

Maharashtra Institute of Technology, Aurangabad
Department of Plastics and Polymer Engineering
LABORATORY MANUAL

Academic Year: 2019-20 Part: II Course: Polymer Processing Technology
Course Coordinator: Dr. Prashant Gupta

MASTER LIST OF EXPERIMENTS

SUBJECT-: Polymer Processing Technology

Class: TYPPE

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EXPERIMENT NO. 1

Aim: To produce an article from hand operated injection moulding machine.

Apparatus: Hand operated injection moulding machine, hand gloves, raw materials.

Theory:

- 1. Injection Molding:**
- 2. Construction & Working:**
- 3. Neat labeled sketch of machine showing all important parts:**

Procedure:

1. Start up the heating to the machine barrel.
2. Align the mould perfectly and clamp it tightly.
3. Charge raw material into the hopper.
4. By using handle, apply injection pressure.
5. Hold on for few seconds.
6. Release the handle.
7. Provide adequate cooling to the mold.
8. Eject the article.
9. Report the product and cycle time.
- 10.

Result: The cycle time for the “Dumbell sample” product is seconds.

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EXPERIMENT NO. 2

AIM: To produce an article from reciprocating screw type injection moulding machine.

Apparatus: reciprocating injection moulding machine, hand gloves, raw materials

THEORY:

- 1. Injection Molding:**
- 2. Construction & Working:**
- 3. Neat labeled sketch of machine showing all important parts:**

Procedure:

1. Switch ON the heaters.
2. After attaining the temperature, feed the raw material to the hopper.
3. On control panel, do the settings for injection pressure, hold on, clamping system and all other necessary settings.
4. Start the machine manually and take the carriage forward.
5. Apply injection pressure to the material for injection phase.
6. Hold on for few seconds.
7. Take the carriage backward and do the refilling for next shot.
8. Allow the mold for cooling.
9. Open the mold and eject the article.

Result: The cycle time for the “.....” product is seconds and the product weight is grams.

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EXPERIMENT NO. 3

Aim: To produce granules / products from extrusion moulding machine.

Apparatus: Laboratory extruder, pelletizer, raw materials hand gloves, water tank.

THEORY:

- 1. Extrusion Molding:**
- 2. Construction & Working:**
- 3. Neat labeled sketch of machine showing all important parts:**

Procedure:

1. Switch ON the heaters.
2. After attaining the temperature, feed the raw material to hopper.
3. Start the screw rotation.
4. Collect the output coming from die side.
5. Try to collect both the threads, run through water trough and feed to the pelletizer.
6. Collect the granules form output of pelletizer.
7. Calculate the output rate of extruder.

Result: The output rate of the extruder while making pellets is kg/hr.

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EXPERIMENT NO. 4

Aim: To produce an article from blow moulding machine.

Apparatus: Blow molding machine, hand gloves, blow mold, raw material/parison etc.

Theory:

- 1. Blow Molding:**
- 2. Construction & Working:**
- 3. Neat labeled sketch of machine showing all important parts:**

Procedure:

1. Switch ON the heaters.
2. Align the mold properly with nozzle and keep it opened.
3. Feed the blow grade raw material to the hopper.
4. Now start manually injecting the material to form the parison in open mold.
5. Guide this hollow parison till the end of the mold height.
6. Now stop injection and retract the injection barrel.
7. Close the mold without disturbing the parison to pinch off.
8. Now blow the air manually by the valve provided on machine slowly.
9. After blowing, allow the mold for cooling and then remove it.
10. Open the mold and eject the article.

Result: The weight of “.....” article is grams.

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EXPERIMENT NO. 5

Aim: To produce an article from compression moulding machine.

Apparatus: Compression molding machine, hand gloves, mold plates, raw material

Theory:

- 1. Compression Molding:**
- 2. Construction & Working:**
- 3. Neat labeled sketch of molds and machine showing all important parts:**

Procedure:

1. Switch ON the heaters.
2. Open the mold plates completely.
3. After attaining the temperature, feed the raw material in the cavity plate.
4. Start compressing the material.
5. Maintain the compression pressure throughout along with the high temperature.
6. After complete curing, stop heating and provide suitable cooling to mold.
7. Open the mold and eject the article.

Result: The weight for “.....” article is grams.

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EXPERIMENT NO. 6

Aim: To produce an article from rotational moulding machine.

Apparatus: Rotational molding machine, hand gloves, hollow product mold, powder raw material, diesel etc

Theory:

- 1. Rotational Molding:**
- 2. Construction & Working:**
- 3. Neat labeled sketch of machine showing all important parts:**

Procedure:

1. Open the door of heating chamber and the mold.
2. Weigh the material to be loaded in the mold.
3. Clamp the mold after loading the pre-weighed material.
4. Set the major and minor axis rotation speed.
5. Close the oven and start the rotation.
6. Set the temperature and start the burner.
7. Start the air blower and rotate the mold as per heating cycle.
8. After heating cycle, open the gate of the heating chamber and allow the mold to cool.
9. After the cooling cycle is done, open the mold and eject the article.

CONCLUSION: The cycle time of “.....” article is seconds and the weight of the article is grams.

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EXPERIMENT NO. 7

Aim: Study of construction and working of transfer moulding.

Theory:

- 1. Transfer Molding:**
- 2. Construction & Working:**
- 3. Neat labeled sketch of types of machine showing all important parts:**

CONCLUSION: Thus, we have studied transfer molding process.

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EXPERIMENT NO. 8

Aim: Study of construction and working of calendaring.

Theory:

- 1. Calendaring:**
- 2. Construction & Working:**
- 3. Neat labeled sketch of machine showing all important parts:**

CONCLUSION: Thus, we have studied Calendaring process.