

Introduction and Welcome

- i. **Introductions and Welcome** (*R. Kennington*)
- ii. **Reiteration of NTEP MDMD Work Group Mission** (*D. Flocken*)
- iii. **Report – 2018 NCWM Interim Meeting** (*D. Flocken*)

During the NCWM, Interim Meeting in July 2018, the following proposal was given a Developing status. Members of this Work Group should track the activity of this proposal.

S.1.11. Provision for Sealing. - For devices and systems in which the configuration or calibration parameters can be changed by use of a removable digital storage device, security shall be provided for those parameters as specified in G-S.8.2. For parameters adjusted using other means, the following applies:

- (a) **A The device or system** shall be designed with provision(s) for applying a security seal that must be broken, or for using other approved means of providing security (e.g., data change audit trail available at the time of inspection), before any change that detrimentally affects the metrological integrity ~~of the device~~ can be made to any measuring element.

- iv. **Report – Recent Measurement Canada Type Evaluation Activity** (*P. Trugeon*)
- v. **Report – Recent NTEP MDMD Type Evaluation Activity** (*T. Buck*)

Carry Over Items

1. Review meeting summary from May 2017 meeting

A copy of the May 2017 Meeting Summary can be downloaded at www.ncwm.net/ntep/sectors/mdmd/archive. Please bring a copy of the summary with you to the meeting.

2. Review changes to NIST, Handbook 44, MDMD code since last meeting

During the NCWM, Annual Meeting in July 2017, the following proposals were adopted into Handbook 44.

S.1.7. Minimum Measurement Lengths. – Except for entries of tare, the minimum measurement length to be measured by a device is 12 ~~d~~ divisions. The manufacturer may specify a longer minimum measurement length. **For multi-interval devices, this applies only to the first measuring segment.**

S.1.8. Indications Below Minimum and Above Maximum. – When objects are smaller than the minimum dimensions identified in paragraph S.1.7. Minimum Measurement Lengths or larger than any of the maximum dimensions plus 9 d, and/or maximum volume marked on the device plus 9 d, or when a combination of dimensions, **including tare**, for the object being measured exceeds the measurement capability of the device, the indicating or recording element shall either:

3. Review changes to NCWM, Publication 14, MDMD Checklist

The following change, as agreed to during the May 2017 MDMD Work Group meeting, was made to the MDMD Checklist in the 2018 edition of Publication 14:

Removed reference to a requirement involving a “live” display in sentence 3.5.

No other changes were made.

4. Review changes to Measurement Canada MDMD Code, and Terms and Conditions Documents

Discussion, as needed, regarding any changes to the Canadian MDMD Code since the Work Group's May 2017 meeting.

- 4.1. MC's decision to allow Cubetape PRO and Cubetape POS from Parcel Tools to be used in trade without being approved;
- 4.2. MC's decision on printed information required when requested by the Customer; and
- 4.3. Status on external consultation on MDMD Terms and Conditions.

5. Review OIML Activity Related to R129 CD2

Discussion, as needed, regarding activity of the OIML Committee responsible for revising the International Recommendation 129 for MDMD instruments

6. Review update to NTEP / MC Requirements Comparison Document

Source: Work Group

Status: The NTEP / Measurement Canada Requirements Comparison document is unchanged since the Work Group's September 2015 meeting. A copy of the document is available on the NCWM website in the MDMD Work Groups, Meeting Archives.

Recommendation: Review and determine if any NTEP or Measurement Canada changes to regulations or requirements impact the contents of this document.

7. Publication 14, MDMD Checklist

- 7.1. At the May 2017 meeting, a work group was created to review and make any recommendations for changes to Publication 14 based on the adopted changes to Handbook 44 at the NCWM's, 2016 annual meeting. The work group was also charged with developing a recommendation for any changes to Publication 14 based on the adoption of a proposal for a change to Handbook 44, up for adoption during the NCWM's, 2017 annual meeting. Note: the proposed item was adopted during the NCWM's, 2017 annual meeting.

7.1.1.a. Item 1 - as adopted:

S.1.5. Value of Dimension /Volume Division Units. – The value of a device division "d" expressed in a unit of dimension shall be presented in a decimal format. The value of "d" for each measurement axis shall be in the same unit of measure and expressed as:

....

