

TECHNOLOGY OF POLYMERIC MATERIALS – EXERCISE 7			
Exercise topic: PROCESSING OF POLYMERIC MATERIALS – INJECTION MOULDING			
Faculty:	CHEMICAL TECHNOLOGY	Year: I	Term: V
Speciality:	Chemical Technology		

1. Purpose of the exercise:

theoretical - studying the injection moulding as a method of processing of polymer materials

practical - learning the injection moulding machine handling and determining the influence of process parameters on quality properties of the finished product

2. Theoretical issues:

injection moulding process, thermoplastic injection moulding methods, course of injection moulding cycle, types of injection moulding machines, construction of injection moulding machines, construction of injection moulds

3. Bibliography:

1. Crawford R.J. : „Plastics Engineering”, Butterworth-Heinemann 1998.
2. Ram A.: “Fundamentals of Polymer Engineering”, Plenum Press, New York 1997.
3. Vegt A.K.: “From polymers to plastics”, DUP Blue Print, Delf 2002.
4. Rosato D.: “Injection Molding Handbook”, Kluwer Academic Publishers, Massachusetts 2000

4. Experimental part:**I. Injection moulding machine start - up and operation:**

CAUTION!! START – UP AND OPERATION OF THE MACHINE ONLY BY THE LECTURER!!!

CAUTION!! DO NOT TOUCH ANY MOVING PARTS OF THE MACHINE WHILE CLOSING AND OPENING THE MOULD!!!

CAUTION!! DO NOT TOUCH THE MOVING PARTS OF THE MACHINE DURING INJECTING AND PLASTIFYING PROCESS OF THE PLASTIC. MANIPULATING IN THE HOPPER DURING PISTON MOVING IS HIGHLY FORBIDDEN. DO NOT TOUCH THE INJECTION MOULDING MACHINE

CYLINDER AND THE MOULD AREA. CAUTION!! OPERATE THE INJECTION MOULDING MACHINE ONLY WHEN THE SAFETY NET OF THE WORKING SYSTEM OF THE MACHINE IS CLOSED!!!.

II. Exercise execution:

- ✓ determining the temperature profile for the polymer materials used in the exercise: ABS
- ✓ determining the influence of the process parameters (pressure, cooling temperature) on the quality of the finished product (visualization assessment and by measuring the weight of the moulded part)
- ✓ determining the influence of the clamping phase and clamping pressure on the mass of the moulded part and its quality

5. Results reporting:

Describe the exercise performance, prepare a summary of the results of the measurements, prepare relevant graphs/tables, carry out a discussion about the results and draw conclusions. Show the graph presents a mass of moulded parts as a function of clamping pressure. Answer for the question how the parameters of the injection moulding process influences on quality of the finished product

6. Safety rules:

I. All tests and measurements involved in the exercise must be carried out in accordance with the lecturer's instructions

II. Always wear safety glasses while operating the injection moulding machine!!!

III. Data sheets of the substances must be read before starting the exercise (see the attachment)

IV. Take particular caution while:

CLOSING AND OPENING OF THE MOULD – DO NOT TOUCH ANY MOVING PARTS OF THE MACHINE!!!

INJECTION AND WITHDRAWAL OF THE SCREW – DO NOT TOUCH THE MOVING PARTS.
MANIPULATING IN THE HOPPER DURING THE SCREW MOVEMENT IS FORBIDDEN. DO NOT
TOUCH THE INJECTION MOULDING MACHINE CYLINDER AND THE MOULD AREA.