

ATMT-2400: ADVANCED DIEMAKING

Cuyahoga Community College

Viewing: ATMT-2400 : Advanced Diemaking

Board of Trustees:

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Academic Term:

Spring 2019

Subject Code

ATMT - Appd Ind Tech-ManufacturingTec

Course Number:

2400

Title:

Advanced Diemaking

Catalog Description:

Provides a study of important advanced elements of die function and performance. Course will act as a resource for apprentices, tool designers, and others who need a working reference on design, construction, and use of stamping dies.

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. Explain and list essential die-to-press relationships.
2. Explain what factors determine automatic feeds.
3. Explain the functions of inverted dies.
4. Identify and discuss compound dies.
5. Construct a progressive die using the blank through principle.
6. Identify progressive dies using the chop off principle.
7. Identify progressive dies using the parting line principle.
8. Identify functions of secondary operations: dies to pierce, semipierce, shear form, and form 100.
9. Describe drawing operations: die to notch, trim, shave, and side action dies.
10. Demonstrate drawing operations: computation procedures.
11. Describe transfer and progressive die, and deep draw hydraulic presses.

Methods of Evaluation:

1. Quizzes
2. Classroom participation
3. Exams

Course Content Outline:

1. Die-to-press relationships
 - a. OBI presses
 - b. Die to press relationship
 - c. Shut heights
 - d. Shut heights relationships
 - e. Dimensional relationships
2. Automatic feeds
 - a. Basic feed types
 - b. Mechanical slide feeds
 - c. Feeds for existing equipment
 - d. Feeding thin stock
 - e. Air slide feeds
 - f. Hitch feeds
 - g. Roll feeds
 - h. Chain driven roll feeds
 - i. Wedge type feeds
3. Inverted dies
 - a. Utility considerations
 - b. Positive shedder proportions
 - c. Positive types
 - d. Shedding and stripping
 - e. Shedder to press relationship
4. Riddance action for delicate shedders
 - a. Shedding pin functions
 - b. Shedding vents
 - c. Compressive shedders
 - d. Pushback dies
5. Compound dies – fundamentals of compound dies
6. Compound dies with thrust plates
 - a. Construction relationships
 - b. Association with other applications
 - c. Knockout construction
 - d. Burr side
 - e. Ejection space
 - f. Differential cutting clearance
7. Blanking size related to die life
 - a. Die and punch inset in shoes
 - b. Composite construction
 - c. Angled orientation
 - d. Shedding pins
 - e. Construction costs
 - f. Two pass dies
 - g. Consistent accuracy
8. Progressive die using the blank through principle
9. Fundamental progressive pierce and blank dies
 - a. Operating sequence
 - b. Screw attachments
 - c. Doweling
 - d. Spring pins
 - e. Three station dies
 - f. Sequence of progression
 - g. Piercing and piloting unit
10. Progressive dies using the chop off principle:
 - a. Chop off fundamentals
 - b. Guideposts
 - c. Force-balanced chop off
 - d. Lateral forces

- e. Construction
- f. Lead-end trimming
- g. Dimension relationships
- h. Leveling
 - i. Combined chop off and form
 - j. Maintenance considerations
 - k. Mismatching
- 11. Progressive dies using the parting line principle--contour relationships
- 12. Non-piloting pierce and part dies
 - a. Burr side
 - b. Construction and operation
- 13. Die to trim part, pierce, and form down
 - a. Alternative construction
 - b. Cutting relationships
- 14. Parting and U-bending dies
- 15. Functions of secondary operations – dies to pierce, semipierce, and shear
- 16. Form 100
 - a. Piece-art requirements
 - b. Positive knockouts
 - c. Die construction
- 17. Horn-type pierce die
 - a. Strip growth
 - b. Multilevel piercing
 - c. Close space piercing
 - d. Inverted horn dies
 - e. Semi piercing
 - f. Shear forms
 - g. Slugless pierce dies
 - h. Overforms
- 18. A preformed die and final form die – forming cylindrical bands
- 19. Secondary operations: die to notch, trim, shave, side action dies
 - a. Bumper actuated notching die
 - b. Construction
 - c. Inverted type trim dies
 - d. Flange trimming dies
 - e. Nesting
 - f. Scrap disposal
 - g. Cutting clearances
 - h. Shaving
 - i. Shaving direction
 - j. Standard allowances
 - k. Positive Reciprocation
 - l. Cams
- 20. Drawing operations: computation procedures:
 - a. Basic draw terminology
 - b. Design and construction
- 21. Plain push through draw dies
 - a. Beveled dies
 - b. Elliptical draw edge
 - c. Drawing speeds
 - d. Action of dies
 - e. Latch-type strippers
 - f. Pad type
 - g. Optimal die and draw piece

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.

Ostergaard, Eugene. "Advanced Diemaking"

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