

Indexed Milling Procedures

Course 327: Indexed Milling Procedures

Covers the use of the dividing head. Covers plain, differential, and angular indexing. Explains the use of the dividing head for milling hexagons. Proceeds to the cutting of spur gears, helical gears, and cams.

TPC Training is accredited by IACET to offer **0.5 CEU** for this program.



Lesson 1: Using the Dividing Head

Topics

Indexing; The Dividing Head; Direct Indexing; Simple Indexing; Indexing Fractions of a Turn; Using Sector Arms; Selecting an Index Plate; Angular Indexing; Indexing Parts of a Degree; Compound Indexing; Differential Indexing

Objectives

- Describe indexing and its uses.
- Identify the parts of a dividing head.
- List the four types of indexing you can do with a dividing head.
- Explain how to use sector arms to index fractions of a turn.
- Select the right index plate for the job.

Lesson 2: Dividing Head Setup

Topics

Mounting the Dividing Head; Holding Work on the Dividing Head; The Dividing Head Center; The Dividing Head Driver; The Dividing Head Chuck; Milling Hexagons; Side Milling the Hexagon; Depth of Cut; Setting Up the Dividing Head; Straddle Milling a Hexagon; Milling Hexagonal Bars; Indexing the Workpiece; Using Indexing for Drilling Holes

Objectives

- Mount a dividing head on a milling machine table.
- Mount work between a dividing head and footstock.
- Mount work in a dividing head chuck.
- Index and side mill or straddle mill a hexagonal workpiece.
- Use the dividing head to index a series of holes in a circle.

Lesson 3: Milling Spur Gears

Topics

Milling Spur Gear Teeth; Preparing the Workpiece; Checking Concentricity; Selecting the Cutter; Installing the Cutter; Aligning the Workpiece and Cutter; Setting Up the Dividing Head; Milling Large-Diameter Spur Gears; Indexing With a Rotary Table; Inspecting Finished Gears; Using a Gear Tooth Caliper; Measuring Sample Gears; Helical Milling; Helical Forms and Terminology; Helix Angle; Helix Pitch

Objectives

- Index spur gear teeth on a gear blank.
- Use formulas to compute gear tooth dimensions.
- Select the correct cutter for specific spur gear tooth dimensions.
- Explain how to use a rotary table.
- Use the measuring over pins technique to check the dimensions of gears.
- Define the terms helix, helix lead, helix angle, and helix pitch.

Lesson 4: Helical Milling

Topics

Computing Change Gearing; Using Idler Gears; Milling Helical Flutes; Indexing Setup; Swiveling the Table; Selecting the Cutter; Aligning the Cutter; Setting Depth of Cut; Milling the Helix; Helical Gears; Milling a Helical Gear; Cutter Selection; Milling the Teeth

Objectives

- Use change gears to vary the lead of the milling machine.
- Describe the purpose of idler gears.
- Compute the lead of a helix.
- Index and mill helical teeth on a cutter.
- Index and mill helical gears

Lesson 5: Milling Cams

Topics

Cam Functions; Nonpositive Cam Systems; Positive-Type Cam Systems; Uniform Motion Systems; Harmonic Cam Systems; Radial Cam Definitions; Milling a Uniform-Rise Cam; Milling Short-Lead Cams; Milling Multilobe Cams; Nonuniform-Rise Cams; Incremental-Cut Method

Objectives

- Describe positive and nonpositive cam systems.
- Define radial cam terms such as cam lobe, uniform rise, cam rise, and cam lead.
- Mill a uniform-rise cam.
- Mill a short-lead cam.
- Mill a multilobe cam.
- Explain how to use the incremental-cut method to mill a nonuniform rise cam.