The subgroup reviewed the contents of Publication 14, 2017 edition and found the current wording.

3. Indicating and Recording Elements – General

....

Code Reference S.1.5.

....

3.10 Displayed and printed values of length, width, and height must be in the same unit of measure.

While this statement does not specifically mention the value of "d", the requirement that all measurement values must be in the same unit of measure implies that "d" must satisfy this specification.

Recommendation:

The subgroup recommends modifying sentence 3.10 by adding examples of units of measures as shown below.

3.10 Displayed and printed values of length, width, and height must be in the same unit of measure (e.g. cm, in, etc).

7.1.1.b. Item 2 - as adopted:

Table S.4.1.a. Marking Requirements for Multiple Dimension Measuring System				
To Be Marked With	Multiple Dimension Measuring Equipment			
	Multiple Dimensions Measuring Device and Indicating Element in Same Housing	Indicating Element Not Permanently Attached to Multiple Dimension Measuring Element	Multiple Dimension Measuring Element Not Permanently Attached to the Indicating Element	Other Equipment (1)
Manufacturer's ID	X	X	X	X
Model Designation	X	X	X	X
Serial Number and Prefix	X	X	X	X (2)
Certificate of Conformance Number (8)	X	X	X	X (8)
Minimum and Maximum Dimensions for Each Axis (3)(9)	X	X	X	
Value of Measuring Division, d (for each axis and range) (9)	X	X	X	
Temperature Limits (4)(9)	X	X	X	
Minimum and Maximum Speed (5)(9)	X	X	X	
Special Application (6)(9)	X	X	X	
Limitation of Use (7)(9)	X	X	X	

(Amended 2016)

Table S.4.1.b. Multiple Dimension Measuring Systems Notes for Table S.4.a.	
1.	Necessary to the dimension and/or volume measuring system, but having no effect on the measuring value (e.g., auxiliary remote display, keyboard, etc.)
2.	Modules without "intelligence" on a modular system (e.g., printer, keyboard module, etc.) are not required to have serial numbers.
3.	The minimum and maximum dimensions and measuring division (using upper and lower case type) shall be marked. For example: Length: min ___ max ___ d ___ Width: min ___ max ___ d ___ Height: min ___ max ___ d ___
4.	Required if the range is other than -10 °C to 40 °C (14 °F to 104 °F.)
5.	Multiple dimension measuring devices, which require that the object or device be moved relative to one another, shall be marked with the minimum and maximum speeds at which the device is capable of making measurements that are within the applicable tolerances.
6.	A device designed for a special application rather than general use shall be conspicuously marked with suitable words visible to the operator and the customer restricting its use to that application.
7.	Materials, shapes, structures, combination of object dimensions, speed, spacing, minimum protrusion size, or object orientations that are inappropriate for the device or those that are appropriate.
8.	Required only if a Certificate of Conformance has been issued for the equipment.
9.	<u>This marking information may be readily accessible via the display. Instructions for displaying the information shall be described in the NTEP CC.</u> <u>(Amended 2016)</u>

The subgroup reviewed the contents of Publication 14, 2017 edition and found a copy of Tables S.4.1.a. and S.4.1.b.

Recommendation:

The subgroup recommends that Tables S.4.1.a. and S.4.1.b., located on page MDMD-6 of Publication 14, 2017 edition, be revised to include the new Note 9 in Table S.4.1.b. and the 6 references to Note 9 in Table S.4.1.a. as adopted into Handbook 44.

NOTE: During the review of the information in Pub 14, it was noted that the Table S.4.1.a and the accompanying Footnotes do not match the information in the table in Handbook 44 and its accompanying notes. The sub-group recommends that the table and footnotes in Pub 14 be updated to match the information in Handbook 44. In addition, the subgroup recommends removing the "Editor's Note" located directly after the table in Pub 14.

7.1.1.c. Item 3 - as adopted:

S.2.2. Tare. – The tare function...

