



DEPARTMENT OF MECHANICAL ENGINEERING
17MECC84 – METALLURGY LAB (UG)
STANDARD OPERATING PROCEDURE

| | |
|----------------------------------|--|
| Name of the Lab./facility | METALLURGY LAB |
| Purpose | To provide the basic knowledge about the physical metallurgy in general and metallography in specific. To train the students on analyzing the metallographic effects of Heat Treatment processes. |
| Scope | Practicing the methodologies for preparing the specimens of ferrous and non-ferrous materials. Experimental training on identifying ferrous and non-ferrous material specimens through Metallurgical microscope. Experimental training on different types of heat treatment methods for engineering materials. |
| Responsibility | Lab In-charge |

**STANDARD OPERATING PROCEDURE FOR
METALLURGICAL MICROSCOPES**

- Turn on microscope lamp power by rotating the knob clockwise of the base to the ON position.
- Place sample onto stage.
- Verify magnification in use.
- Adjust the distance between the stage and the objective by turning the stage height adjustment knob.
- Adjust the eyepiece by folding the two view pieces together or spreading them apart to match your eye spacing. When set correctly the user will see one round, focused field of view when viewing the sample.
- After viewing the image, remove the sample from the stage and store in respective place.
- Set the microscope's POWER SWITCH to the off position.
- Experimental procedure to be followed as given in the manual.

Precaution: Always be aware of the sample's position in relation to the objective. Crashing the stage into the objective will result in damage to the instrument.

Record to be maintained:

- Laboratory Manual containing the experiments that can be performed with the equipment.
- Students' Observation Note book and Record.

Wathu L

HOD/MECH



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STANDARD OPERATING PROCEDURE FOR FURNACES

- Place the sample inside the furnace. Never place the sample directly in BARE HANDS. USE GLOVES AND TONGS.
- All furnaces have the maximum temperature for regular/daily operation. Do not exceed the maximum temperature, otherwise the heating elements are damaged. For the furnace without time controller, set target temperature to heat up furnace.
- After the stipulated duration, remove the sample.
- Quench the sample as per the experimental requirement.
- Experimental procedure to be followed as given in the manual.

Precaution:

- Always be cautioned while keeping and removing the specimen.
- Be aware of the melting point of the specimen and set the temperature.

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**STANDARD OPERATING PROCEDURE FOR ROCKWELL
HARDNESS TESTING MACHINE**

- Mount the sample so it is flat on the stage.
 - For select appropriate load and indenter (see the table on machine).
 - Rotate Hand Wheel clockwise to move sample into indenter.
 - Continue to turn wheel slowly to apply the initial test load.
 - Turn rotating wheel counter-clockwise to lower the sample. Move the sample to the second test location.
- NOTE: The first measurement is done to set the indenter and is not included in the data.
- Record the observation.
 - Experimental procedure to be followed as given in the manual.

Precaution: Always be aware that the sample is flat.

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| STANDARD OPERATING PROCEDURE FOR DOUBLE DISC POLISHING MACHINE | |
| <ul style="list-style-type: none"> • Switch on the machine by rotating the knob clockwise. • Hold the specimen upright on the velvette/durocloth disc firmly. • Ensure the amount of water lubricant and alumina paste for better polishing. • After polishing, rotate the knob anticlockwise for switch off position. • Experimental procedure to be followed as given in the manual <p>Precaution:</p> <ul style="list-style-type: none"> • Always be cautioned while keeping and removing the specimen. • Avoid wearing bracelets and other ornaments in hand while working in the machine. <p>Record to be maintained:</p> <ul style="list-style-type: none"> • Laboratory Manual containing the experiments that can be performed with the equipment. • Students' Observation Note book and Record. | |

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