4 STRUCTURE OF TESTS

Unless otherwise specified, each procedure will consist of 3 repeats at each of 5 dimensions that are representative of the measuring range(s) of the device under test.

Tests of influence factors will be performed at a reference condition and then near the extremes of the influence factors, unless otherwise specified.

1.0 MARKING Already exist in Pub 14

2.0 SEALING Already exist in Pub 14

3.0 INDICATION AND REGISTRATION – REPRESENTATION Already exist in Pub 14

4.0 RECORDED REPRESENTATION (PRINTED)

4.1 All recorded values shall be permanent, legible, and printed in digital format. The device must indicate and print measurement values in the same unit of measurement.

4.2 All measurement values shall be clearly defined using acceptable words, abbreviations or symbols.

4.3 A printer must record the same value and number of decimal places as that shown by the indicator.

4.4 If the unit of measurement of the device can be externally selected by the user, the printer must record the proper units with the measurement values.

4.5 Computation is in mathematical agreement (for example, gross length - tare length = net length; unit price x unit = total price, rounded off to the nearest division).

5.0 VALUES DEFINED

Graduations, indications, and recorded values that are intended to have specific values as well as metrological significant annunciators must be adequately identified by suitable words, abbreviations or symbols. These defining terms must be placed relative to graduations, indications, recorded values or annunciators and as close as practical to them without interfering with their readability.

5.1 Measurement indications must be properly defined by appropriate figures, words or symbols (cm, in, litres, ft^3, etc).

5.2 Annunciators that are metrologically significant are defined with appropriate words or symbols.

5.3 The names, abbreviations and symbols are suitably located.

5.4 If the device has an external key or switch (user key) to change the measurement unit (cm/in), the printer must automatically print the appropriate unit of measurement.

Acceptable Methods of Displaying or Registering Dimensional Weight

5.5 When dimensional weight is being displayed or printed, it must be done in a manner that is clear and does not mislead a consumer into thinking that the value displayed is a true weight value. To emphasize this difference, in cases where a unit of measure is used, the unit symbol must be immediately preceded by the word dimensional or DIM. Since these are not true unit symbols, the rules for correct symbol usage do not apply so the units could be presented in upper case format, pluralized or some other variation. The use of a unit of measure is not mandatory however and is not recommended.

The following are some examples of how dimensional weight may be presented.

1. DIM = 15;
2. DW = 19;
3. DIM WT = 6;
4. Dimensional weight = 29 DIM KG;
5. Dim Weight = 3 DIM lb;
6. DIM WT = 4 DIM kgs;
7. DIM = 7.8 DIM LB;

6.0 AGREEMENT OF REGISTRATIONS

Test procedure:

A Ensure that the DUT is at a zero or ready condition.

B While the DUT is in the unloaded, ready condition, observe, record and print all of the registrations that the DUT is designed to produce.

C Place a small standard or test object in/on the measurement area.

D Observe, record and print all of the registrations produced.

E Measure other standards or test objects at or near the capacity of the DUT.

F Observe, record and print all of the registrations produced for each standard.

G Repeat steps A to F for each unit of measurement in which the device can display.

Unit Conversion Test

Test procedure:

A Ensure that the DUT is at a zero or ready condition.

B Select standards or test objects that will produce measurements in each interval range on each axis that the DUT is capable of displaying.

C Measure each of the selected objects on the DUT.

D Observe, record and print all of the registrations produced as a result of the measurements.

E Change the unit of measurement.

F Repeat steps A to D for each unit of measurement on the DUT.

G Compare the results of the test measurements.

7.0 INDICATING ZERO AND NEGATIVE VALUES

Indicating zero

7.1 The device must be provided with means to adequately indicate or record a zero or ready condition. ***A ready condition may be previous measurement.***

7.2 A not ready condition or off zero function must operate on both sides of zero.

7.3 A device must either automatically maintain a zero or ready condition or inhibit the device from providing any useable measurement registrations.

7.4 On digital indicating devices, a + or - sign must not appear when the device is indicating zero in any of the available units.

Displaying negative values

7.5 A display of negative value is required in the NET display mode when the GROSS measurement is less than the TARE value.

7.6 A negative value must be indicated in a manner that cannot be confused with a positive measurement value. A minus sign clearly associated with the measurement indication may be used provided that it is located in a manner that does not interfere with the measurement.

7.7 Blanking the display is a method that may also be used to indicate an under-zero condition when the device is in the GROSS mode (no tare); the device may also display symbols which cannot be interpreted as a quantity value (e.g. EEEEEE, UNDER, S-1, etc.). A row of zeros, flashing zeros or flashing measurement values are not acceptable means.

