

Scanning Tunneling Microscope (STM)

General Description

Scanning Tunneling Microscope (STM) is required in the Department of Mechanical Engineering, IIT-Delhi for high precision Non-destructive topographical and local electronic measurements with the capacity of atomic scale manipulation.

The major specifications are listed below.

S.No.	Description	Qty
1.	Scanning tunneling microscope	01

Specifications:

- The STM should work under ambient conditions.
- Variable scan area with different scan ranges:
 - Maximum Scan Area: $2.5\mu\text{m} \times 2.5\mu\text{m}$ (X/Y Res. $< 0.8\text{nm}$)
 - Minimum Scan Area: $\sim 35\text{\AA} - 55\text{\AA}$
 - Tunneling Current range $+5\text{nA}$ to -5nA in steps of 0.1nA
 - Sample Bias Range: $+10\text{V}$ to -10V in steps of $\sim 5\text{mV}$
 - Sample Mounting support of 10mm diameter
- Imaging modes:
 - Constant height
 - Constant current
 - Dynamical Conductance Imaging
- Spectroscopy Modes:
 - IV Spectroscopy in point mode, line mode and grid modes.
 - IZ Spectroscopy
- Slope compensation features (horizontal and vertical) both in hardware and software
- Essential Software features:
 - Dual image windows for scan and retrace display
 - Export obtained images to standard image formats like ASCII, jpg, png etc.
 - X/Y/Z Calibration utilities for the piezo-elements.
 - 3D rendering of STM images
 - Spatial and Fourier image filtering tools like slope correction, Fourier Low Pass Filtering, background, subtraction etc.
 - Image analysis like line profile extraction, measurement of length and angles on the images, localized zooming and roughness display.
- Toolkit (with tools for tip and sample changing, spare sample

- mounting discs, conducting silver paste, tip wire cutters etc.)
- The systems should have a clear instruction manual and 3-5 experiments for pedagogical purposes with samples.
 - Training to be provided to 1-2 personnel.
 - Giving a live demo before the customer will better convince us of the product
 - Suitable Vibration Isolation Platform
 - Toolkit (with tools for tip and sample changing, 8 spare sample mounting discs, conducting silver paste, tip wire cutters)
 - Pre-mounted Samples of sufficient number (Minimum 3)

Mandatory Accessories:

- Pt/Ir and Tungsten Tips (10 each) with 1m extra tungsten wire.

Optional Accessories:

- Tip Etching Tool (for preparation of tungsten tips by chemical etching process)
- Reference Sample Kit (with 10 pre-mounted samples having, HOPG, Bismuth Telluride, 1T-TaS₂ and gold sputtered on mica)

TERMS and CONDITIONS

1. Please submit the **TECHNICAL** and **FINANCIAL** bids in separate sealed envelopes. Please mark the two envelopes clearly as “Technical Bid” and Financial Bid”. Both the sealed envelopes should be sent in a single sealed envelope, with clearly marked as **“Quotation for STM”**. The quote should reach the following address on or before **07th October, 2011, 5.00 p.m.**

**Department of Mechanical Engineering
Attn To: Prof.P.V.Rao
Indian Institute of Technology, Delhi
Hauz Khas, New Delhi- 110016, INDIA**

2. Please quote prices at FOB New Delhi, along with delivery schedules.

3. Attach all the technical literature and a list of similar installations done in India.
4. A minimum of three years comprehensive on site warranty is essential.
5. The payment will be made through an irrevocable letter of credit.
6. The institute reserves the rights to accept/reject any/all quotations without assigning any reasons thereof.
7. Complete set of manuals for the operation and servicing of equipment should be given. All circuit diagrams, other mechanical and electrical schematics must be provided to Main unit, sub systems and accessories
8. Spare set – A complete set of spares and consumables should be supplied for three years of trouble free operation
9. Installation and commissioning: The manufacturer should undertake to install and commission the equipment and all accessories and also demonstrate the performance at site.
10. Clearly specify the installation requirements- such as power, frequency,
11. Environment (Temperature and humidity), stray magnetic fields, acoustics, compressed air with its quality etc.
12. Quote should be valid for at least three months
13. If the item is of proprietary nature, proprietary certificate should be attached.
14. If the bidder is Indian agent, the agency certificate should be enclosed.
15. Please produce **compliance certificate for the specification**.
16. The delivery period should be specifically stated. Ex-stock and earlier delivery may be preferred.