S.2.2.1. Maximum Value of Tare for Multi-Interval (Variable Division-Value) Devices. – **A multi-interval device shall not accept any tare value greater than the maximum capacity of the lowest range of the axis for which the tare is being entered.**

(Added 2016)

S.2.2.2. Net Values, Mathematical Agreement. - All net values resulting from a device subtracting a tare entry from a gross value indication shall be indicated and recorded, if so equipped, to the nearest division of the measuring range in which the net value occurs. In instances where the tare value entered on a multi-interval device is in a lower partial measuring range (or segment) than the gross indication, the system shall either alter the tare entered or round the net result after subtraction of the tare in order to achieve correct mathematical agreement.

The following example (of a multi-interval device having two partial measuring ranges for the “x” axis) and accompanying two tables are provided to further clarify the two acceptable methods a device can use to achieve mathematical agreement when tare has been entered in a lower partial measuring range than the gross indication:

Example multi-interval device having two partial measuring ranges for the “x” axis:

- **Partial measuring range 1: 0 – 100 inches by 0.2 inch**
- **Partial measuring range 2: 100 – 300 inches by 0.5 inch**

Table 1: Examples of Acceptable Altering of Tare to Achieve Accurate Net Indication

<u>Gross Indication of Item Being Measured</u>	<u>Tare Entered</u>	<u>Value of Tare after Being Altered by the Device</u>	<u>Acceptable Net Indication</u>
<u>154.5 inches</u>	<u>41.2 inches</u>	<u>41.0 inches</u>	<u>113.5 inches</u>
<u>154.5 inches</u>	<u>41.4 inches</u>	<u>41.5 inches</u>	<u>113.0 inches</u>

Table 2: Examples of Acceptable Rounding of the Net Result (Following the Subtraction of Tare) to Achieve Accurate Net Indication

<u>Gross Indication of Item Being Measured</u>	<u>Tare Entered</u>	<u>Net Result Before Rounding (Gross Indication Minus Tare Entered)</u>	<u>Acceptable Net Indication Rounded to Nearest 0.5 inch</u>
<u>154.5 inches</u>	<u>41.2 inches</u>	<u>113.3 inches</u>	<u>113.5 inches</u>
<u>154.5 inches</u>	<u>41.4 inches</u>	<u>113.1 inches</u>	<u>113.0 inches</u>

(Added 2016)

Amend Table S.4.1.a. Marking Requirements for Multiple Dimension Measuring Equipment as follows:

Table S.4.1.a.				
Marking Requirements for Multiple Dimension Measuring Systems				
To Be Marked With ↓	Multiple Dimension Measuring Equipment			
	Multiple Dimension Measuring Device and Indicating Element in Same Housing	Indicating Element Not Permanently Attached to Multiple Dimension Measuring Element	Multiple Dimension Measuring Element Not Permanently Attached to the Indicating Element	Other Equipment (1)
Manufacturer's ID	x	x	x	x
Model Designation	x	x	x	x
Serial Number and Prefix	x	x	x	x (2)
Certificate of Conformance Number (8)	x	x	x	x (8)
Minimum and Maximum Dimensions for Each Axis for Each Range in Each Axis (3)	x	x	x	
Value of Measuring Division, d (for each axis and range)	x	x	x	
Temperature Limits (4)	x	x	x	
Minimum & Maximum speed (5)	x	x	x	
Special Application (6)	x	x	x	
Limitation of Use (7)	x	x	x	

(Amended 2016)

Amend paragraph T.2.3. Multi-Interval (Variable Division-Value) Devices and add a new paragraph T.2.4. Mixed-interval Devices. as follows:

T.2.3. Multi-interval (Variable Division-Value) Devices. – ~~For multi-interval (variable division-value) devices,~~ When there exists two or more partial measuring ranges (or segments) specified for any of the “dimensioning” axes (length (x), width (y), or height (z)) and the division values corresponding to those partial measuring ranges (or segments) within the same “dimensioning” axis differ, the tolerance values ~~are~~ shall be based on the value of the ~~device~~ division of the range in use.

(Amended 2016)

T.2.4. Mixed-interval Devices. - For devices that measure to a different division value in at least one dimensioning axes and all axes are single range, the tolerance values shall be based on the value of the division of the axis in use.

(Added 2016)

The subgroup reviewed the contents of Publication 14, 2017 edition and recommends the following 4 additions or changes to Publication:

Note: The recommended changes follow the format of the item as presented in the 2017 edition of NIST, Handbook 44 which is slightly different than that shown in the 2016 edition of Publication 16.

