

## Addendum Sheet

### Specifications and Tolerances (S&T) Committee Interim Report

Mr. Brad Bachelder, Committee Chair  
Maine

#### INTRODUCTION

The S&T Committee (hereinafter referred to as the “committee”) submits its Committee Interim Report for consideration by National Conference on Weights and Measures (NCWM). This addendum sheet contains the report items published in *NCWM Publication 16, Committee Reports for the 107<sup>th</sup> Annual Meeting*. The addendum sheet will address the following items during the Annual Meeting.

Items are grouped according to item status: **(VC) Voting Consent Calendar:** the committee has grouped these items for a single vote; **(V) Voting Item:** the committee is making recommendations requiring a vote by the active members of NCWM; **(I) Informational Item:** the item is under consideration by the committee but not proposed for Voting; **(A) Assigned Item:** the committee has assigned development of the item to a recognized subcommittee or task group within NCWM; **(D) Developing Item:** the committee determined the item has merit; however, the item was returned to the submitter or other designated party for further development before any action can be taken at the national level; **(W) Withdrawn Item:** the item has been removed from consideration by the committee.



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**Details of All Items**  
*(In order by Reference Key)*

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**GEN – GENERAL CODE**

**GEN-22.1      V      G.A.1. Commercial and Law-Enforcement Equipment.**

**G-A.1. Commercial and Law-Enforcement Equipment.** – These specifications, tolerances, and other technical requirements apply as follows.

**(1) To commercial weighing and measuring equipment; that is:**

(a) To weights and measures and weighing and measuring devices ~~commercially~~ used or employed ~~in~~:

**1. in** establishing the size, quantity, extent, area, composition (limited to meat and poultry), constituent values (limited to grain), or measurement of quantities, things, produce, or articles for distribution or consumption, purchased, offered, or submitted for sale, hire, or award;

**2. when assessing a fee for the use of the equipment to determine a weight or measure;**

**3. in determining the basis of an award using count, weight, or measure; or**

**4. in** computing any basic charge or payment for services rendered on the basis of weight or measure.

(Amended 2008 ~~and 20XX~~)

(b) To any accessory attached to or used in connection with a commercial weighing or measuring device when such accessory is so designed that its operation affects the accuracy of the device.

**(2)** To weighing and measuring equipment in official use for the enforcement of law or ~~for~~ the collection of statistical information by government agencies.

(These requirements should be used as a guide by the weights and measures official when, upon request, courtesy examinations of noncommercial equipment are made.)

The Committee agreed with the changes in open hearing and worked with the Laws and Regulations Committee to harmonize the language in both items. The Committee recommends the above language to replace the item under consideration in Publication 16.

**GEN-19.1      D      G-T.5. Tolerances on Tests When Transfer Standards are Used., Appendix A, Section 3.2. Tolerances for Standards., and Appendix D – Definitions: standards, field., transfer standard, and standard, transfer,**

This item was modified and combined with Item OTH-22.1 and resides in Block 8.

## **SCL – SCALES**

**SCL-20.9                      W    S.1.1.3. Zero Indication, Load Receiving Elements Separate from Weighing Elements. and Appendix D – Definitions: no load reference value**

No Changes.

**SCL-22.2                      A    UR.1. Selection Requirements, UR.1.X. Cannabis**

No Changes.

## **LMD – LIQUID MEASURING DEVICES**

**LMD-21.1                      VC   Table S.2.2. Categories of Device and Method of Sealing**

**Source:**

The committee recommends no change to this item.



