



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

PR No. 1000031547 Rfx No. 6100001351

Detailed Technical Specifications of POLARIZING MICROSCOPE:

1. Type: Upright type with infinity corrected optical system
2. Stand: Y – shaped, providing wider work surface, shall ensure smooth & efficient operation with less operator fatigue, even over extended use. Should incorporate a vertical position built-in transformer. Shall permit convenient placement of samples as well as ancillary equipment near the stand. Electrical control including intensity control, light preset switch shall be frame mounted.
3. Illumination: Built-in Reflected and transmitted long life LED illumination.
4. Observation: Orthoscopic & Conoscopic
5. Magnification: 50X upto 1000X
6. Observation Tube: Siedentopf type wide field trinocular tube with tube inclination 30 degrees & interpupillary distance adjustment from 50 to 76 mm.
7. Analyser: 360 deg. dial rotatable . Rotatable min. angle 0.1 deg.
8. Focusing: High sensitive focusing knob in 1 μ m increment, focusing stroke 25 mm. Shall accommodate specimen size up to 65 mm height.
9. Optical System: Shall incorporate universal infinity system for infinity correction compensates for chromatic aberrations, spherical aberration and wave-front aberration control so that no change of magnification occur when the distance between tube lens & object is changed, total magnification shall remain constant even when prism and or slider are inserted between object & tube lens.
10. Mechanical Stage: Polarizing rotatable stage with 3-point centering function 360 deg. rotatable, lockable in any position, 360 deg. graduated in 1 deg. increments. Provision for slide holder & mechanical stage attachment.

11. Revolving Nosepiece: Revolving Sextuple Nosepiece for attachable components. $\frac{1}{4}$ wavelength retardation plate, tint plate & provision to attach various compensators using adapter.
12. Condenser: Achromat strain free condenser, 360 deg. rotatable polarizer with swing out achromatic top lens, click stop at position 0 deg. is adjustable. N.A. 0.9 (top lens in), N. A. 0.18 (top lens out)
13. Eye Piece: Wide field eye piece 10x, with suitable provision for inserting eyepiece reticules
14. **Digital Photomicrography:** Microscope Digital camera for photo-micrography, shall be custom built suitable for use with microscope. System should have the camera head connected to Microscope frame using C-Mount adaptor. Quality class performance of camera with color fidelity. Outstanding color fidelity by patented online color transformation.
 - I. DP28-CU MICROSCOPE DIGITAL CAMERA, 8.9MP
 - II. 8.9MP (4K) non-cooled color digital camera for microscope
 - III. Sensor size and type: 1 in. Color CMOS
 - IV. Pixel size: 3.45 x 3.45
 - V. Exposure time: 27 μ s–15 s
 - VI. Dynamic range*1: 10 bit
 - VII. Live Frame rates: 64 to 32
 - VIII. Dimensions ($\varnothing \times H$): 76.7 mm \times 37.3 mm (3 in. \times 1.5 in.)
 - IX. USB 3.1 data transfer
15. **Image Analysis Software** - Modular image capture and processing software for microscopy applications with focus on acquisition, measurement and reporting (runs with Windows 10-64 bit). System should have provision for up-gradation of features as & when required using add-on modules to existing software.
16. Acquisition, display and enhancement - Integrated drivers for many cameras and analog converters; support for multiple input channels with autonomous calibration, magnification lists and control of automatic microscopes; zoom feature for fast and easy location of subtle details within large images; non-destructive overlay functions for labeling/annotating within images; dual-screen configuration supported. Movie recording and software autofocus of built in Z drives available for conducting dynamic experiments. Complete set of filters for image enhancement including edge detection, smoothing filters

17. Evaluate, report and communicate - Display, evaluation and classification of results in sheets. Word Report Composer function for advanced report integration into Microsoft Word (Win10). Allow the user to select a document template (defined in word, containing headers and footers) and a page template (arrangement of the placeholders for easy integration of any document produced in Stream). Templates are user definable directly in Microsoft Word with the integrated Olympus toolbar. The user will be able to zoom, scale and pan for the correct area into Microsoft Word
18. Measuring and dimensioning - Special measurement environment suited to interactive measurement tasks and dimensioning. The following types of measurement are supported: point, quantity, linear, open polygons and angles; measurements of enclosed areas such as circles, ellipses, rectangles and polygons. Extended Focal Imaging (EFI).
19. Criteria available for selection include the following: length, angle, point, number of points, area, perimeter, diameter, shape, etc. All objects measured are shown in a spreadsheet in the order they were measured. Via online statistics, measurement results can be directly screened with regard to mean values, extremes or standard deviation.
20. **Image Processing:** Integrated advanced image processing functions. Image arithmetic and logical operations between images are made easy. Phase and Class analysis on image with emphasize on morphological behavior. Easy selection of Region Of Interest (ROI) for a better result. Macro recording for easy creation of repeatable processing.
21. **Data management:** Management of various documents such as images, reports, sheets and external files. Support Microsoft SQL Server 2005 Express with a maximum size of 4 Gb for the database tables. Workflow oriented user interface with live view. No user right management for added usability in small units (maximum of 5 simultaneous users).
22. **Expandable:** expandable by use of brand-new set of Solutions, including most common material science applications as in future
23. **Warranty:** Instrument should be supplied with 2 years warranty