

12/10/2025

API appreciates the feedback received on this work item (LMD-26.1) during the Regional Weights and Measures meetings and as a result has updated the language in Publication 15 to incorporate that input.

HB 44

LMD-26.1 (Proposal Modified 12/10/2025)

S.2. Measuring Elements, S.4. Marking Requirements, N.4. Testing Procedures, U.R.6. Temperature Compensation and Volume Correction, Wholesale, and T.5. Density Correction Systems.

Source:

American Petroleum Institute

Purpose:

Clarify the acceptable use of specific density correction methods that allow for the accurate determination of volume growth that occurs when gasoline is blended with ethanol to make a finished motor fuel.

Item under Consideration:

Amend NIST Handbook 44 Liquid Measuring Devices Code as follows: 18

S.2. Measuring Elements

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S.2.9. Wholesale Devices Equipped with Electronic Automatic Density-Correction Systems.

S.2.9.1. Automatic Density Correction. – If a wholesale device such as a register, used for blending gasoline and ethanol, is equipped with an automatic means for adjusting the indication and registration of measured volume of product to correct for the expansion of volume when blending separately metered components (e.g., ratio-blending, sequential blending) to create a new product with altered properties then the device must also be equipped with an electronic automatic temperature-compensating system.

S.2.9.2. Provision for Deactivating. – On a device equipped with an automatic density-correction system, provision shall be made for deactivating the automatic density-correction system so that the meter can indicate and record in terms of the uncorrected volume.

(Added 202X)
Nonretroactive

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S.4 Marking Requirements

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S.4.3. Wholesale Devices.

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S.4.3.3. Automatic Density Correction for Changes in Product Composition. – If a device is displaying density-corrected volumes, then the volumes must be labeled clearly and conspicuously on the primary indicating elements, recording elements, and recorded representation that the adjustment has been made.

(Added 202X)

Nonretroactive

N.4. Testing Procedures

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N.4.1.2. Wholesale Devices Equipped with Automatic Density Correction. – On wholesale devices equipped with automatic density correction for changes in product composition due to blending, normal tests shall be conducted:

- (a) by comparing the density corrected volume indicated by the device to the actual delivered volume corrected to 15 °C (60 °F) using the current version of ASTM D1250, *Standard Guide for the Use of the Joint API and ASTM Adjunct for Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils: API MPMS Chapter 11.1.***
- (b) with the density correction system deactivated, comparing the uncompensated volume indicated or recorded to the actual delivered volume.**

The first test shall be performed with the automatic density-correction system operating in the “as found” condition.

On devices that indicate or record the density-corrected volume, temperature-compensated volume, and uncompensated volume for each delivery, the tests in N.4.1.1.(a), N.4.1.1.(b), and N.4.1.2., may be performed as a single test.

(Added 202X)

Nonretroactive

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T. Tolerances

T.4. Automatic Temperature-Compensating Systems. – *The difference between the meter errors (expressed as a percentage) determined with and without the automatic temperature-compensating system activated shall not exceed:*

- (a) 0.2 % for mechanical automatic temperature-compensating systems; and*
- (b) 0.1 % for electronic automatic temperature-compensating systems.*

The delivered quantities for each test shall be approximately the same size. The results of each test shall be within the applicable acceptance or maintenance tolerance.

[Nonretroactive as of January 1, 1988]

(Added 1987) (Amended 1992, 1996, and 2002)

T.5. Density Correction Systems. – ***The difference between the calculated volume of the net final banded product inclusive of growth and the volume calculated using ASTM D1250, Standard Guide for the Use of the Joint API and ASTM Adjunct for Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils: API MPMS Chapter 11.1, shall not exceed 0.1% for nonautomatic or automatic density-correction system for the total delivered volume.***

The delivered quantities for each test shall be approximately the same size. The results of each test shall be within the applicable acceptance or maintenance tolerance.

[Nonretroactive as if January 1, 202X]

(Added 202X)

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UR.3.6. Temperature Compensation and Volume Correction, Wholesale

UR.3.6.1. Automatic.

UR.3.6.1.1. When to be Used. – If a device is equipped with a mechanical automatic temperature compensator, it shall be connected, operable, and in use at all times. An electronic or mechanical automatic temperature-compensating system may not be removed, nor may a compensated device be replaced with an uncompensated device, without the written approval of the responsible weights and measures jurisdiction.

Note: This requirement does not specify the method of sale for product measured through a meter.

(Amended 1989)

UR.3.6.1.2. Invoices.

(a) A written invoice based on a reading of a device that is equipped with an automatic temperature compensator shall show the net volume delivered and that the volume delivered has been adjusted to the volume at 15 °C (60 °F).

(b) The invoice issued from an electronic wholesale device equipped with an automatic temperature-compensating system shall also indicate **for each metered component or the finished product:**

(1) the API gravity, specific gravity, or coefficient of expansion ~~for the product;~~

(2) ~~product~~-temperature(s); and

(3) gross reading.

(c) For gasoline-ethanol blends, the invoice issued from a wholesale system equipped with an automatic density correction system, in addition to the requirements in (b) above, shall indicate:

(1) the additional volume due to density correction for the finished product; and

(2) the net volume inclusive of the additional volume due to density correction.

Note: Shall include the statement, “Volume delivered has been adjusted to the volume at 15 °C (60 °F) and for changes in density.”

Nonretroactive

(Added 202X)

UR.3.6.2. Nonautomatic.

UR.3.6.2.1. Temperature Determination. – If the volume of the product delivered is adjusted to the volume at 15 °C (60 °F), the product temperature shall be taken during the delivery in:

(a) the liquid chamber of the meter; or

(b) the meter inlet or discharge line adjacent to the meter; or

(c) the compartment of the receiving vehicle at the time it is loaded.

UR.3.6.2.2. Density Determination. – **If the volume of the product delivered is adjusted for changes in the density of the finished product, then the product density shall be measured, or the product density at base conditions shall be determined in accordance with the current version of ASTM D1250, *Standard Guide for the Use of the Joint API and ASTM Adjunct for Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils: API***

MPMS Chapter 11.1, and applied in the calculation via analysis of each of the base components.

Nonretroactive

(Added 202X)

UR.3.6.2.3. Invoices. The accompanying invoice for a nonautomatic density corrected finished product shall indicate that the net volume of the product delivered has been adjusted for temperature variations to a volume at 15 °C (60 °F). Further, for gasoline-ethanol blends, the invoice shall also indicate for each metered component or the finished product:

(1) the API gravity, specific gravity, or coefficient of expansion;

(2) temperature(s);

(3) gross reading;

(4) additional volume due to density correction for the finished product; and

(5) the net volume inclusive of the additional volume due to density correction.

Note: Shall include the statement, “Volume delivered has been adjusted to the volume at 15 °C (60 °F) and for changes in density”.

Nonretroactive

(Added 202X)