



Department of Mechanical Engineering  
Indian Institute of Technology Madras  
Chennai – 600 036, India

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Department of Mechanical Engineering

Ref: No. IITM/ANIL/19-20/MICROSCOPE

DATE: 13/03/2020

Due Date: 27/03/2020  
Time: 03.00P.M.

**Sub: Quotation Invited for Purchase of "Inverted Metallurgical Microscope" – Reg.**

Dear Sir/Madam,

1. Quotations are invited in duplicate for purchasing **Inverted Metallurgical Microscope** as per specifications enclosed in Annexure.
2. The **quotations are to be in two parts as Technical Bid and as Financial Bid**: The two parts of the offer are to be clearly marked on the envelopes. The two parts of the offer in separate envelopes must be enclosed in the one bigger envelope duly sealed and super scribed with reference number and due date and must be addressed to the undersigned so as to reach him on or before the due date stipulated above.
3. **Fax and Email quotation are not acceptable.**
4. Quotations should be valid for 60 days from the due date and period of delivery required, warranty terms etc. should also be clearly indicated. A minimum of one year warranty is required from the date of commissioning.
5. Imported supplies should be quoted **for CIF Madras.**
6. Local firms to quote for free delivery to this Institute. If quoted for Ex-Godown delivery charges be indicated separately.
7. Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the Quotations, wherever applicable. Samples / machine/ equipment if called for should be submitted / demonstrated at free of charges, and collected back at the supplier's expenses. Compliancy certificate is to be provided indicating conformity to the technical specifications
8. GST/ Custom Duty / ED if applicable and such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. If this is not indicated no such claim will be admitted at any stage. The taxes leviable should take into consideration that we are entitled to have concessional GST applicable to Non-Government Educational Institutions run with no profit motive for which a concession is given. Sales Tax Certificate will be issued at the time of final settlement of the bill.
9. Goods should be supplied carriage paid and insured.
10. Goods shall not be supplied without an official supply order.
11. If the item is under DGS&D Rate contract No. and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the Rate contract price (Please note that we are not Direct Demanding Officers). If so please send copy of the RC.
12. The Guarantee period of the item may be indicated clearly.
13. In case of LC. Payment, 90% of the payment will be made after completion of the supply. The balance 10% of the payment will be made after satisfactory installation of the equipment.
14. IIT Madras is exempt from payment of Excise Duty and is eligible for concessional rate of custom duty. Necessary certificate will be issued on demand. IIT Madras will make necessary arrangements for the clearance of imported goods at the Airport/Seaport. Hence the price should not include the above charges.
15. **Acceptance and Rejection:-** I.I.T. Madras has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.

Dr. Anil Kumar Meena

## TECHNICAL SPECIFICATION FOR INVERTED METALLURGICAL MICROSCOPE

### Essential Features:

- The equipment should have capabilities of imaging metals, non-metals and polymers (e.g. aluminum, magnesium, copper and their alloys, high strength materials such as stainless steels, titanium alloys, super alloys and metal matrix composites etc.)
- The required specifications are tabled as following:

