

NCWM

Form 15: Proposal to Amend NIST Handbooks, NCWM Guidance Documents, Bylaws, or Publication 14.

<https://form.jotform.com/240725915978066>

General Information

- **Proposal to:** NCWM L&R Committee
- **Submitter's Name:** [Prentiss Searles - API, et. al.](#)

Proposal Information

- **Purpose:** Concise statement as to the intent or purpose of this proposal, such as a problem being fixed. (Do not include justification here.)
 - [Add requirements to the method of sale for liquid measuring devices that perform temperature compensation and/or density correction.](#)

- **Document to be Amended:** [HB 130](#)

Cite Portion to be Amended (include the section and paragraph):

Submit a separate Form 15 for each code, model law, or regulation to be amended.

- **Proposal:** Proposal Upload (Please upload a Microsoft Word document of your proposal below):

[Modify Handbook 130 to require written invoices for automatic or nonautomatic temperature compensators to show the net volume delivered and that the net volume has been adjusted to the reference temperature 15 °C \(60 °F\). This proposal also adds a requirement that for automatic and nonautomatic density-correction systems, that the invoice show the excess volume for the finished product and the net standard volume inclusive of the excess volume of that finished product to the reference temperature 15 °C \(60 °F\).](#)

- **Justification:** Include national importance, background on the issue, and reference to supporting data or documents.

[Section IV., B. Method of Sale of Commodities, gasoline and gasoline oxygenate blends does not have a requirement for an invoice to include a statement that a calculated volume has been adjusted to a temperature of 15 °C \(60 °F\). The proposed language adds such a requirement.](#)

Handbook 44 allows the use of automatic and nonautomatic temperature compensators to be used to calculate the net volume of the product at a reference temperature, but there is not a requirement in the Method of Sale to reflect that information on the invoice, though it is industry practice to do so. Additionally, due to the fact that the volume of gasoline and ethanol when blended is more than the volume of the two liquids measured separately, a proposal to modify Handbook 44 has been submitted to the NCWM to clarify that it is acceptable to use specific density-correction methods that allow for the accurate determination of volume growth that occurs when gasoline is blended with ethanol to make finished gasoline.

Automatic temperature compensators have been used for decades throughout the United States to calculate the net volume of the fuel being sold at terminals. Including a statement on the invoice to that effect identifies that the calculation has been done.

In 2019, the American Petroleum Institute published a Manual of Petroleum Measurement Standards (MPMS) Chapter 11.3.4, *Miscellaneous Hydrocarbon Properties - Denatured Ethanol and Gasoline Component Blend Densities and Volume Correction Factors*, that identifies multiple blending scenarios to calculate the excess volume that occurs when gasoline and ethanol are blended. Ch. 11.3.4 is a subchapter of the parent document Ch. 11, *Physical Properties Data*.

Ch. 11 is used throughout the petroleum industry to ensure the physical properties of the fuels are properly assessed to ensure that the fuel measured throughout the manufacturing and distribution system is done accurately and transparently using industry recognized standards. Indeed, measurements are taken at the refinery when fuel is moved into a pipeline, when the fuel is moved out of the pipeline into a terminal, and when the fuel is loaded from the terminal into a truck for delivery to a retail gasoline station. A recently released video by NIST states that every drop of fuel “passes through a meticulous system of measurements” from where the crude oil is extracted to the terminal to “prevent costly losses.” [Source: Trust in Transactions: The Economic Power of Data – Moser April 9, 2025, <https://www.nist.gov/pml/owm/weights-and-measures-economic-index>.] The meticulous system of measurements often use API approved standards that are developed by the API Committee on Petroleum Measurement (COPM). Consequently, it is not a stretch to say that it is “firmly established trade custom and practice” to use the API MPMS standards to measure fuels throughout the industry worldwide. [see reference to HB 130, III. Uniform Laws, A. Weights and Measures Law, Section 16, Method of Sale (p. 29)]

The requirements for invoices in Handbook 130 – Section IV., Sec. B. Uniform Regulation for the Method of Sale of Commodities, Paragraph 2.20. Gasoline and Gasoline Oxygenate Blends – are minimal in scope providing only a reference to the U.S. Environmental

Protection Agency (EPA) rules. These rules, summarized below require only the volume of the product being transferred to be identified.

EPA Rules at [40 C.F.R. § 1090.1110](#), PTD requirements for gasoline, gasoline additives, and gasoline regulated blendstocks, paragraph “(a) **General requirements**. On each occasion when any person transfers custody or title of any gasoline, gasoline additive, or gasoline regulated blendstock, other than when fuel is sold or dispensed to the ultimate end user at a retail outlet or WPC facility, the transferor must provide the transferee PTDs that include the following information: (1) All applicable information required under [§ 1090.1100](#) and this section.”
[emphasis added]

Section “[1090.1100 General Requirements](#)” states (a)(1)(iii) a PTD must include a set of information including (iii) “**The volume of the product being transferred.**”
[emphasis added]

This proposed change to HB 130 Method of Sale makes it clear that if the volume of a product is calculated and changed to reflect a change in volume, that the invoice reflects that change and cites the reference temperature.

