ATMT-2410: ADVANCED MOLDMAKING

Cuyahoga Community College

Viewing: ATMT-2410 : Advanced Moldmaking

Board of Trustees:
1999-07-22

Academic Term:
Spring 2019

Subject Code
ATMT - Appd Ind Tech-ManufacturingTec

Course Number:
2410

Title:
Advanced Moldmaking

Catalog Description:
Study of fundamentals of mold construction, processes and construction of plastic molds such as compression, transfer, pressure molding of non-ferrous alloys, rubber molds, dies cast molds, and injection molds. Includes foundations of mold construction, depending on design of part, material used, equipment available, and ingenuity of moldmaker.

Credit Hour(s):
2

Lecture Hour(s):
2

Requisites

Prerequisite and Corequisite
ATMT-2500 Manufacturing Technology Skills II, and departmental approval.

Outcomes

Course Outcome(s):
N/A

Objective(s):
1. Describe the types of plastics.
2. Explain the principles of compression molding.
3. Demonstrate a practical knowledge of transfer molding.
4. Discuss the concepts of injection molding.
5. Identify and understand mold components.
6. Explain the principles of runner and gates.
7. Describe the methods of heating and cooling of a mold.
8. Describe the principles of zinc and aluminum die cast dies.
9. Determine the use of rubber molds.
10. Demonstrate mold safety and maximum production.

Methods of Evaluation:
1. Quizzes
2. Exams
3. Classroom participation

Course Content Outline:

1. Plastic types:
   a. Phenolics
   b. Urea-formaldehyde
   c. Melamine
   d. Cellulosics
   e. Styrene
   f. Vinyl
   g. Acrylics
   h. Nylon
   i. Polyethylene
   j. Polypropylene
   k. Polycaronate
   l. Fluorocarbons
   m. Additives (glass fibers, talc, Teflon, etc.)
2. Compression molding
   a. Mold construction (platen, cavity, plunger, chase, land, piece part)
   b. Positive molds
   c. Venting
   d. Preform
   e. Flash
   f. Parting line
   g. Flash molding
   h. Semi-positive
   i. Bulk factors
   j. Classification (hand, semi-autmatic, automatic)
   k. Split wedge molds
   l. Wedges
   m. Methods of heating
3. Transfer molding
   a. Principle (sprue, runners, gates)
   b. Pot transfer
   c. Procedures
   d. Plunger transfer
   e. Tonnage
4. Injection molding
   a. Process and principle
   b. Pre-built or standard mold base sets
   c. Function of mold base parts (plates, rings, bushings, retainers, ejectors, spacers, pullers, leader pins)
   d. Three plate molds
   e. Hot runner molds
   f. Slide molds
5. Mold components
   a. Pockets
   b. Conventional ejector systems
   c. Sleeve and blade
   d. Spring-loaded return pins
   e. Side action
   f. Angle pins
   g. Cam blocks
   h. Stripper plate ejection
   i. Ring bars
   j. Inserts
   k. Cores and core pins
   l. Standard parts
6. Runner and gates

   a. Purpose of runners
   b. Size and shape
   c. Multiple cavity
   d. Multiple runners
   e. Cold slug wells
   f. Sprue pullers
   g. Fan gates
   h. Ring gates
   i. Direct gates
   j. Tab gates
   k. Overflow wells
   l. Pin point gates
   m. Tunnel or submarine gates
7. Heating and cooling
   a. Channeling of plates
   b. Deep or long plungers
   c. Flow patterns
   d. Baffles
   e. Patterns
   f. O-rings
   g. Flat cores and shallow cavities
   h. Zone cooling
   i. Bubblers
   j. Diverting plugs
8. Mold base and cavity construction
   a. Gates
   b. Balanced system of gating
   c. Pantographs
   d. Duplicating machines
   e. Plate sizes
   f. Gun drills
9. Zinc and aluminum die cast dies
   a. Cavities
   b. Types of mold bases
   c. Cores
   d. Spreaders
   e. Ejection
   f. Cooling and water channels
10. Mold life / mold steels and heat treating
   a. Piece parts
   b. Pre-hardened
   c. Normalizing
   d. Annealing
   e. Stress relieving
   f. Hardening
   g. Tempering
   h. Cyaniding
   i. Carburizing
   j. Nitriding
11. Mold polishing
   a. Specific finishes
   b. Hardware finish
   c. Polishing grits
12. Rubber molds
   a. Basic designs
   b. Loading of molds
   c. Flash

   d. Hinged molds
   e. Series of operation
13. Mold safety
   a. Guards
   b. Water line / coupling inspection
   c. Work environment
   d. Problem solving

Resources

Hardman, William. *Basic Machine Shop Theory.* Washington: NTMA Textbook Series, 1982.

Krar, Steve and Check Albert. *Technology of Machine Tools.* Westerville: Glencoe/McGraw-Hill, 1997.

Klutz, John. "Moldmaking and Diecast Dies"

Top of page
Key: 502