



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

**PR No. 1000016304 (Rfx No. 6100001024)**

**Detailed Technical Specifications for Optical 3D CMM**

This tender includes the purchase of an optical 3D coordinate measurement machine (CMM) that will be used for characterizing 2D and 3D surfaces. The desired specifications of each of the components are given below.

**Notes and essential terms for qualification:**

1. The vendor should provide details of at least five customers from India (at least three from IITs or other government research facilities in the past three years) where a similar system/equipment from the manufacturer has been working successfully. Wherever the system is being used, background checks may be done at the expense of the vendor.
2. The price quote must include the price of the software, required accessories, packing, shipping, taxes, and duties, etc. Educational/research/academic discounts may be applied, if applicable. An authorization letter should be furnished along with the quotation.
3. A compliance statement should be enclosed with the quotation. **Point by point list of the product specifications against what is asked must be provided in the compliance statement to demonstrate that the requirements have been met.**
4. Kindly quote every setup and accessories as per the IIT Bombay's tender specification format with all the supportive brochures, documents, and literature. **In case of incorrect format or insufficient attachment, no clarification will be asked and could be subject to a direct rejection of the bid.**
5. As and when the queries are raised against any technical point, it must be addressed promptly, positively within *seven working days*. In case the response is not received within seven working days, the offer will be rejected on technical grounds.

**Technical Specifications:**

S N.	SPECIFICATIONS/ PART/ACCESSORIES	DESCRIPTION & DETAILS
1.	<b>Mode and method of scanning</b>	Non-contact, optical using focus variation
2.	<b>Measurement parameters</b>	a) 2D and 3D form and surface profiles, surface texture, surface roughness b) Measurement data must also include true color information
3.	<b>Sample type</b>	a) Both rough and highly reflective material

		b) Performance must be demonstrable on samples provided by IIT Bombay to all the shortlisted bidders, and the final technical qualification will be decided after the demonstration and evaluations of results.
4.	<b>Vertical Measurement (Z axis)</b>	a) Travel range of 300 mm or more, motorized b) Minimum measurable height of 10 nm or less c) Maximum measurable height of 60 mm or more d) Resolution of 10 nm or better e) Maximum scanning speed of 3 mm/s or more f) Maximum sample height of 300 mm or more
5.	<b>Lateral Measurements (X-Y axes)</b>	a) Travel range of 300 mm or more in each direction, motorized b) Maximum field of view of 5 mm or more in each direction c) Lateral resolution of 1 micron or better d) Travel speed of 50 mm/s or more e) Maximum sample weight of 20 Kg or more
6.	<b>Maximum measurable slope angle</b>	90 deg or more
7.	<b>Surface roughness</b>	Minimum measurable roughness Ra of 50 nm or less, and Sa of 25 nm or less
8.	<b>Rotation unit</b>	a) 2-axis motorized rotation unit must be included to allow scanning of samples in different orientations b) Axis 1 (rotation) must allow full 360 deg rotation c) Axis 2 (tilt) must allow tilt of -15 deg to 90 deg or more d) The clamping unit should be provided to hold part sizes ranging from 2 mm to 50 mm
9.	<b>Objectives</b>	a) All the objectives that allow measurement range and resolution specified in this table must be provided b) Automatic change of objectives must be possible
10.	<b>Lighting</b>	a) Electronically controllable, high-power, LED, color, co-axial illumination b) Electronically controllable LED ring light
11.	<b>Working environment</b>	a) System monitoring and logging of temperatures and vibrations b) Insensitive to vibrations c) Insensitive to ambient lighting d) Insensitive to temperature changes. The permissible deviation limit of less than 1K per hour. e) Can maintain the required accuracy in ambient temperatures ranging from 20 deg – 28 deg f) Noise-free operation
12.	<b>Operating voltage</b>	100-240 VAC, 50-60 Hz
13.	<b>Vibration isolation</b>	Standard Vibration isolation table or unit and worktable. In

	<b>table:</b>	the absence of a vibration isolation table, the performance of the machine must not be affected by any induced and natural vibration
<b>14.</b>	<b>Software:</b>	<p>a) Compatible software for data acquisition and analysis in a single platform and package with the following capabilities: Autofocus and auto-alignment, automated and user-friendly operations, profile form measurement, volume measurement, step height measurement, surface roughness measurement, surface texture measurement, 2D imaging, edge and contour measurement and analysis, automatic optical stitching capability, comparison with CAD data, export of measurement data in standard file formats, offline processing capability.</p> <p>b) No 3rd party software other than MS Office and OS</p> <p>c) Software Licence Validity: Minimum 19 years and above with free updates when released</p> <p>d) Minimum 5 additional software for analysis</p>
<b>15.</b>	<b>Computer:</b>	Branded and updated PC with Windows 10 operating system, i7 processor, 32 GB RAM, 2 TB hard drive, two flat-panel 27-inch monitors, DVD writer, keyboard, mouse, joystick.
<b>16.</b>	<b>Documentation (Manual, Drawings, if any, and Literature):</b>	Complete set of documentation in hard copy as well as softcopy
<b>17.</b>	<b>Installation and Commissioning:</b>	<p>a) The lead time for the delivery of the equipment should not be more than three months from the date of receipt of the purchase order.</p> <p>b) The instrument to be installed, tested, and commissioned by the manufacturer's qualified engineer/representative at IIT Bombay and performance must be tested on NIST certified standards.</p> <p>c) Trained service engineers in India (preferably in Mumbai) should be available to resolve any technical problems in the future.</p>
<b>18.</b>	<b>Warranty:</b>	Twenty-four months of warranty after successful installation/commissioning and acceptance. Including replacement of parts.
<b>19.</b>	<b>Annual maintenance cost</b>	For the next three years after warranty (must be quoted year-wise manner)
<b>20.</b>	<b>Spares Availability Assurance:</b>	The vendor must confirm the availability for at least ten years of the spare support of the offered system.
<b>21.</b>	<b>Standards: NIST Certified Standards</b>	Certified standards for form, roughness, step height calibration must be supplied
<b>22.</b>	<b>Objectives</b>	Quote all other objectives that can be fitted with the

		machine
<b>23.</b>	<b>Accessories</b>	Quote inclusive of all the accessories of the quoted system
<b>24.</b>	<b>Training and installation</b>	<ul style="list-style-type: none"> <li>a) Installation: Required.</li> <li>b) <b>Minimum of three days of on-site training.</b> Training to operate the instrument must be given to our research scholars free of charge.</li> </ul>