

Multiple Dimension Measuring Device Work Group
October 28-29, 2014 - Reynoldsburg, Ohio
Meeting Agenda

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Schedule

Tuesday, October 28, 2014

- 8:00 AM Meeting Call to Order
- i. **Introductions and Welcome of New Work Group Members** (R. Kennington)
 - ii. **Reiteration of NTEP MDMD Work Group Mission** (J. Truex / D. Flocken)
 - iii. **Goal of this Meeting** (J. Truex / D. Flocken)
- 8:30 AM Status Reports
- iv. **Report – 2014 NCWM Annual Meeting** (J. Truex)
 - v. **Report – Activity of Measurement Canada** (TBD)
 - vi. **Report – Recent NTEP MDMD Type Evaluation Activity** (J. Truex / T. Buck / J. Rae)
- 9:30 AM Break (15 min.)
- 9:45 AM Work session - Carryover Items
- 1. **Review MDMD meeting minutes from 2010 meeting**
- 10:30 AM New Items
- 2. **Review changes to NIST, HB44 MDMD code since last meeting**
 - 3. **Review changes to NCWM, Publication, MDMD Checklist**
 - 4. **Review Measurement Canada code changes**
- 11:45 AM New Items (continued)
- 5. **Review MDMD Requirements Comparison** (J. Truex / D. Flocken)
- 12:00 PM Lunch Break (1 hour)
- 1:00 PM New Items (continued)
- 3:00 PM Break (15 min.)
- 3:15 PM New Items (continued)
- 6. **Review current position / list action items**
- 5:00 PM Adjourn for the day

Wednesday October 29, 2014

- 8:00 AM Continue Work Session – New Items
- 6. **Review current position / list action items - Continued**
- 10:00 AM Break (15 min.)
- 10:15 AM New Items (continued)
- 12:00 PM Lunch Break (1 hour)
- 1:00 PM Closing Discussion
- 7. **Review meeting activities and conclusions**
 - 8. **Define next steps (if needed)**
 - 9. **Next Meeting**
- 3:00 PM Break (15 min.)
- 3:15 PM Work Session
- This time is reserved for revisiting items requiring additional attention and any unscheduled items brought to the Group for consideration.**
- 5:00 PM Adjourn

Note: topic times are approximate and merely included as a rough guideline to aid in maintaining meeting pace; some issues will invariably involve more detailed discussion than others.

CARRYOVER ITEMS

1. Review MDMD meeting minutes from 2010 meeting

No meeting minutes could be found. However, two follow up items were found. They are:

- 1.1 After the meeting Justin Rae did distribute a comparison summary of the requirements in Publication 14 verses those in the Measurement Canada Manual. The review of this document is a later agenda item and will be discussed at that time.
- 2.1 One discussion topic at the meeting was the Measurement Canada Test Objects. Scott Davidson had distributed a copy of the Test Objects specifications. A copy of this document can be found in Appendix A.

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

2011 - Added "Other Devices Designed to Make Multiple Measurement Automatically to Determine Volume" as a title to item A.2.

2013 - Section N.1.4.3. was deleted by adoption of the proposal during the 2012 Annual NCWM Meeting.

N.1.4.3. Test Objects with Protrusions. – If the device is marked with a minimum protrusion dimension to be measured, a test object with protrusion shall be used to verify the marked limitation during type evaluation.

No other changes were found.

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

2011 - Changed the title of Section 8 for "Accuracy" to "Performance" as the Work Group recommended during their 2010 meeting.

2011 - Added statement in Section 10 under "Purpose" clarifying procedures to use for influence factor testing.

No other changes were found.

4. Review changes to Measurement Canada MDMD Terms and Conditions

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5. MDMD and the Mutual Recognition Agreement with Canada

Source: NTEP Administrator

Background /Discussion: The NCWM Board of Directors has directed NTEP to explore the possibility of expanding the scope of the NCWM/Canada Mutual Recognition Agreement (MRA) to include Multiple Dimension Measuring Devices. Measurement Canada (MC) has agreed to engage in discussions towards expanding the scope of the MRA. Key elements of this consideration are to discuss, develop and identify 1) the impact to each country, 2) the pros/cons, and 3) a list of the difference in requirements and procedures between the two countries. Once these tasks are completed expansion of the MRA must be evaluated and agreed upon by MC and the NCWM.

Recommendation: The WG is asked to identify the different checklist requirements and test procedures, US/NTEP vs MC, for MDMDs.

Conclusion: Justin Rae agreed to develop a comparison summary of the requirements in Publication 14 verses those in the Measurement Canada Manual.

