

| PROCESSING OF POLYMERIC MATERIALS – EXERCISE No. 5 | | | |
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| Exercise Title: THERMOFORMING | | | |
| Faculty: | CHEMICAL TECHNOLOGY | Year: I | Term: I |
| Speciality: | Composites and Nanomaterials | | |

1. Exercise objectives:

theoretical - studying the thermoforming as a method of processing of polymer materials

practical - learning the vacuum forming machine handling and determining the thermoforming depth ratio

2. Theoretical issues:

thermoforming process – definition, methods of thermoforming processes, preferred plastics (polymer) in the thermoforming.

3. Literature:

1. Andrew W.: *“Handbook of Plastics Joining. A Practical Guide”*, Plastics Design Library, New York 1997
2. Reyne M.: *“Plastic Forming Processes”*, John Wiley & Sons, Inc., Hoboken 2008.

4. Experimental part:

- a) vacuum forming machine start - up and operation

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

CAUTION!! DO NOT TOUCH ANY HEATING PARTS OF THE MACHINE!!!

- b) Exercise execution:

- prepare a thermoforming process – positive mold (face mask);
- prepare a thermoforming process for three types positive mold. Determine the thermoforming depth ratio: H/D

where: H – mold depth [mm], D – mold dimension [mm];

- plot the graphs: films thickness (after thermoforming process) versus thermoforming depth ratio.

5. Results reporting:

Describe the exercise performance, prepare a summary of the results of the measurements, prepare relevant graphs, carry out a discussion about the results and draw conclusions.

6. Safety rules:

- I. All tests and measurements involved in the exercise must be carried out in accordance with the lecturer's instructions**
- II. Do not touch any heating parts of the machine.**