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MACHINE TECHNOLOGY AND DESIGN OF PRODUCTION PROCESSES

TOPICS:

1. Introduction to laboratory classes
2. The process of thermoforming
3. 3D printing technology
4. Single screw extrusion – line for pipe production
5. Manual lamination – how are the polyester resin-based composites made?
6. Basics of injection moulding – cycle phases

TOPIC: The process of thermoforming

GUIDELINES:

- Definition of thermoforming
- Types of thermoforming processes
- Types of materials suitable for thermoforming
- Molds for thermoforming (materials and types)
- Example products that can be made by the thermoforming process.

TOPIC: 3D printing technology

GUIDELINES:

- Definition of 3D printing
- Types of 3D printing techniques (FDM, SLS, etc.)
- Construction of a FDM printer
- Types of substances, materials, and plastics used in 3D printing
- Applications of FDM technology

TOPIC: Single screw extrusion – line for pipe production

GUIDELINES:

- Basic definitions (eg. extrudate, extruder, calibrator)
- Principles of the extrusion process
- Extrusion types (conventional, autothermal, porous, coating)
- Screw plasticizing systems
- Types and construction of extrusion dies
- Extrusion capacity
- Extrusion line elements
- Examples of products manufactured by the extrusion method

TOPIC: Manual lamination – how are the polyester resin-based composites made?

GUIDELINES:

- Basic definitions (e.g. thermosets, composites, laminates)
- Materials for the production of laminates: chemosetting resins, fibers
- Materials used to produce forms, types of forms and types of release agents
- Methods of lamination
- Properties of polymer composites
- Applications of polymer composites

TOPIC: Basics of injection moulding – cycle phases

GUIDELINES:

- Basic definitions (eg. polymers, plastics, additives, injection moulding)
- How to inject different types of plastics?
- Construction of injection molding machine
- Types of plasticizing systems used in the plastics' processing
- Injection proces cycle
- Basic parameters of the injection process
- Examples of products manufactured by the injection moulding method

LITERATURE:

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