Status: On going

NEW ITEMS

6. Review current position / list of action items

Source: NCWM Board of Directors / NTEP Committee

Background /Discussion: The Work Group has been charged with the task of identifying and recommending changes to the current NTEP and Measurement Canada documents in order to permit the additional of MDMD Devices to be included in the Mutual Recommendation Agreement (MRA) on Type Evaluations. This charge is to include:

1. The comparison of specifications and tolerances between Handbook 44 and the Measurement Canada Terms and Conditions and document all differences with the intent of addressing these differences in the evaluation checklist or recommend a change to the specification and/or tolerance one or both documents.
2. The comparison of the current NTEP and Measurement Canada Type Evaluation Checklist to identify differences that may be changed with the intent of harmonizing the two documents. An initial comparison has been made by Justin Rae of Measurement Canada, a copy of this comparison can be found in Appendix B of this agenda.
3. The NCWM Board of Directors and the NTEP Committee, at the suggestion of Measurement Canada, is asking the Work Group to consider recommending the Measurement Canada Evaluation Checklist be the primary document for the evaluation of MDMD Devices.
4. The NCWM Board of Directors and the NTEP Committee, at the suggestion of Measurement Canada, is also asking the Work Group to consider recommending that the Measurement Canada Evaluation Laboratory be identified as the primary laboratory for the evaluation of MDMD Devices.

7. Review meeting activities and conclusions

8. Define next steps (if needed)

9. Next meeting

The Group should maintain a yearly schedule. The NTEP Administrator will determine when the next meeting is possible.

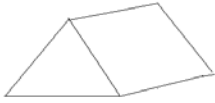
Appendix A:

Dimensional Standards

Materials:

NYLATRON NSM

Dimensions:

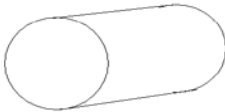


Triangular Prism 1 (L5m-A):

20 cm each side x 60 cm length

Triangular Prism 2 (L5m-B):

40 cm each side x 40 cm length

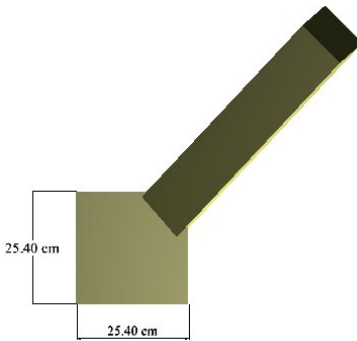


Cylinder 1 (L5m-C):

Ø 15 cm x 60 cm length

Cylinder 2 (L5m-D):

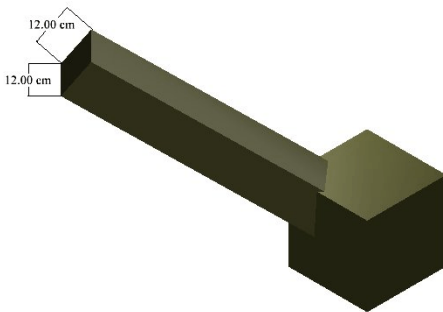
Ø 40 cm x 40 cm length



Irreg 1 (L5m-E):

Cube side = 25.4 cm

Extension = 90 cm total length from the corner of the box to the extremity of the extension (part of which will be inserted inside the cube) x 12 cm x 12 cm



Irreg 2 (L5m-F):

Cube side = 40 cm

Extension = 130 cm total length from the corner of the box to the extremity of the extension (part of which will be inserted in the cube) x 18 cm x 18 cm

Construction:

Fabrication tolerances for each box are as follows:

linear tolerance: ± 0.5 mm (± 0.02 inches)

angular tolerance: ± 0.5 mm (± 0.02 inches)

Thickness of the material: 9.525 mm (3/8 inch) to 12.7 mm (1/2 inch), depending on the design for the construction, #6 and #8 stainless steel woods screws.

The surfaces shall be perfectly parallel and perpendicular to within the above stated tolerances.

Irreg 1 and Irreg 2 must be constructed such that they are completely stable when placed in the position indicated in the drawings above.

Maximum weight of each standard: 15 kg.

All standards to be engraved with their name.

All surfaces shall be smooth, identified with an engraved number and have their nominal dimensions engraved in millimetres.

