



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
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PR No. 1000026630 (Rfx No. 6100001249)

Detailed Technical Specifications for Fluorescence microscope:

1. **Inverted fluorescence microscope required** with live cell imaging.
2. **Microscope body:** Should have water proof structure, with infinity corrected optical system. The body should be upgradable to motorization and DIC in future. System should have minimum 3 ports with trinocular head.
3. **Nosepiece:** Sextuple coded revolving nosepiece to accommodate six objectives at a time.
4. **Illumination of microscope:** LED Illumination with life of 20,000 hours
5. **Required objectives (Long working distance):**
 - Semi apochromat 4X (NA 0.13 WD 17, or better)
 - Semi apochromat 10X (NA 0.3 WD 10, or better) **Phase objective**
 - Semi apochromat 20X (NA 0.5 WD 2.1 or better),
 - Semi apochromat 40X (NA 0.75 WD 0.51 or better) **Phase objective**
 - Semi apochromat 60X Oil (NA 1.25 WD 0.12, or better),
 - Semi Apochromat 100X Oil (NA 1.3 WD 0.2, or better)
6. **Eyepieces:** Widefield Binocular observation tube with anti-fungus type 10X F.O.V 22 or better and diopre adjustment facility on both eyes
7. **Focussing System:** Should have external coaxial course and fine focusing knob with the option to upgrade to motorised z focus
8. **Condenser:** Long working distance universal condenser NA 0.55, W.D. 27mm or better, positions available for optical devices such as Phase and DIC
9. **Stage:** travelling range 120mm an 85 mm (XY) applied for slide glass, 35mm dish as well as multi well plate. Sample holder for slide glass, 35mm dish. Stage stopper function is implemented for time-lapse or operation on stage
10. **Required filters and turret:**
 - Coded Epi fluorescence turret with built in shutter should accommodate 7-10 filter cubes. The epi fluorescence turret should have sensor through which the software can read and recall the position, and calibrate values for each fluorescence filter cube.
 - 100-watt Mercury arc lamp with Power supply

- **NARROW** Band pass filters for DAPI, FITC/EGFP, TRITC.
- **Narrow band Filter Blue** with excitation filter 470-495 or lower, dichroic beam splitter and barrier filter 510-550 or lower.
- **Narrow band UV excitation**, exciter filter 330-385 or lower, dichroic beam splitter, barrier filter 420
- **Narrow band Green excitation**, with exciter filter 530-550 or lower, dichroic beam splitter and barrier filter 575.

11. Video camera:

- resolution 4k (8.9 MP), speed 32 frames/second.
- can provide up to 64 fps full HD live images,
- Sensor 1-inch Color CMOS, Pixel size $3.45\ \mu\text{m} \times 3.45\ \mu\text{m}$,
- Exposure mode Manual, Auto, Exposure
- spot size 64 fps (sub-sampling 2×2 —high sensitivity)
- Auto exposure: 30 μs –10 s or better, 4104×2174 (full resolution), 3840×2160 (4K)

12. Software for camera in CD/dongle required:

- Should act as an interface between the digital camera and the computer system.
- Acquisition & device control, Filters for Image enhancement, Background & dark field correction, Time lapse acquisition, Manual object counting, Region & Line measurements
- Multiple undo/redo options, Time Lapse imaging, Multi-channel imaging with merging and extraction of fluorescence channels
- Touch count/Object Count Facility to count objects, make several classes and name them and export to excel files or workbooks.
- Channel Merging and extraction, Time-lapse imaging at specified interval
- Software should be compatible with any “Windows version”.
- Also, compatible with open source software like imageJ /video grab.