Recommendation 1: Add the wording adopted in S.2.2.1. as a new paragraph numbered 8.6.

8.6. Maximum Value of Tare for Multi-Interval (Variable Division-Value) Devices. – A multi-interval device shall not accept any tare value greater than the maximum capacity of the lowest range of the axis for which the tare is being entered.

Recommendation 2: Add the wording adopted in S.2.2.2. as a new paragraph numbered 8.7.

8.7. Net Values, Mathematical Agreement. - All net values resulting from a device subtracting a tare entry from a gross value indication shall be indicated and recorded, if so equipped, to the nearest division of the measuring range in which the net value occurs. In instances where the tare value entered on a multi-interval device is in a lower partial measuring range (or segment) than the gross indication, the system shall either alter the tare entered or round the net result after subtraction of the tare in order to achieve correct mathematical agreement.

Consider a multi-interval device having two partial measuring ranges for the “x” axis:

- Partial measuring range 1: 0 – 100 inches by 0.2 inch
- Partial measuring range 2: 100 – 300 inches by 0.5 inch

The following examples clarify the two acceptable methods this device can use to achieve mathematical agreement when tare has been entered in a lower partial measuring range than the gross indication:

Acceptable Example 1.			
Altering of a Tare Entry to Achieve Accurate Net Indication			
<u>Gross Indication of Item Being Measured</u>	<u>Tare Entered</u>	<u>Value of Tare after Being Altered by the Device</u>	<u>Acceptable Net Indication</u>
<u>154.5 inches</u>	<u>41.2 inches</u>	<u>41.0 inches</u>	<u>113.5 inches</u>
<u>154.5 inches</u>	<u>41.4 inches</u>	<u>41.5 inches</u>	<u>113.0 inches</u>

Acceptable Example 2.			
Rounding of the Net Result (Following the Subtraction of Tare) to Achieve Accurate Net Indication			
<u>Gross Indication of Item Being Measured</u>	<u>Tare Entered</u>	<u>Net Result Before Rounding (Gross Indication Minus Tare Entered)</u>	<u>Acceptable Net Indication Rounded to Nearest 0.5 inch</u>
<u>154.5 inches</u>	<u>41.2 inches</u>	<u>113.3 inches</u>	<u>113.5 inches</u>
<u>154.5 inches</u>	<u>41.4 inches</u>	<u>113.1 inches</u>	<u>113.0 inches</u>

Recommendation 3: Amend Table S.4.1.a. Marking Requirements for Multiple Dimension Measuring Equipment:

Minimum and Maximum Dimensions for Each Axis for Each Range in Each Axis (3)	x	x	x	
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Recommendation 4: Amend the Checklist to align the new application of the tolerance value to Multi-Interval (Variable Division-Value) Devices and the new paragraph T.2.4. Mixed-interval Devices

NOTE: During the review of the MDMD Checklist no mention or reference of the tolerance value or how the tolerance is applied or Multi-Interval or Mixed Interval operation. Should a new section related to the tolerance value and application of the value and information associated with Multi-Interval or Mixed Interval operation be developed and added to Pub 14?

7.1.2. During the NCWM Annual Meeting held in July 2017. The following proposal to revised Handbook 44 was adopted.

The item adopted is to amend NIST Handbook 44, Multiple Dimension Measuring Devices Code as follows:

S.1.7. Minimum ~~Measurement Lengths~~. – Except for entries of tare, the minimum ~~measurement length to be measured~~ by a device is 12 ~~d~~ divisions. The manufacturer may specify a longer minimum ~~measurement length~~. **For multi-interval devices, this applies only to the first measuring segment.**

S.1.8. Indications Below Minimum and Above Maximum. – When objects are smaller than the minimum dimensions identified in paragraph S.1.7. Minimum ~~Measurement Lengths~~ or larger than any of the maximum dimensions plus 9 d, and/or maximum volume marked on the device plus 9 d, or when a combination of dimensions, **including tare**, for the object being measured exceeds the measurement capability of the device, the indicating or recording element shall either:

...

The subgroup reviewed the contents of Publication 14, 2017 edition and found several places where the word “length” is used to define the measurement of the axes. The subgroup recommends the following changes.