Appendix B:

MC Requirements			NTEP Requirements		
Markings (Section 1)			Markings (Section 1)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
1.1.1	27.1b	name of manufacturer	1.1	G-S.1	name of manufacturer
1.1.2	27.1c	model number	1.2	G-S.1	model number
1.1.3	27.1d	serial number	1.3	G-S.1	serial number
1.1.4	27.1a	approval number	1.5	G-S.1	approval number
1.1.5	27.1e	min and max dimensions	1.8.1	G-S.1	min and max dimensions
1.1.6	27.1f	interval or "d"	1.8.2	G-S.1	interval or "d"
1.1.7	27.1g	min and max operating speeds	1.8.4	G-S.1	min and max operating speeds
1.1.8		area for verification marks	none		
1.1.9	28	minimum spacing	1.8.6	G-S.1	limitations
	27.1h	temperature range	1.8.3	G-S.1	temperature range
LG-1.01	27.1	Lettering Permanence	1	G-S.1	Lettering Permanence
LG-1.02	27.1	Label/Plate Permanence	1.7	G-S.1	Label/Plate Permanence
1.3	5	Software markings	1.4	G-S.1	Software markings
1.6	28	Special Application	1.8.5	G-S.1	Special Application
1.6	28	Limitations	1.8.6	G-S.1	Limitation of Use
	27.2	Location of Markings	1.6	G-S.1	Location of Markings
		none	1.9	G-S.1	Software Markings Location
1.7	29,30,31	Marking Control, Annunciators	none		
Indication and Display Features (Section 3)			Design of Indicating or Recording Elements (Section 2)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
3.1.1	9a	registrations in decimal format	2.2	S.1.2	registrations must be in a digital format
3.1.2	6a	indications of 1, 2 or 5	2.5.1, 2.5.2	S.1.5	registrations of 1, 2 or 5
3.1.3	6b	binary submultiple	2.5.3	S.1.5	binary submultiples
3.2.1	9a, 15b	reading results is easy, unambiguous	none		
3.2.2	9a, 15b	digits of uniform size, shape and character	2.2	S.1.2	registrations must be in a digital format
3.2.3	15b	no interference with interpretation of measurement	none		
3.2.4	16a	same unit of measurement of all	none		

		axes			
3.2.5	16b	only one unit of measurement may be used			none
3.2.6	16c	L,W,H and units marked and are acceptable			none
3.2.7	15b	separated by decimal point or comma			none
3.2.8		no fixed zeros			none
3.2.9	16b	tare and net in same units			none
3.2.10		rounding followed			none
3.2.11		"L, W, H" indicated			none
3.3.1		Video display - dedicated area for measurement display			none
3.4.1		Volume displayed correctly (units, significant figures, etc)			none
	17	If Volume displayed, dimensions must be provided on demand	2.4	S.1.4	Only volume indicated - test mode for dimensions
		0.3, 0.4 inch division sizes not permitted	2.5.4, 2.5.5	S.1.5	Indirect Sales: 0.3 and 0.4 inch "d"
		no spec for different "d"	2.5.6	S.1.5.2	"d" in x and y different from z
Recorded Representations (Section 4)			Design of Indicating or Recording Elements (Section 2)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
4.1	15c	permanent, legible, same units	2.2	S.1.2	registrations must be in a digital format
4.2	15b	clearly defined			none
4.3	15a	same number of decimal places			none
4.4	16b	unit conversion: proper values			none
4.5	15b	G, N, T, Total Price, Unit Price in agreement			none
Annunciators and Symbols (Section 5)			Design of Indicating or Recording Elements (Section 2)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
5.1	16c	Appropriate figures, words or symbols			none
5.2	15b	Metrological annunciators properly defined			none
5.3	15b	Names, symbols are suitably located			none
5.4	16b	Unit key must automatically change indicated & printed G,N,T units			none
5.5		DIM Weight Defined and Correct			none
Agreement of Registrations (Section 6)			Design of Indicating or Recording Elements (Section 2)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
LG-6.01	15a	Digital values of like value - exact agreement			none
LG-6.02	15b	Suitability of unit conversion			none
Indicating Zero, Negative and Ready (Section 7)			Design of Zero and Tare (Section 4)		

MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
7.1	14(2)	means to indicate zero or ready	2.1, 4.1	S.1.1, S.2	means to indicate zero or ready
7.2	13(1)	not-ready or off zero on both sides of zero			
7.3	14(1)	automatic maintain zero or ready, or inhibit	2.1, 4.1	S.1.1, S.2	inhibit measurements if not ready/zero
7.4		no + or - at zero		none	
7.5	18	display negative when gross < tare	2.3	S.1.3	negative values not displayed unless in tare mode
7.6	18	negative indication cannot be confused		none	
7.7	18	blanking display when under zero		none	
Limits of Indication (Section 8)			Design of Indicating or Recording Elements (Section 2, 11)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
LG-8.01	20a, 32	under minimum (12d)	2.7, 11	S.1.7	under 12 d
LG-8.02	20b, 20c	over maximum (max + 9d)	2.8, 11	S.1.8	over max + 9d
Zero Activate During Measurement (Section 9)			Design of Zero and Tares (Section 4)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
9	13(2)	zero/ready control interlock	4.2	S.2	zero/ready control interlock
Return to Zero (Section 10)			(Section)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
10	13,14	Return to Zero Test	2.1, 4.1		zero/ready condition
Tare (Section 11)			Design of Zero and Tare (Section 4)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
11.1.1	19(1)	Tare operates in backward direction only	4.3	S.2	Tare operates in backward direction onl
11.1.2	15b	Entry of zero tare		none	
11.1.3	19(3)	d tare = d	4.4	S.2	d tare = d
11.1.4	20	Sum of Tare and Net weight < gross load capacity		none	
11.1.5		NET + Tare = GROSS weight		none	
11.1.6	16b	Tare - selecting units of measurement - accuracy and rounding.		none	
11.1.7		Automatic clearing of tares		none	
11.1.8		Tare non-additive		none	
11.1.9	19(2)	Visual confirmation of Tare entry	4.5	S.2	clear indication Tare has been taken
LG-11.01		Tare Test		none	
11.2.1		tare entry only at gross load zero		none	
11.2.2		Tare may be retained between transactions		none	

11.3.1		tare cancellation if there are means to indicate tare value	none		
11.3.2		Tare may be retained between transactions	none		
Segment Verification (Section 12)			(Section)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
12	11	Segment Verification Test	none		
Multiple Measuring Elements (Section 13)			Multiple Measuring Elements (Section)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
13.1.1	10b	Prohibit activation of measuring elements not in use	5.1	S.3	Prohibit activation of measuring elements not in use
13.1.2.	10a	Indicating which measuring element is used	5.2	S.3	Indicating which measuring element is used
13.1.3		Weighing elements are identified	none		
13.1.4	10a	Recording which weighing element is used	none		
13.1.5		Performing a function on a particular weighing element does not affect other elements	none		
13.1.6	14	Zero or ready must remain active	none		
	9b	Portable indicator			
Multiple Interval (Section 14)			(Section)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
14.1.1	7a	$d1 < d2 < d3$	none		
14.1.2		Gross = Net + Tare	none		
14.1.3		Gross = Net + Tare: exact agreement	none		
14.1.4		Tare: Rounding rules	none		
14.1.5	33	Tolerance function of range	none		
14.1.6	33	Keyboard or Platter Tare: meets tolerance for net loads	none		
	7b, c, d	Capacity of ranges	none		
Direct Sale (Section 15)			(Section)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
15	22, 31	Information as required by Spec 22	none		
Non-Metrological Functions (Section 16)			(Section)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
16	29	Non-metrological functions do not cause errors, perpetration of fraud	none		
Software Version Test (Section 17)			Markings (Section 1)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description
17	5	Software Identification test	1.4	G-S.1	Software markings
Performance Tests (Part 3)			Performance (Sections 7, 8, 9, 10)		
MC Manual	MC Spec	Description	Pub. 14	Handbook 44	Description

3.01	36	Short Time Power Reduction (not performed)	none		
3.02	35a,b	Power Voltage	9	T.5.2	Power Voltage
3.03	36	Electrical Burst Test (not performed)	none		
3.04	36	Electrostatic Discharge (not performed)	none		
3.05	36	EM Susceptibility (not performed)	none		
3.06	3, 33	Warm Up	7	S.1.9	Warm Up
3.07	3, 33	Conveyor Belt Seam	none		
3.08	3, 33	Measurement Speed Test	none		
3.09	7,8	Interval of "d"			
3.10	26,33, 35c	Temperature range	10	T.5.1	Influence Factor
3.11	35d	Damp Heat (not performed)	none		
3.12	3, 33	Eccentricity	none		
3.13	3, 33	Drag Test	none		
3.14	33	Repeatability	8		Accuracy
3.15	3, 33	Minimum Spacing	none		
3.15.5	3, 33	Touching	none		
3.16	3, 33	Variable Orientation	none		
3.17	3, 33	Variable Object Shape	none		
3.18	3, 33	Variable Surface (only for palletized)	none		
3.19	3, 33	Protrusions (not performed)	none		
3.20	3, 33	Sensor/Emitter Obstruction	none		
3.21	35e	Radiated Light (not performed)	none		
3.22	35f	Acoustic Interference (not performed)	none		

Notes:

1) Table S.1.6 (Handbook 44) and Spec. 21, 22 (MC) contain marking requirements that are not always part of an approval evaluation, as this info is sometime instead to be provided by the billing system used in conjunction with the device.

2) Sealing requirements were not included in this comparison