### Technical Specifications:

Sl. No.	Part/Feature	Description
01	Microscope Frame	<ul style="list-style-type: none"> <li>• Microscope Frame for Reflected light illumination with camera port.</li> <li>• Suitable C-Mount adapter to fix the camera.</li> </ul>
02	Focus	<ul style="list-style-type: none"> <li>• Manual, coarse and fine coaxial handle</li> <li>• Focus stroke 9 mm (2 mm above and 7 mm below the stage surface) or better</li> <li>• Fine stroke 100 <math>\mu</math>m / rotation or better</li> <li>• Graduation on Fine Focus 1 <math>\mu</math>m or better</li> <li>• Coarse stroke 7 mm / rotation or better</li> <li>• Pre-focusing limit stopper and torque adjustment on coarse focus</li> </ul>
03	Reflected light illuminator	Suitable for: <ul style="list-style-type: none"> <li>• For BF (Bright Field)/DF (Dark Field)</li> <li>• Single lever switchover for BF/DF observation</li> <li>• Required filter sliders are required to use BF and DF imaging</li> <li>• Manual AS and FS settings</li> <li>• Slot for Polarizer and Analyzer filter slider</li> <li>• LED light source</li> </ul>
04	Observation Tube	<ul style="list-style-type: none"> <li>• Binocular Observation tube, inclination angle: 90° reverse image</li> <li>• Eyepiece Pair: Wide field 10x with F.N 22 or better</li> </ul>
05	Light Source	<ul style="list-style-type: none"> <li>• LED Light source for Reflected light illumination suitable for BF/DF Observation</li> <li>• White LED: 5700K or higher</li> <li>• Average life time: Approx. 50,000 hrs. or better</li> </ul>
06	Revolving nose piece	<ul style="list-style-type: none"> <li>• Revolving nosepiece with slot for DIC suitable for BF/DF</li> </ul>
07	Objectives	<ul style="list-style-type: none"> <li>• M Plan Semi apochromatic grade objective 5X/ aperture 0.15(or better), WD 12mm or higher</li> <li>• M Plan Semi apochromatic grade objective 10X/ aperture 0.3(or better), WD 6.5mm or higher</li> <li>• M Plan Semi apochromatic grade objective 20X/ aperture 0.45(or better), WD 3mm or higher</li> <li>• M Plan Semi apochromatic grade objective 50X/ aperture 0.8 (or better), WD 1mm or higher</li> </ul>

		<ul style="list-style-type: none"> <li>• M Plan Semi-apochromat BD objective 100X/ aperture 0.9 (or better), WD 1mm or higher</li> </ul>
08	<b>Mechanical Stage</b>	<ul style="list-style-type: none"> <li>• Right handle stage</li> <li>• Stage area: 200 (Y) mm x 200(X) mm or higher size</li> <li>• Movable range: 40 (Y) mm x 40(X) mm or higher size</li> </ul>
09	<b>Digital Color Microscope Camera</b>	<ul style="list-style-type: none"> <li>• Single Chip Digital Color Microscope Camera Minimum 5 Mega Pixel CCD</li> <li>• Sensor size – 2/3 Inch color CCD</li> <li>• A/D converter- 12bit</li> <li>• Exposure time - 50 <math>\mu</math>s – 8 s</li> <li>• Min 22 frames per second (for resolution 1920 x 1080, Full HD 16:9)</li> <li>• Min 30 frames per second (for resolution 1224 x 960)</li> <li>• USB3.0 Connectivity</li> </ul>
10	<b>Basic Measurement Software</b>	<ul style="list-style-type: none"> <li>• Software for Basic image acquisition movie acquisition (Avi and MP4 format preferred)</li> <li>• Annotations, layer management, scale bar, cross hair, info stamp display, and image filters should be there</li> <li>• Digital reticle/grid, line profile display should be there</li> <li>• Basic interactive measurement (distance, angles, rectangles, circles, ellipses, polygons, circle-to-circle distance, angle ruler, and line ruler) and data export to MS Excel</li> <li>• Report creation (MS Word, and MS Excel formats)</li> </ul>
11	<b>PC</b>	<ul style="list-style-type: none"> <li>• Dell/HP/Lenovo Intel i5 Processor based System</li> <li>• With 8 GB RAM, 2 GB graphics card, 1 TB HDD</li> <li>• Windows 10, 64bit OS, MS Office 2016</li> <li>• 22" LED Monitor</li> <li>• Keyboard &amp; Mouse</li> </ul>
12	<ul style="list-style-type: none"> <li>a) Grainsize analysis module (intercept method)</li> <li>b) Grainsize analysis module (planimetry method)</li> <li>c) Nonmetallic inclusion rating in steel, worst field method</li> <li>d) Porosity Analysis</li> <li>e) Cast Iron analysis module</li> <li>f) Layer Thickness Measurement module</li> </ul>	
<b>OTHER TERMS and CONDITIONS</b>		
13	<b>Warranty period</b>	12 months from the date of installation/commissioning.
14	<b>Installation</b>	Installation should be done by factory trained engineers at our site, free of charge.
15	<b>GST</b>	Offer should be made @ 5 % GST against concessional GST certificate.
16	<b>Delivery condition</b>	Equipment to be delivered in test ready, factory calibrated condition.
17	<b>Compliance statement</b>	Compliance statement needs to be provided clearly specifying COMPLY/NON-COMPLY with remarks of all of the points mentioned above.

**The quotes should be addressed to:**

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