Today multiple API standards (identified below) ensure accurate and transparent measurement. Further, sales agreements may state that where temperature compensation is used, those calculations incorporate the methods and procedures specified in API MPMS Chapter 11.¹

- Ch. 8.1 Manual Sampling of Petroleum Products (ASTM D4057)
- Ch. 5.x Metering (5.1 General Considerations for Measurement by Meters, with specific chapters that address for displacement meters, turbine meters, Coriolis meters, ultrasonic flow meters, Fidelity and Security of Flow Measurement Pulsed-Data Transmissions Systems)
- Ch. 6.x – Metering Systems (6.1 Metering Assemblies- General Considerations, with specific chapters for - Truck and Rail Loading and Unloading Measurement Systems; - Pipeline and Marine Loading/Unloading Measurement Systems; and Lease Automatic Custody Transfer Systems)
- Ch. 4.x Proving Systems (Displacement Provers, Master-Meter Provers, Field Standard Test Measures, Methods of Calibration for Displacement and

¹ <https://www.api.org/-/media/files/publications/2024-catalog/2024-publication-catalog.pdf>.

Volumetric Tank Provers, Part 1—Introduction to the Determination of the Volume of Displacement and Tank Provers)

- Ch. 7.4 Dynamic Temperature Measurement
- Ch. 11 Physical Properties Data (ASTM D1250, Adjunct)
 - Chapter 11.1 - Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils
 - Ch. 11.3.3 Miscellaneous Hydrocarbon Product Properties—Denatured Ethanol Density and Volume Correction Factors
 - Ch. 11.3.4 Miscellaneous Hydrocarbon Properties - Denatured Ethanol and Gasoline Component Blend Densities and Volume Correction Factors
 - Ch. 11.4.1 Density of Water and Water Volumetric Correction Factors for Water Calibration of Volumetric Provers
- Ch. 12.2 Calculation of Petroleum Quantities using Dynamic Measurement Methods and Volumetric Correction Factors
- Ch. 21.2 Electronic Liquid Measurement Using Positive Displacement and Turbine Meters

Why should we use and accept API standards? Handbook 130, Uniform Weights and Measures Law, Section 16, recognizes “firmly established trade custom and practice” that dictate how liquid fuels are sold. Specifically, it states,

Section 16. Method of Sale

Except as otherwise provided by the Director or by firmly established trade custom and practice,

(a) commodities in liquid form shall be sold by liquid measure or by weight;
and

(b) commodities not in liquid form shall be sold by weight, by measure, or by count.

The method of sale shall provide accurate and adequate quantity information that permits the buyer to make price and quantity comparisons.

(Amended 1989)

In 2024, the U.S. customers consumed 137 billion gallons of gasoline (most of which was 10% ethanol) and 63 billion gallons of diesel fuel. Another 24 billion gallons of jet fuel were consumed in the U.S. At each stage of the process from producing the crude oil to selling the finished fuel to a retail gasoline station the product is measured. So, while there is over 224 billion gallons of finished product consumed in the U.S., those molecules have likely been measured many times over. These measurements are so important that the API Committee on Petroleum Measurement (COPM) meets twice a year, with over 700 people in attendance, at each meeting to review the standards that are used in the U.S. and around the world. By definition, the petroleum industry uses the API standards which are firmly established trade custom and practice.

- **Possible Opposing Arguments:** Demonstrate that you are aware and have considered possible opposition.

Some have raised concerns that metering systems should not modify the volume of the product after it has gone through the custody meter. This concern appears to be premised on the belief that the gross volume **and** the net standard temperature compensated volume are measured. In practice, the only measured volume is the gross volume and that is measured by counting pulses from the meter in accordance with an API standard. The gross volume is then used by the custody transfer system or the automatic terminal management system to calculate the net volume using another set of API standards including Chapters 5.x, 6x, 7.4, 11.1, 11.3.3, 11.3.4, 12.2, and 21.2. Please see above for the names of these standards.

Some have indicated that HB 130, IV. Uniform Regulations, A. Uniform Packaging and Labeling Regulation, Paragraphs 7.4.(b) and 7.5.(b) may already include a requirement.

7.4. SI Units: Mass, Measure.

(b) in units of liquid measure shall be in terms of the liter or milliliter, and shall express the volume at 20 °C, except in the case of petroleum products or distilled spirits, for which the declaration shall express the volume at 15.6 °C, and except also in the case of a commodity that is normally sold and consumed while frozen, for which the declaration shall express the volume at the frozen temperature, and except also in the case of malt beverages or a commodity that is normally sold in the refrigerated state, for which the declaration shall express the volume at 4 °C;

(Amended 1985)

7.5 U.S. Customary Units: Weight, Measure.

(b) in units of liquid measure shall be in terms of the United States gallon of 231 cubic inches or liquid quart, liquid pint, or fluid ounce subdivisions of the gallon and shall express the volume at 68 °F, except in the case of petroleum products or distilled spirits, for which the declaration shall express the volume at 60 °F, and except also in the case of a commodity that is normally sold and consumed while frozen, for which the declaration shall express the volume at the frozen temperature, and except also in the case of a commodity that is normally sold in the refrigerated state, for which the declaration shall express the volume at 40 °F, and except also in the case of malt beverages, for which the declaration shall express the volume at 39.1 °F;

(Amended 1985)

- **Requested Action if Considered for NCWM Agenda:** If you chose other in the previous question please describe:
 - Voting Item
 - Developing Item
 - Informational Item
 - Other
- **List of attachments:**