LMD-22.1

**VC Table T.2. Accuracy Classes and Tolerances for Liquid Measuring Devices Covered in NIST Handbook 44, Section 3.30**

<b>Table T.2.</b>  <b>Accuracy Classes and Tolerances for Liquid Measuring Devices Covered in</b>  <b>NIST Handbook 44, Section 3.30.</b>				
<b>Accuracy Class</b>	<b>Application</b>	<b>Acceptance Tolerance</b>	<b>Maintenance Tolerance</b>	<b>Special Test Tolerance<sup>1</sup></b>
0.3	<ul style="list-style-type: none"> <li>- Petroleum products delivered from large capacity (flow rates greater than 115 L/min or 30 gpm)** devices, including motor-fuel devices</li> <li>- Heated products (other than asphalt) at temperatures greater than 50 °C (122 °F)</li> <li>- Asphalt at temperatures equal to or below 50 °C (122 °F)</li> <li>- All other liquids not shown in the table where the typical delivery is over 200 L (50 gal)</li> </ul>	0.2 %	0.3 %	0.5 %
0.3A	<ul style="list-style-type: none"> <li>- Asphalt at temperatures greater than 50 °C (122 °F)</li> </ul>	0.3 %	0.3 %	0.5 %
0.5*	<ul style="list-style-type: none"> <li>- Petroleum products delivered from small capacity (at 4 L/min (1 gpm) through 115 L/min or 30 gpm)** motor-fuel devices</li> <li>- Agri-chemical liquids</li> <li>- All other applications not shown in the table where the typical delivery is ≤ 200 L (50 gal)</li> </ul>	0.3 %	0.5 %	0.5 %
1.1	<ul style="list-style-type: none"> <li>- Petroleum products and other normal liquids from devices with flow rates** less than 1 gpm.</li> <li>- Devices designed to deliver less than 1 gal</li> </ul>	0.75 %	1.0 %	1.25 %
<p>* For test drafts ≤ 40 L or 10 gal, the tolerances specified for Accuracy Class 0.5 in the table above do not apply. For these test drafts, the following applies:</p> <p>(a) Maintenance tolerances on normal and special tests shall be 20 mL plus 4 mL per indicated liter or 1 in<sup>3</sup> plus 1 in<sup>3</sup> per indicated gallon.</p> <p>(b) Acceptance tolerances on normal and special tests shall be one-half the maintenance tolerance values.</p> <p><sup>1</sup> Special test tolerances are not applicable to retail motor fuel <b>and retail Diesel Exhaust Fluid (DEF)</b> dispensers.</p> <p>** Flow rate refers to designed or marked maximum flow rate.</p>				

(Added 2002) (Amended 2006 and 2013)

The Committee believes adding the words “Diesel Exhaust Fluid” in front of the acronym “DEF” in Section 3.30 in the title of paragraph N.4.2.2. is editorial in nature and should be made in the next edition of NIST Handbook 44. The Committee recommends the above language to replace the item under consideration in Publication 16.

## VTM – VEHICLE TANK METERS

**VTM-18.1**      **V**    **S.3.1 Diversion of Measured Liquid and S.3.1.1. Means for Clearing the Discharge Hose and UR.2.6. Clearing the Discharge on a multiple-product, single discharge hose.**

The Committee heard in open hearings that some commenters were in favor of making the item retroactive. The committee also recognized comments from previous meetings that time may be needed to facilitate the changes required. The Committee recommends no change to the item under consideration in Publication 16.

**VTM-20.2**      **A**    **Table T.2. Tolerances for Vehicle Mounted Milk Meters.**

No Changes.

## LPG – LIQUIFIED PETROLEUM GAS AND ANHYDROUS AMMONIA LIQUID-MEASURING DEVICES

**LPG-22.1**      **VC**    **A.1. General., and Appendix D – Definitions. Liquefied Petroleum Gas Retail Motor Fuel Device.**

No Changes.

**LPG-15.1**      **D**    **N.3. Test Drafts.**

No Changes.

**LPG-22.2**      **W**    **S.2.6. Zero-Set-Back Interlock, for Stationary Customer-Operated Retail Motor-Fuel Devices, Electronic.**

No Changes.

**LPG-22.3**      **D**    ***S.2.5. Zero-Set-Back Interlock., S.2.5.2. Zero -Set-Back Interlock for Stationary Customer -Operated Electronic Retail Motor-Fuel Devices.***

No Changes.

## MFM – MASS FLOW METERS

MFM-15.1            D    N.3. Test Drafts.

No Changes.

MFM-22.1            VC   Table T.2. Accuracy Classes and Tolerances for Mass Flow Meters.

No Changes.

## EVF – ELECTRIC VEHICLE FUELING SYSTEMS

EVF-21.1            D    A.1. General

No Changes.

EVF-20.1            V    S.1.3.2. EVSE Value of the Smallest Unit.

### S.1.3.    EVSE Units.

**S.1.3.1.    EVSE Units of Measurement.** – EVSE units used to charge electric vehicles shall be indicated and recorded in ~~megajoules (MJ) or~~ kilowatt-hours (kWh) and decimal subdivisions thereof.