8.0 LIMITS OF INDICATION Already exist in Pub 14

9 ZERO MAINTENANCE INTERLOCK TEST

A. Ensure that the DUT is in a zero/ready condition.

B. Present a standard or test object to the DUT, with a long axis in the **horizontal** orientation.

C. Observe the display and print or record the measurement registrations produced.

D. Ensure that the DUT is in a zero/ready condition.

E. Present the same standard or test object a second time to the DUT in the same orientation as in step B.

F. While the standard is being measured, activate or adjust the zeroing mechanism.

G. Observe the display and print or record the measurement registrations.

H. Repeat steps B and C.

10 RETURN TO ZERO TEST

Test procedure:

A. Start the DUT.

B. Ensure that the DUT has a stable zero or ready condition before beginning this test.

C. When a zero or ready condition is attained, pass a standard through the measurement opening.

D. Observe and record the measurement registrations for the standard.

E. Ensure that display returns to a zero or ready condition. Record the information that is displayed.

F. Repeat steps C, D and E, 2 more times.

11.0 TARE Already exist in Pub 14

12 SEGMENT VERIFICATION (For LED or Dot Matrix Displays Only)

Test procedure:

A. Determine from the information provided by the manufacturer, the procedure for doing the segment verification test.

B. Perform the procedure.

C. Observe and record the results.

13.0 MULTIPLE MEASURING ELEMENT SYSTEMS

An indicator and/or printer may be connected to more than one measuring element provided that the measuring system is designed to ensure accuracy of the transactions, and to prevent erroneous measurements or fraud.

Two basic system configurations are:

1) a system where only one measuring element can be selected and used at a time; and

2) a system where all of the measuring elements can operate simultaneously. Or the measuring elements are connected to a specially designed indicator that can display simultaneous or alternating measurement values from the individual measuring elements.

13.1 For both of these systems;

Each separate measuring element and the indicating element is considered a separate device and must be tested accordingly. In addition to other applicable requirements:

13.1.1 The system must have the means to inhibit the use of any measuring element that is not in use.

13.1.2 The indicating element must automatically provide a clear and continuous indication of which measuring element is in use. The indication must be visible from the operator's normal position.

13.1.3 Measuring elements must be clearly and permanently identified with the corresponding identification.

13.1.4 The printer must provide on the ticket, for each measurement, a clear registration indicating which measuring element was used.

13.1.5 When an operator-activated function (entering a tare value, selecting or clearing a function, etc...) is performed on one particular measuring element, functions or parameters of other measuring elements must not be affected or altered.

13.1.6 The zero or ready condition functions for all measuring elements must remain active regardless of which measuring element is being used.

Test procedure:

A. Zero each individual measuring element

B. Present different standards or measured test objects to each of the measuring elements simultaneously.

C. Study the results to ensure that measurements were made correctly for each test object.

D. Enter a tare value for one measuring element.

E. Repeat steps B and C.

F. Inhibit one of the measuring elements as per the manufacturer's directions.

G. Attempt to measure an object on the inhibited device.

H. Observe and record the results.

I. Repeat steps F, G and H for each of the remaining measuring elements.

14 MULTI-INTERVAL DEVICES

For any test performed on a multi-interval device, the tolerance is a function of the interval **d** of the range corresponding to the test load used.

15 DEVICES USED FOR DIRECT SALE TO THE PUBLIC

16 NON METROLOGICAL FUNCTIONS

A device may perform functions, other than metrological, such as accounting functions provided that those non metrological functions do not alter the metrological characteristics or functions of the device, do not cause measurement errors nor facilitate the perpetration of fraud.

17 SOFTWARE IDENTIFICATION TEST Not an NTEP requirement

1 SHORT TIME POWER REDUCTION TESTS NOT an NTEP Requirement

2 POWER VOLTAGE TESTS - Already exist in Pub14

3 ELECTRICAL BURST TEST Not an NTEP Requirement

4 ELECTROSTATIC DISCHARGE TEST Not an NTEP Requirement

5 ELECTROMAGNETIC SUSCEPTIBILITY TEST Not an NTEP Requirement

6 WARM UP TEST Already exist in Pub14

7 CONVEYOR BELT SEAM TEST

Test procedure:

A Set the conveyor belt to its **fastest speed**. Record this value.

B Ensure that the DUT is at a zero or ready condition.

