



Module 5.3.4

Packages Labeled by Volume, Volumetric and Gravimetric

Overview and Scope

This module sets standards for basic inspection and testing for checking the net contents of packaged goods. The module is geared toward specific concepts that can be applied to checking packages labeled by volume using either gravimetric or volumetric means. The module includes concepts relating to device technology, inspection considerations and requirements, and test procedures.

Prerequisites

5.3.1 Commodities - General; 5.3.2 Packages Labeled by Weight, Standard and Random

Learning Objectives

1 Scope

A weights & measures inspector should know which products may be tested using volumetric procedures and understand the underlying principles involved in those procedures. To demonstrate this, the inspector can:

- 1.1 List the types of products that can be tested with volumetric procedures.
- 1.2 Describe the various volumetric procedures used to test packages labeled by volume.
- 1.3 Explain the roles density and product temperature play in determining whether gravimetric or volumetric testing will be conducted.
- 1.4 Utilize Table 3-1 to determine the appropriate reference temperature for a liquid.

2 Measurement Standards and Test Equipment

A weights & measures inspector should understand the criteria for selecting test equipment, and the procedures for verifying test equipment. To demonstrate this, the inspector can:

- 2.1 Select the appropriate volumetric measure based upon the declared volume of the package.
- 2.2 Determine the density of the liquid and calculate the nominal gross weight of the package.
- 2.3 Calculate 1/6 MAV for the package based upon product density and label volume.

- 2.4 Select other standards and measurement equipment in accordance with the requirements of NIST Handbook 105, including:
 - 2.4.1 Stopwatches.
 - 2.4.2 Thermometers.

3 Basic Gravimetric Test Procedure

A weights & measures inspector should understand the basic gravimetric test procedure. To demonstrate this, the inspector can:

- 3.1 Identify and define the inspection lot.
- 3.2 Select the appropriate sampling plan.
- 3.3 Select the random sample.
- 3.4 Bring the packages and their contents to the proper reference temperature.
- 3.5 Determine tare weight for the random sample.
- 3.6 Wet down a clean volumetric measure.
- 3.7 Determine the density of the liquid and calculate the nominal gross weight of the package.
- 3.8 Measure the net contents of the packages in the sample.
- 3.9 Evaluate compliance with the MAV requirement.
- 3.10 Evaluate compliance with the average requirement.

4 Basic Volumetric Test Procedure

A weights & measures inspector should understand the basic gravimetric test procedure. To demonstrate this, the inspector can:

- 4.1 Identify and define the inspection lot.
- 4.2 Select the appropriate sampling plan.
- 4.3 Select the random sample.
- 4.4 Bring the packages and their contents to the proper reference temperature.
- 4.5 Wet down a clean volumetric measure.
- 4.6 Measure the net contents of the packages in the sample.
- 4.7 Evaluate compliance with the MAV requirement.
- 4.8 Evaluate compliance with the average requirement.

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