**(Amended 202X)**

**S.1.3.2.    EVSE Value of Smallest Unit.** – The value of the smallest unit of indicated delivery by an EVSE, and recorded delivery if the EVSE is equipped to record, ~~shall be 0.005 MJ or 0.001 kWh.:~~

**(a) for AC systems shall not exceed 0.0001 kWh;**

**(b) for DC systems shall not exceed 0.001 kWh; and**

**(c) the value of the kWh shall be expressed only as a decimal submultiple of 1 that**

satisfy (a) and (b).

**(Amended 202X)**

The Committee received a memo from the NIST USNWG EVF subgroup requesting the item under consideration be replaced by the above paragraphs. The Committee in its deliberations also removed megajoules from S.1.3.1. EVSE Units of Measurement to make it consistent with S.1.3.2. The Committee recommends the other items mentioned in the memo be presented in a Form 15 because the Committee felt it went beyond the scope of the original item and were technically substantial changes.

**EVF-21.5            D    T.2. Load Test Tolerances.**

No Changes.

**TXI – TAXIMETERS**

**TXI-22.1            VC   Table S.5. Categories of Device and Methods of Sealing**

No Changes.

**GMA – GRAIN MOISTURE METERS 5.56 (A)**

**GMA-19.1            D    Table T.2.1. Acceptance and Maintenance Tolerances Air Oven Method for All Grains and Oil Seeds.**

No Changes.

**MDM – MULTIPLE DIMENSION MEASURING DEVICES**

**MDM-22.1            D    S.1.7. Minimum Measurement.**

No Changes.

## **OTH – OTHER ITEMS**

**OTH-16.1            D    Electric Watthour Meters Code under Development**

No Changes.

**OTH-22.1            D    Appendix A: Fundamental Considerations, 3. Testing Apparatus**

This item was modified and combined with Item GEN-19.1 and resides in Block 8.

**OTH-22.2            VC   Appendix D – Definitions: face**

No Changes.

## **ITEM BLOCK 1 (B1)            TERMINOLOGY FOR TESTING STANDARDS**

**B1: SCL-18.1        W    N.2. Verification (Testing) Standards**

No Changes.

**B1: ABW-18.1        W    N.2. Verification (Testing) Standards**

No Changes.

**B1: AWS-18.1        W    N.1.3. Verification (Testing) Standards, N.3.1. Official Tests, UR.4. Testing Standards**

No Changes.

**B1: CLM-18.1        W    N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards**

No Changes.

**B1: CDL-18.1        W    N.3.2. Transfer Standard Test, T.3. On Tests Using Transfer Standards**

No Changes.

**B1: HGM-18.1**      **W**      **N.4.1. Master Meter (Transfer) Standard Test, T.4. Tolerance Application on Test Using Transfer Standard Test Method**

No Changes.

**B1: GMA-18.1**      **W**      **5.56(a): N.1.1. Air Oven Reference Method Transfer Standards, N.1.3. Meter to Like-Type Meter Method Transfer Standards and 5.56(b): N.1.1. Transfer Standards, T. Tolerances<sup>1</sup>**

No Changes.

**B1: LVS-18.1**      **W**      **N.2. Testing Standards**

No Changes.

**B1: OTH-18.1**      **W**      **Appendix A: Fundamental Considerations, 3.2. Tolerances for Standards, 3.3. Accuracy of Standards**

No Changes.

**B1: OTH-18.2**      **W**      **Appendix D – Definitions: fifth-wheel, official grain samples, transfer standard and Standard, Field**

No Changes.

## **BLOCK 2 ITEMS (B2)      DEFINE TRUE VALUE FOR USE IN ERROR CALCULATIONS**

No Changes.

**B2: SCL-20.3**      **A**      **S.5.4. Relationship of Minimum Load Cell Verification Interval to the Scale Division**

No Changes.

**B2: SCL-20.4**      **A**      **Table 3. Parameters of Accuracy Classes.**

No Changes.

**B2: SCL-20.5      A      Table S.6.3.a. Marking Requirements, Note 3.**

No Changes.

