



STANDARD OPERATING PROCEDURE

Department: Microbiology	SOP No.:
Title: Operation and Cleaning of Microscope	Effective Date:
Supersedes: Nil	Review Date:
Issue Date:	Page No.:

1 Purpose: The purpose of this SOP (Standard Operating Procedure) is to describe Operation and cleaning procedure for Microscope.

2 Scope: This SOP is applicable to Microscope, ID number, make: kept in the microbiology section.

3 Reference, Attachments and Annexures:

3.1 Reference:

3.1.1 Instruction Manual supplied by manufacturer

3.2 Attachments:

3.2.1 Attachment-1: Instrument History Card

3.3 Annexures: None

4 Responsibility

4.1 Microbiologist:

4.1.1 To perform the activity as per SOP

4.1.2 To maintain the records as per SOP

4.2 QC Head or designee:

4.2.1 To check the SOP

4.2.2 To give the training to all concern persons

4.3 Quality Assurance :

4.3.1 To check the SOP

4.3.2 To ensure the proper implementation of SOP

4.4 Regulatory Affairs, Quality Head, Plant Head:

4.4.1 To review and approve the SOP

5 Distribution

5.1 Quality Assurance (QA) Department

5.2 Quality control Department (Microbiology Section)

6 Abbreviations & Definition of Terms :

6.1 **Abbreviations:** None

6.2 **Definition of Terms :**None

7. Procedure

7.1. Precautions: (Before Use)

7.1.1. Microscope is a precision instrument so always handle it with care and avoid abrupt motions or shocks.

7.1.2. Avoid exposure to direct sunlight, high temperature, humidity, dust and vibration.

7.1.3. Before bulb or fuse replacement, unplug the power cord from the main switch.

7.1.4. Always ground the microscope to prevent electric hazard.



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- 7.1.5. Only use the tension adjustment ring for altering the tension of the coarse adjustment knobs.
- 7.1.6. Do not touch optical surface when unpacking or during use the microscope to avoid fingerprints.
- 7.1.7. Be careful not to soil lens surfaces with dust.

7.2. Start Up:

- 7.2.1. Remove the plug-in power unit from its storage on the back wall of the microscope. Replace the installed power outlet adapter by one of the supplied adapters if necessary. To this pull off the attached adapter and plug on the desired adapter.
- 7.2.2. Connect the plug- in power unit to a power outlet.
- 7.2.3. Turn on the microscope with rotatory switch and adjust the illumination to the desired intensity which is indicated in five steps by blue light-emitting diodes.
- 7.2.4. Objectives mounted on the nose piece ensuring proper centering and parfocality of ach objective.
- 7.2.5. Light source perfectly aligned for optimum light intensity and collimation.
- 7.2.6. Binocular Head, it is packed separately to ensure no damage occurs during transit.
- 7.2.7. Insert the eyepiece into eyepiece tube.
- 7.2.8. Plug the power cord into the receptacle on the microscope base.

7.3. Operational Procedure:

- 7.3.1. Make sure all exposed optical surfaces are free of dirt.
- 7.3.2. Adjust the observation head to convenient working position.
- 7.3.3. Swing the eyepiece tubes symmetrically or away from one another to adjust the distance between the tubes to your individual interpupillary distance.
- 7.3.4. The eyepiece pointer can be inserted in one eyepiece, when required.
- 7.3.5. For adjusting transmitted-light bright field on the microscope, First, place a contrasty specimen slide with the suitable cover slip being on top in specimen holder of mechanical stage. Fix the slide by means of the spring lever.
- 7.3.6. Rotate the nose piece until the lowest power objective is in the viewing position. The lower the power of the objective, the greater the field of view. Lower power objectives also have a much greater depth of focus and are generally used for initial focusing and viewing.
- 7.3.7. Move the abbe condenser up to the top mechanical stop by turning knurled knob, and set the control lever of the aperture diaphragm to the mid position.
- 7.3.8. Take down the stage to a fairly low position with help of the coarse focus knob.
- 7.3.9. Make sure the stage surface is free of dust, grit or any other material that will interfere with the movement of the specimen slide across the surface of the stage. Position the specimen area of the slide over the center of the stage aperture.
- 7.3.10. On the binocular tube first look through one eyepiece and turn the focusing drive to focus on the specimen. Then, readjust the focus for other eye, if necessary, by turning the eye lens of the focusing eyepieces.
- 7.3.11. Close the luminous-field diaphragm until it becomes visible in the field of view.



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- 7.3.12. Center the image of the luminous-field diaphragm using both centering screw of the condenser. Then open the diaphragm until it just disappear from the field of view.
- 7.3.13. Looking through the Observation Head, raise the stage by adjusting the coarse focus knob until the image appears. Focus as sharply as possible with coarse focus knob.
- 7.3.14. Adjust the fine focus knob to sharpen the image in the center of the field of the view.
- 7.3.15. Look at the image and adjust the diaphragm aperture to obtain the clearest possible image. The clarity of the image depends upon the size of the aperture. As the aperture become smaller, the contrast and the depth of focus increases but the resolving power decreases. The clearest image is produced by the communication of these three factors.
- 7.3.16. For getting a higher magnification, move the slide show that the feature gets centered in the field of view.
- 7.3.17. The microscope has a rotary potentiometer with a electronic voltage regulator for regulating the light intensity. Rotate the potentiometer from low to high as go from low magnification to high magnification objectives for obtaining best light in the field of view.
- 7.3.18. The procedure for examining a specimen using the oil immersion objectives is as follows:
 - 7.3.18.1. Rotate the nose piece so the lowest power objective is in the light path.
 - 7.3.18.2. Place one drop of immersion oil on the lighted area of the specimen slide. Dust or air bubbles in the oil can destroy the definition of the image. If the bubbles are trapped between the objective lens and the slide, clean off the oil and start again. Keep the oil tightly stopper and don't shake the bottle.
 - 7.3.18.3. Rotate the nose piece so that 100x oil immersion objective is in the light path.
 - 7.3.18.4. Use coarse focus knob to raise the stage with specimen cover glass. When a flash of light seen at the location, the objective lens has made contact with the immersion oil and the microscope can be focused using the fine focus knob.
 - 7.3.18.5. After finishing of use of oil immersion objective, wipe off all traces of oil from the objective and the specimen cover glass with a lens tissue or clean soft cloth.

7.4. Cleaning:

7.4.1. Cleaning of optical surface:

- 7.4.1.1. To clean exposed lens surfaces of the dust particles that settled, first blow off the dust using the air stream from the rubber air bulb.
- 7.4.1.2. Only the removing finger masks or any other greasy substances should soft cotton cloth, lens tissue or gauze, lightly moistened with absolute alcohol be used
- 7.4.1.3. For cleaning the 100x oil immersion objectives only use Xylene.

7.4.2. Cleaning the body parts:

- 7.4.2.1. Clean accumulated dirt from the body surfaces with a damp cloth. If dirt persists, use a mild soap solution on the cloth. Avoid use of any organic solvent e.g. Thinner, Ether, Alcohol etc.

