Injection Molding – Homework Assignment

2025

Task title: *Cycle setup, documentation, and process analysis*

Objective:
During the laboratory session, each student will set up and optimize an **injection molding cycle** on the machine. The task aims to deepen understanding of the full molding cycle, parameter relationships, and the logic of process optimization.

Tasks

1. **Cycle setup and documentation**
    - o During the lab, set up a complete injection molding cycle on the assigned machine.
    - o Record all key parameters and note any adjustments you made during setup.
    - o Briefly describe the sequence and rationale of your settings (which parameters you set first, why, and how they influence the next ones).
2. **Cycle diagram**
    - o Based on your setup, draw the **cycle diagram** (time vs. process phase).
    - o Indicate key phases such as mold closing, injection, holding, cooling, mold opening, and part removal.
    - o Label all relevant time intervals and pressures.
3. **Focused process analysis**
    - o Each student will be assigned **one specific subsystem** of the molding cycle:

subproject:

A. Mold movement,
B. Clamping force and the setup for different machine types,
C. Injection unit motion and nozzle design,
D. Plasticizing (screw rotation and back pressure),
E. Filling stage,
F. Holding stage,
G. Cooling stage,
H. Part removal (ejection).

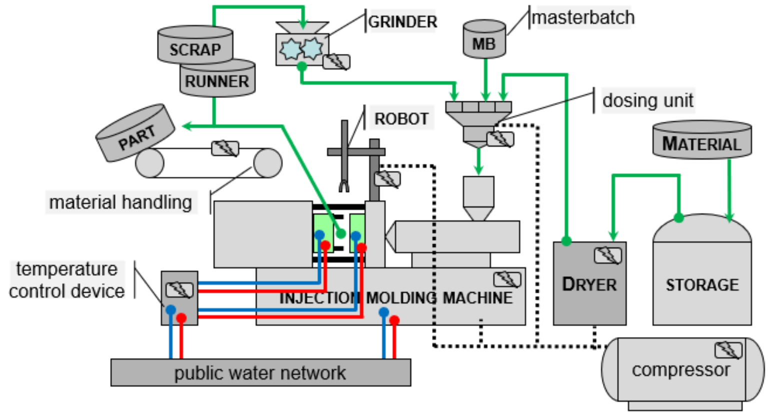
- o For your assigned topic:
    - ▪ Explain its **function and importance** in the injection molding cycle.
    - ▪ Describe **how it can be optimized** (e.g., time reduction, stability, repeatability, energy efficiency).
    - ▪ Support your discussion with **at least two online technical or scientific sources** (properly cited).

Submission requirements

- The report must be written in **English** and submitted **electronically** in **PDF format** via the designated platform.
- Include your **name, student ID, and group number** on the first page.
- The document should contain:
    - o Title page
    - o Summary of setup and cycle diagram
    - o Step-by-step setup explanation
    - o Detailed section on the assigned subsystem with references
    - o References (APA or Harvard style preferred)

Important notes

- AI content detection will be performed. Reports generated by or significantly assisted by AI tools will be cross-checked using AI-based plagiarism detection and internal comparison between submissions.
- Your report must reflect your own understanding and experience from the lab.
- Copy-pasted or AI-generated text without proper acknowledgement will be considered academic misconduct.



Name:
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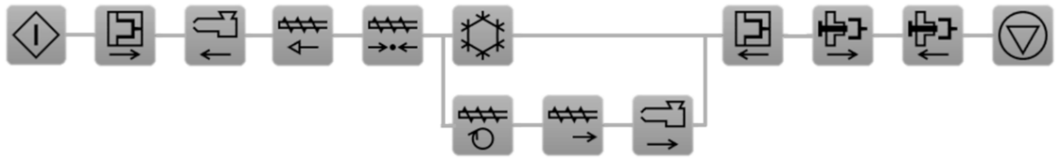

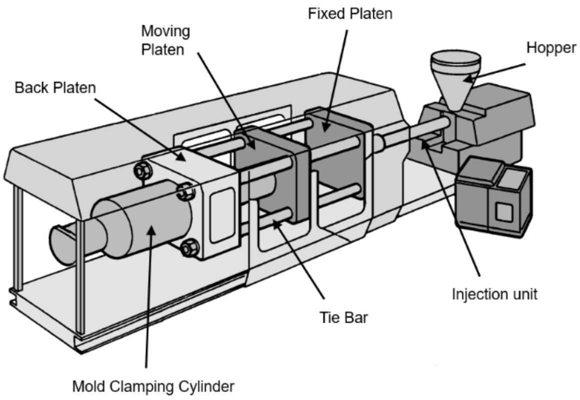

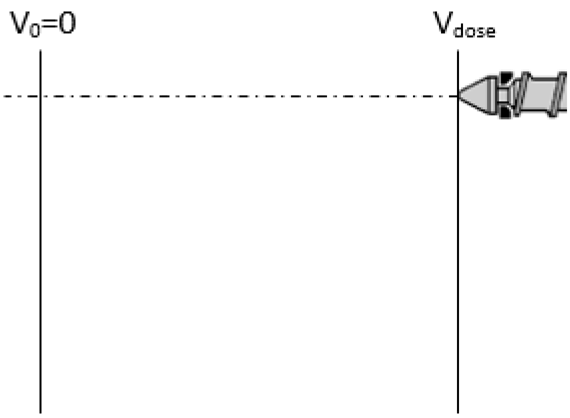

mold opening time= .... [s]

mold closing time= .... [s]

mold opening= .... [mm]

injection unit opening time= .... [s]

injection unit closing time= .... [s]

nozzle distance= .... [mm]

injection time= .... [s]

injection volume= .... [cm^3]

holding time= .... [s]

holding volume= .... [cm^3]

plastification time= .... [s]

screw circumferential speed= .... [m/min]

decompression= .... [cm^3]

decompression time= .... [s]

total ejection time= .... [s]

residual cooling time= .... [s]

cushion= .... [cm^3]

Notes (for your assignment): (e.g., machine type, etc.)