**B2: SCL-20.6      A      T.N.1.2. Accuracy Classes and T.N.1.3. Scale Division.**

No Changes.

**B2: SCL-20.7      A      Table 6. Maintenance Tolerances**

No Changes.

**B2: SCL-20.8      A      Table 8. Recommended Minimum Load**

No Changes.

**BLOCK 3 ITEMS (B3) TOLERANCES FOR DISTANCE TESTING IN TAXIMETERS  
AND TRANSPORTATION NETWORK SYSTEMS**

**B3: TXI-20.1      D      T. Tolerances**

No Changes.

**B3: TNS-20.1      D      T. Tolerances**

No Changes.

**BLOCK 4 ITEMS (B4) ELECTRONICALLY CAPTURED TICKETS OR RECEIPTS**

**B4: GEN-21.2      D      G-S.5.6. Recorded Representations.**

No Changes.

**B4: LMD-21.2      D      S.1.6.5. Money Value Computations., UR.3. Use of a Device.**

No Changes.

**B4: VTM-21.1      D      S.1.1. Primary Elements., UR.2. User Requirements**

No Changes.

**B4: LPG-21.1      D      S.1.1. Primary Elements., UR.2. User Requirements**

No Changes.

**B4: CLM-21.1      D      S.1.4.1. ~~Printed Ticket~~Recorded Representation., UR.2.6.3. ~~Printed Ticket~~Recorded Representation.**

No Changes.

**B4: MLK-21.1      D      S.1.4.2. ~~Printed Ticket~~ Recorded Representation., UR.2.6.3. ~~Printed Ticket~~Recorded Representation.**

No Changes.

**B4: MFM-21.2      D      S.6. ~~Printer~~Recorded Representations., UR.2.6. ~~Ticket Printer, Customer Ticket,~~  
Recorded Representation., UR.3.4. ~~Printed Ticket.~~ Recorded Representation.**

No Changes.

**B4: CDL-21.1      D      S.1.4.1. ~~Printed Ticket~~Recorded Representations., UR.2.4.2. ~~Tickets or Invoices.~~  
Recorded Representation.**

No Changes.

**B4: HGM-21.1      D      S.2.6. Recorded Representations, Point of Sale Systems., S.6. Printer. Recording  
Element., UR.3.2. Vehicle-mounted Measuring Systems Ticket Printer Recording  
Element., UR.3.3. Printed Ticket. Recorded Representation.**

No Changes.

**B4: OTH-21.2      D      Appendix D - Definitions.: recorded representations, recording element.**

No Changes.



**ITEM BLOCK 5 (B5) DEFINE “FIELD REFERENCE STANDARD”**

**B5: CLM-18.2 W N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards**

No Changes.

**B5: CDL-18.2 W N.3.2. Transfer Standard Test and T.3. On Tests Using Transfer Standards**

No Changes

**B5: HGM-18.2 W N.4.1. Master Meter (Transfer) Standard Test and T.4. Tolerance Application on Test Using Transfer Standard Test Method**

No Changes.

**B5: OTH-18.3 W Appendix D – Definitions: field reference standard meter ~~and transfer standard~~**

No Changes.

**BLOCK 6 ITEMS (B6) COMMERCIAL AND LAW ENFORCEMENT, AXLE AND AXLE GROUP WEIGHTS**

**B6: SCL-22.1 D Recorded Representation of Axle or Axle Group Weights**

No Changes.

**B6: SCL-22.3 D UR.3.3. Single-Draft Vehicle Weighing., and UR.3.4. Axle and Axle Group Weight Values.**

No Changes.

## **BLOCK 7 ITEMS (B7) TOLERANCES ON TESTS USING TRANSFER STANDARDS**

**B7: CLM-22.1      D      T.3. On Tests Using Type 2 Transfer Standards.**

No Changes.

**B7: CDL-22.1      D      T.3. On Tests Using Type 2 Transfer Standards.**

No Changes.

**B7: HGM-22.1      D      T.4. Tolerance Application on Tests Using Type 2 Transfer Standard Test Method.**

No Changes.

## **BLOCK 8 ITEMS (B8) TOLERANCES ON TESTS USING TRANSFER STANDARDS, APPENDIX A - TOLERANCES FOR STADARDS, AND APPENDIX D – FIELD STANARDS AND TRANSFER STANDARDS**

No Changes.

