



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

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Detailed Technical Specifications for Digital processing confocal scanning violet laser microscope with ultra-high temperature infrared heating furnace system

Heating requirement:

1. Temperature range: room temperature – 1700°C
2. Heating rate: up to 50°C/sec
3. Cooling rate: up to 100°C/sec
4. Infrared furnace + observation system: high temperature infrared heating observation system (infrared heating furnace, programmable temperature controller, flicker inhibition cold filter, vacuum valve, check valve, etc.), should include a halogen lamp cooling system along with necessary valves.

Infrared furnace atmosphere control inside the furnace:

1. Can sustain 10^{-2} Pa vacuum level
2. Ability to control gas atmosphere: air, oxidizing, reducing and inert.

Laser Microscope:

1. Digital confocal scanning violet laser ($\lambda = 405$ nm) microscope
2. Resolution of 0.5 μm at the highest temperature, 0.15 μm at room temperature
3. Method: horizontal: acoustic optical deflector, Vertical: Galvano mirror
4. 15 Hz/1024 x 1024 pixel, 30 Hz 1024x512 pixel, 60 Hz/1024 x 256 pixel.

Software requirement:

1. Temperature control and P.I.D setting, image and data recording software
2. Image analysis software
3. PC with required capabilities

Accessories requirement:

1. Optical microscope with motorized X-Y stage.
2. Objective lenses for high temperature observation: 5x,
3. Objective lenses for high temperature observation 10x,
4. Objective lenses for high temperature observation 20x,
5. Objective lenses for high temperature observation 50x
6. Vacuum unit: oil-sealed rotary pump with auto-leak valve
7. Tube furnace getter: tube furnace, temperature controller and stand
8. Water chilling circulator for cooling
9. Vibration isolator: manual level table-top vibration isolator
10. Power transformers (2 units): 220-240 V → 100V 1.5kVA,
11. Infrared halogen lamp: 1.5 kW – 100V
12. Sample holder: R-type T/C, max. 1700°C.
13. Sample holder: PR20-40-type T/C, max 1800°C
14. Crucible (20 units): 6.5 mm diameter alumina crucible
15. Crucible (10 units): 9 mm diameter alumina crucible
16. Crucible (2 units): 5 mm diameter Pt for slag and inorganic material
17. Upper view window quartz plate
18. Partition quartz plate
19. Packing and o-ring set
- 20. It should include a warranty of five years.**

Additional notes:

- 1. The vendor must have successfully delivered the equipment meeting all of the above specifications to organizations within/outside India. To this end, quote should include details pertaining to installations in previous 5 years along with customer feedback.**