



Introduction to Packaging

Course 311: Introduction to Packaging

Covers the job of packaging mechanic. Provides detail on major types of packaging machinery. Covers various mechanical drives, couplings, motors, brakes, variable speed drives, clutches, electrical controls, motor starters, event sequencing controls, time delays, and relays. Includes packaging specifics: types of materials, methods of filling, methods of sealing, weights, and volumetric measurements.

TPC Training is accredited by IACET to offer **1.0 CEU** for this program.



Lesson 1: The Packaging Mechanic

Topics

What is Packaging?; Packaging Operations; Packaging Machinery Maintenance; Planned Maintenance; Lubrication

Objectives

- Describe types of machines for packing and filling.
- Describe packaging machinery breakdown maintenance procedures.
- List specific requirements for planned packaging machinery maintenance.
- Explain packaging machinery lubrication selection, scheduling, and correct application.

Lesson 2: Actuating Mechanisms

Topics

Actuating Mechanisms; Cranks; Cams; Intermittent Motion Mechanisms; Geneva Wheels; Reciprocating Drives; Angle-Doubling Drives; Toggle Links; Detents; Overload Protection Drives

Objectives

- Explain the operation of the lever and crank.
- Describe the differences among types of cams.
- Explain how ratchet wheels and Geneva wheels produce intermittent motion.
- Describe reciprocating and oscillating drive mechanisms.

Lesson 3: Problem Solving Principles

Topics

Solving Problems; Elements of Measurement; Measurement Tolerances; Types of Packaging Machines; Basic Machine Elements; Troubleshooting a Packaging Machine; Determining Causes of Trouble

Objectives

- Describe the differences between intermittent-motion and continuous-motion packaging machines.
- Explain how to time a packaging machine with a timing dial.
- Define the four basic machine elements—timing, position, stroke, and alignment.
- List correct packaging machine troubleshooting steps.

Lesson 4: Mechanical Drives

Topics

Drive Mechanisms; Couplings; Coupling Construction; Coupling Installation; Belt Drives; Chain Drives; Speed Reducers; Gearing

Objectives

- List the functions of couplings.
- Explain the differences among the more common types of couplings.
- Describe how to check coupling alignment and how to correct a misalignment.
- Compare the different types of belt and chain drives.
- Describe the different types of speed reducers and gearing.

Lesson 5: Motors and Brakes

Topics

Primary Drive Components; AC Motors; Fractional-Horsepower Motors; Three-Phase Motors; Motor Construction Classification; Special Motors; Mechanical/Electrical Speed Drives; Electric Clutches; Hydraulic Clutches; Mechanical Clutches; Brakes; Friction Shoe Brakes; Friction Disk Brakes; Maintenance

Objectives

- Describe the basic features of ac motors.
- Compare the different types of fractional-horsepower motors and three-phase motors.
- List the features of common and special types of motors.
- Explain how variable-speed units work.
- Describe the operation and use of electric, hydraulic, and mechanical clutches.

Lesson 6: Electrical Controls

Topics

Machine Identification; Start-Up Sequence; Motor Starters; Running Sequence; Machine Control; Time-Delay Relays; Product Control; Adhesive Application; Product Detectors

Objectives

- Describe the elements of a packaging machine's start-up sequence.
- Explain how thermal overload and melting alloy starters work.
- Explain the use of detectors and time delays in packaging machine control.
- Describe how adhesive is applied.
- Explain the differences in operation among types of product detectors.

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Lesson 7: Packaging Materials

Topics

Materials; Films; Shrink Films; Nonshrinkable Films; Combination Films; Water-Soluble Films; Plain and Coated Papers; Chipboard Cartons; Glass Bottles and Jars; Plastic Bottles and Jars

Objectives

- List the characteristics of film.
- Compare the different types of shrink film.
- Name the different types of combination films.
- Describe the uses of water-soluble film, kraft paper, and chipboard.
- List the advantages and disadvantages of glass and plastic bottles and jars.

Lesson 8: Methods of Filling

Topics

A Definition of Filling; Flexible Packaging; Vertical-Fill Machines; Horizontal-Fill Machines; Pouch Filling; Weigh Filling; Carton Filling; Liquid Filling; Filling by Count

Objectives

- Describe the operation of vertical and horizontal flexible film packaging machines.
- Explain how volumetric pouch filters work.
- Explain how carton-filling and liquid-filling machines work.
- Describe methods of filling by count.

Lesson 9: Methods of Sealing

Topics

What Is Sealing?; Tube Sealing; Film Sealing; High-Frequency Sealing; Capping; Seaming; Tying; Sewing; Gluing; Stapling or Stitching; Strapping

Objectives

- Describe how plastic and metal tubes are sealed.
- Explain the operation of different types of film sealers.
- Describe how high-frequency sealers work.
- Explain the basics of cappers and seamers.
- Describe correct procedures for using hot and cold glues.

Lesson 10: Weighing and Measuring

Topics

Units of Weight; Measuring Devices on Packaging Machines; Volumetric Measuring; Weighing Devices; Scale Components and Installation; Net Weighers; Controls; Check Weighers; Troubleshooting and Maintenance; Installation Suggestions

Objectives

- Explain the uses of gross, net, and check weighers.
- Compare the mechanisms of counterbalances and force balance systems.
- List the components in a scale system.
- Explain how typical check weighers work.
- Describe proper troubleshooting, maintenance, and installation techniques for scales.