**B8: GEN-19.1      D      G-T.5. Tolerances on Tests When Transfer Standards are Used., Appendix A,  
Section 3.2. Tolerances for Standards., and Appendix D – Definitions: standards,  
field., transfer standard, and standard, transfer.**

No Changes.

**B8: OTH-22.1      D      Appendix A: Fundamental Considerations, 3. Testing Apparatus**

No Changes.

**EVFS-PRIORITY      V      Remove Tentative Status of Section 3.40: EVFS Code**

**Section 3.40. V      Electric Vehicle Fueling Systems – ~~Tentative Code~~ ..... 3-153**

**Section 3.40.      Electric Vehicle Fueling Systems – Tentative Code**

This code was changed from tentative to permanent status effective January 1, 2023.

~~This tentative code has a trial or experimental status and is not intended to be enforced. The requirements are designed for study prior to the development and adoption of a final code. Officials wanting to conduct an official examination of an Electric Vehicle Supply Equipment (EVSE) or system are advised to see paragraph G-A.3. Special and Unclassified Equipment.~~  
(Tentative Code Added 2015)

**The status of Section 3.40. Electric Vehicle Fueling Systems was changed from “tentative” to “permanent” effective January 1, 2023. (Added 2015) (Amended 2022)**

## **S. Specifications**

**S.2.7. Indication of Delivery.** – The EVSE shall automatically show on its face the initial zero condition and the quantity delivered (up to the capacity of the indicating elements).

**All DC EVSE are exempt from this requirement until January 1, 2028.**

## **N. Notes**

N.5. Test of an EVSE System.

**N.5.2. Accuracy Testing.** – The testing methodology compares the total energy delivered in a transaction and the total cost charged as displayed/reported by the EVSE with that measured by the measurement standard.

(b) For DC systems (see note):

- (1) Accuracy test of the EVSE system at a load of not less than 85 % of the maximum deliverable amperes current (expressed as MDA) as determined from the digital communication message from the DC EVSE to the test standard for a total energy delivered of at least twice the minimum measured quantity (MMQ).
- (2) Accuracy test of the EVSE system at a load of not more than 10 % of the maximum deliverable amperes (expressed as MDA) as determined from the digital communication message from the DC EVSE to the test standard for a total energy delivered of at least the minimum measured quantity (MMQ).

**All DC EVSE are exempt from this requirement until January 1, 2028.**

Note: For DC systems it is anticipated that an electric vehicle may be used as the test load. Under that circumstance, testing at the load presented by the vehicle shall be sufficient.

## **T. Tolerances**

**T.2. Load Test Tolerances.**

**T.2.1. EVSE Load Test Tolerances.** – The tolerances for EVSE load tests for are:

- (a) Acceptance Tolerance: 1.0 %; and
- (b) Maintenance Tolerance: 2.0 %.

**All DC EVSE are exempt from this requirement until January 1, 2028.**

Discussion:

The Committee added the following statement;

**All DC EVSE are exempt from this requirement until January 1, 2028.**

to paragraphs S.2.7. Indication of delivery, N.5.2. Accuracy Testing, T.2. Load Test Tolerances

There was an urgency to remove the tentative status from this code. However, the committee heard from stakeholders that DC EVSE should be exempt for a period of time from the above mentioned paragraphs for more development of technology and testing methods. Commenters were also unsure how the proposed term “effective” would be applied given the terms retroactive and non-retroactive are most commonly used in the handbook. Consequently the committee chose to modify the statement based on comments from the floor.

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Mr. Brad Bachelder, Maine | Committee Chair  
Mr. Jason Glass, Kentucky | Vice-Chair  
Mr. Nick Owens, Stark County, Ohio | Member  
Mr. Jason Flint, New Jersey | Member  
Mr. David Aguayo, San Luis Obispo County, California | Member  
Mr. Louis Martinet, Measurement Canada | Canadian Technical Advisor  
Mr. Richard Harshman, NIST OWM | NIST Technical Advisor  
Ms. G. Diane Lee, NIST, OWM | NIST Technical Advisor  
Ms. Juana Williams, | NIST Technical Advisor  
Mr. Allen Katalinic, NCWM | NTEP Technical Advisor

**Specifications and Tolerances Committee**