



Packaging Machinery

Course 312: Packaging Machinery

Covers operating and servicing various types of packaging machinery. Describes different types of liquid filling machines. Covers positive displacement fillers, filling, and sealing machines, as well as volumetric filling machines and blister packaging machines.

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



Lesson 1: Gravity and Vacuum Filling

Topics

Gravity Filling; Vacuum Pumps; Vane Pump Construction; Piston Pump Construction; Vacuum Pump Installation; Vacuum Filling; Gravity/Vacuum Filling; Balanced Vacuum Filling; Submerged Vacuum Filling; Fill Height Control; Container Control

Objectives

- List the main advantage and disadvantages of gravity filling and vacuum filling methods.
- Tell what kinds of vacuum pumps are commonly used in filling applications.
- Describe the construction and operation of vane and piston pumps.
- Compare and contrast vacuum filling, gravity/vacuum filling, balanced vacuum filling, and submerged vacuum filling.
- Explain various methods of fill height and container control.

Lesson 2: Bottle Filling and Capping

Topics

Bottle Filling Considerations; Volumetric Filling; Piston-Type Filling Machines; Piston-Type Volumetric Filling Machines; Auger Feed Pumps; Volumetric-Displacement Machines; Constant-Level Filling Machines; Other Constant-Level Fillers; Counterpressure Filling; Capping and Sealing; Screw Cappers; Bottle Filling Machine Maintenance

Objectives

- List some of the factors considered when selecting a bottle filling machine.
- Explain the operation of, piston-type, auger, volumetric-displacement, and constant-level filling machines.
- Describe the various kinds of bottle capping and sealing.
- List the major maintenance requirements of liquid filling machines.

Lesson 3: Pressure Liquid Filling

Topics

Pressure Filling Principles; Pressure Filling Techniques; General Construction; Indexing Pressure Fillers; Indexing Container Filling; Machine Control; Indexing Container Control; Continuous Motion Pressure Fillers; Rotary Pressure Fillers; Continuous Container Control; Continuous Container Filling; Filling Nozzle Construction; Direct Pressure Filling Machines; Filling Control

Objectives

- Name the most important advantage of using positive displacement pumps on pressure filling machines.
- Name the two classifications of pressure fillers.
- List possible causes of filling inaccuracies.
- Explain the importance of proper fluid velocity in filling machine operation.

Lesson 4: Aerosol Fillers

Topics

Aerosol Filling; Aerosol Containers; Metal Container Construction; Aerosol Valves; Aerosol Propellants; Container Filling; Cold Filling; Pressure Filling; Individual Station Operation; Safety Testing; Drying; Capping; Additional Accessory Equipment

Objectives

- Explain the concept of aerosol filling.
- Describe metal container and aerosol valve construction.
- Name and describe the two methods of aerosol container filling.
- Explain the operation of the individual stations in a filling line.
- Describe the process by which aerosol containers are safety tested.

Lesson 5: Bag Forming and Filling

Topics

Machine Classification; Bag Materials; Bag Construction; Classifying Bags; Bag Forming; Additional Bag Forming Operations; Other Bag Forming Machines; Film Extrusion; Bag Filling Machines; Filling Machine Modifications; Bag Machinery Maintenance

Objectives

- List commonly used bag materials and their typical applications.
- Explain the various bag constructions and related terminology.
- Describe the film extrusion method of bag forming.
- Explain the operation of bag filling machines.
- List the major maintenance requirements of bagging machinery.

Lesson 6: Pouch Filling

Topics

Pouch Filling Machine Classification; Pouch Materials and Control; Vertical Filling Machines; Vertical Pouch Filling; Vertical Pouch Filling Modifications; Horizontal Pouch Filling; Continuous Motion Horizontal Fillers

Objectives

- Tell how pouch filling machines are classified.
- Name the three types of vertical seals made on vertical form, fill, and seal machines, and tell when each is used.
- Explain the vertical filling machine operating sequence.
- Name the two methods of classifying pouch filling machines that handle the film horizontally, and give advantages of each.

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Lesson 7: Volumetric Filling Machines

Topics

Types of Volumetric Filling Machines; Balance Point Measuring; Measuring by Volume; High Speed Measuring by Volume; Intermittent Motion Fillers; High Speed Measuring by Volume; Continuous Vacuum Draw Filling; Measuring by Weight; Liquid Volumetric Filling; Volumetric Piston Filling Machines; Volumetric Filling Machine Maintenance

Objectives

- Give examples of products that can be handled by volumetric fillers.
- Explain how volumetric filling machines are identified.
- Describe the operation of volumetric filling machines.
- Describe the various methods of measuring products packaged on volumetric filling machines.
- Explain how liquid volumetric filling is controlled.

Lesson 8: Filling by Count

Topics

Why Count Filling is Used; Machine Selection Factors; Filling by Count Machines; Flat Plate and Disc Sorters; Column Measuring; Modified Column Counting Machines; Electronic Counting; Strip Packaging Machines; Blister Strip Packaging Machines; Cottoning Devices

Objectives

- Give examples of products that are commonly packaged by count.
- Describe three methods of counting product in a fill by count machine.
- Define the term strip packaging, name its two classifications.
- Give an example of a product packaged by each of the two strip packaging methods.

Lesson 9: Positive Displacement Filling

Topics

Principles of Filling; Controlling the Fill; Filling Machines; Manual Fillers; Automatic Filling Machines; Timing Control; Continuous Motion Filling Machines; Rotary Filling Methods; Machine Maintenance

Objectives

- Trace the positive displacement filling cycle.
- Name the kinds of pumps used to fill containers on positive displacement filling machines.
- Describe the controls associated with positive displacement filling systems.
- List important points in the maintenance of positive displacement filling machines.

Lesson 10: Blister Packing

Topics

Blister Packaging; Blister Films; Blister Cards; Blister Card Board Construction; Blister Card Problems; Reducing Blister Failures; Preliminary Test Procedures; Conducting the Tests; Seal Examination and Evaluation; Product Compatibility; Blister Forming Machines; Blister Packaging and Sealing Machines

Objectives

- Define the term thermoforming.
- Describe the film and card materials commonly used in blister packing.
- Give several examples of problems that can cause blister failures.
- Describe the tests and evaluations performed on blister package seals.
- Tell what kind of film is most often used with inline blister forming machines.