Importance in India and the user list needs to be provided.
- T. Compliance: Vendors must provide a compliance statement (point wise) along with the quote.
- U. Freight & Insurance – The applicable freight on-board, insurance and the delivery charges to Hyderabad Airport shall be clearly indicated. Indicate separately the cost for CIF (ICD) Hyderabad
- V. The entire XRD system including Indigenous items must carry a warrantee for 36 months including the X-Ray tube and spares from the date of installation. No additional charges will be paid against the warrantee as asked in the tender. The XRD manufacturer must guarantee that all the warrantee replacement parts should be delivered to our installation site on DDP (Delivery Duty paid) basis. Institute will not pay any customs duty or any other charges during these warrantee replacement
- W. Standard sample for calibration: The NIST standard sample for periodic checking of system alignment to be included in the basic system.
- X. All components, both hardware and software, required for establishing the full functionality as outlined in the scope must be quoted. Bids of systems with hidden features, requirements, limitations or components that are not quoted are liable for rejection.

## 7. General Requirements & Qualification Criteria

- ❖ Bidding Firm offering the product should have ISO 9001 Accreditation certification.
- ❖ Bidding Firm, offering the product, should have supplied similar type of test systems for a several years to government establishments, defense organizations & National higher learning institutions like IITs, IISC etc., in India
- ❖ Bidding Firm offering the product should submit list of supplies made by it, during last two years with complete contact details of the end users such as phone number, fax number, e-mail ID etc. It should submit copies of order placed by such organizations and user certificates for goods of same/similar nature.
- ❖ Bidding Firm offering the Product should have a Local Service Support Facility, preferably in Hyderabad, and should submit address and contact details
- ❖ Bidding Firm should give an Undertaking that, un interrupted service support will be given for a minimum period of 10 years with unbroken availability of spares supply.
- ❖ Bidding Firm should give an undertaking that, the Software upgrades if any, during the warranty period of three year, should be supplied free of charge
- ❖ Bidding Firm should offer pre-dispatch inspection free of charge at their factory premises for 2 users for 3 days and post installation training at our three laboratories in different campuses to 2 users for 5 days.



**NOTE**

**A complete set of bidding documents may be purchased by interested bidders from the RGUKT contact person upon payment of the bid document price which is non-refundable. Payment of bid document price should be by demand draft drawn from any Nationalized Bank only in favour of “Registrar, Rajiv Gandhi University of Knowledge Technologies” and payable at Hyderabad (India).**

- ❖ Tender documents purchased bidders are only allowed to participate in Pre-Bid meeting.**