Recommendation 1:

16. Measurement Speed Test

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Test procedure:

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10. Place a standard or test object with a length equal to the **maximum ~~measurement length~~** capacity on/in measurement area and observe, and print or record the results.
11. Place a standard or test object with a width equal to the **maximum ~~measurement width~~** capacity on/in measurement area and observe, and print or record the results.
12. Place a standard or test object with a height equal to the **maximum ~~measurement height~~** capacity on/in measurement area and observe, and print or record the results.
13. Place a standard or test object with a length equal to the **minimum ~~measurement length~~** capacity on/in measurement area and observe, and print or record the results.

14. Place a standard or test object with a width equal to the **minimum ~~measurement~~width** capacity on/in measurement area and observe, and print or record the results.
15. Place a standard or test object with a height equal to the **minimum ~~measurement~~height** capacity on/in measurement area and observe, and print or record the results.

Recommendation 2: Revise Footnote 6 in Table S.4.1.a. by removing the word “length”

⁶ Multiple dimension measuring devices, which require that the object or device be moved relative to one another, shall be marked with the ~~length~~ minimum and maximum speeds at which the device is capable of making measurements that are within the applicable tolerances.

8. Report on progress from multi-interval operation requirements subgroup

Source: Multi-Interval Operation Requirements Subgroup

Background /Discussion: During the October 2014 meeting the work group agreed to form a small subgroup charged with the task to develop requirements that address multi-interval operation for inclusion into both HB-44 and Pub 14. Members of the subgroup are as follows: Mr. Darrell Flocken, Mr. Rick Harshman, Mr. Scott Davidson, Mr. Justin Rae, and Mr. Scott Wigginton.

Recommendation: The Work Group will be updated on their progress.

Status: On going

NEW ITEMS

9. In-motion Forklift based Pallet Dimensioning

Recently, several NTEP Certificates of Conformance have been issued to devices designed to measure palletized freight while being transported (in-motion) on a forklift truck. The Ohio Lab, in conjunction with the device manufacturer, has created a series of tests used during the evaluation. Mike Kelly will lead a discussion on these test procedures and the Work Group members are asked to consider if these tests are appropriate and if they should be added to the Publication 14 Checklist.

10. Misc Items for General Discussion

During recent NTEP evaluations, the Ohio Lab has been asked to evaluate a few device features and /or functions. These included:

1. Handheld Device.
2. Manual entry of a measurement value.
3. Tare value entry.

Mike Kelly will lead a discussion on these test with the Work Group Members regarding these items.

11. Removal of the “Provisional” (P) Status on the NTEP Certificates of Conformance

During the May 2017 MDMD WG meeting the question was raised regarding the removal of the “Provisional” (P) status on existing NTEP Certificates of Conformance (CC). Specifically, what is the determining factor(s) necessary to end the issuing of provisional certificates and what impact would its removal have on current NTEP Certificates of Conformance?

Removal of the Provisional Status is based on the completeness of the Publication 14, checklist for the device; once the WG and the NTEP Administrator agree that the evaluation checklist addresses all requirements as mentioned in the most recent edition of *NIST, Handbook 44*, for the device type, NTEP will begin issuing certificates without the provisional status.

Additional, when the decision is made to stop issuing provisional certificates, NTEP will review all certificates with a provisional status: the review will consist of comparing the features, options, and test conditions, shown on the certificate, to the requirements in the most recent edition of the published checklist. The review would identify any new or changed requirements that were adopted after the issuance of each CC. Any new or changed requirement identified could result in the need for additional testing. The provisional status will be removed after any identified additional testing is successfully completed. If no additional testing is identified, the provisional status will be removed and NTEP will reissue the CC.

For additional information related to provisional certificates, refer to Publication 14, Administrative Policy, Section 12.3 and Section 14

CLOSING DISCUSSION

- 12. Review meeting activities and conclusions**
- 13. Define next steps (if needed)**
- 14. Chairman's discussion**
- 15. Next meeting**

The work group is encouraged to recommend a date and location for the next work group meeting. The recommendation will be presented to the NTEP Committee for review and approval. The work group should maintain, at a minimum, a yearly meeting schedule.