C Place the smallest standard, in a **horizontal orientation**, on the conveyor belt seam, and pass it through the measurement area. The standard should pass through the DUT near the midway point of the measurement opening.

D Observe the displayed registrations and print or record the results.

E One at a time, place the remaining standards in increasing size, on the seam, and pass them through the measurement area. Ensure that the standards are all in the same horizontal orientation and pass through the DUT near the centre of opening as in step C.

F Observe, print and record all of the registrations.

G Adjust the conveyor belt speed to its **middle speed**. Record this value.

H Ensure that the DUT is in the ready condition.

I Arrange the standards in the **transverse orientation** for presentation to the DUT. Pass them through the measurement opening, positioned on the seam, in the same increasing size order and through the midpoint of the measurement opening.

J Observe, print and record all of the registrations.

K Adjust the conveyor belt speed to its **slowest speed**. Record this value.

L Ensure that the DUT is in the ready condition.

M Arrange the standards in the **vertical orientation** for presentation to the DUT. Pass them through the measurement opening, positioned on a seam, in the same increasing size order and through the midpoint of the opening. Watch for any wobbling in the standards that is not attributable to the conveyor belt seam.

N Observe, print and record all of the registrations.

8 MEASUREMENT SPEED TEST For Devices with Variable Speeds

Test procedure:

A Determine from the documentation provided by the approval applicant the steps necessary to set the device to a specified speed of measurement.

B For a device equipped with a conveyor, position the test tachometer over one of the pulleys so that the sensing wheel is driven by the conveyor belt.

C Activate the device and let the equipment run until a stable speed is achieved.

D Adjust the measurement speed to the **fast** setting. For a device equipped with a conveyor, this can be achieved using the test tachometer as a reference. Let the equipment run at the correct speed and fine tune the adjustment if necessary. Confirm that the correct, stable speed has been maintained for one minute.

E For a device equipped with a conveyor, record the test tachometer speed indication. For other devices, use a stopwatch to establish the time required for one complete measurement cycle.

F Observe the speed being indicated by the DUT. Record this value.

G Ensure that the DUT is at a zero or ready condition.

H Place the smallest standard, in the horizontal orientation, in/on the measurement area. The standard should be near the center of the measurement area.

I Observe the displayed registrations and print or record the results.

J Repeat steps F to I for each of the remaining standards including the standards in combination as needed.

K If the standards were not large enough to reach the DUT capacities then place a box or package, having been measured with a linear standard that is close to the capacities for each axis, in/on the DUT.

L Repeat steps D to K at the **slow** speed setting.

9 INTERVAL TEST

Test procedure:

A Determine the specified interval values for each axis, including dual units if applicable, and for each range if the DUT has multi-interval capabilities.

B Ensure that the DUT is at a zero or ready condition.

C Select a standard or test object that is appropriate for the lower measuring portion of the axis that is under test.

D Place the standard or test object in/on the measurement area.

E Observe the displayed registrations and print or record the results.

F Increase the dimension of the standard or test object by an amount equal to the interval size of the axes being tested.

G Confirm this adjustment with a depth gauge and record the value.

H Ensure that the DUT is in the ready condition.

I Place the adjusted standard or test object, in the same orientation and in the same axis as in step C, in/on the DUT.

J Observe, print and record all of the registrations and note any other observations or results.

K Repeat steps C to J with a larger standard for confirmation of the interval in the higher measuring portion of the axis under test.

L Repeat steps B to K for each axis, for each unit of measure and for each interval range, as necessary, that the DUT is capable of.

M For multi-interval devices, select test objects that are suitable for testing the transition points of each range and repeat steps D to J for each of the transition points on the DUT.

10 TEMPERATURE RANGE & TEMPERATURE EFFECT ON ZERO TEST Already exist in Pub14

11 DAMP HEAT TEST Not an NTEP Requirement

12 ECCENTRICITY TEST

A Ensure that the DUT is at zero or in the ready condition.

B Place the standards, in increasing sizes from the smallest to the largest in the transverse orientation, in/on the measurement area near the center of the area. Print the measurements made by the DUT.

C Ensure that the DUT is in the ready condition and place the standards, in the same order and in the same orientation as in step B, but shifted to one side of the measurement area. The consecutive standards will be widening toward the center of the measurement area. Print the measurements made by the DUT.

D Ensure that the DUT is in the ready condition and place the standards, in the same order and in the same orientation as in step B, but shifted this time to the other side of the measurement area. The standards in this instance will again be widening toward the center of the measurement area, but this time in the opposite direction of the previous sequence. Print the measurements made by the DUT.

13 DRAG TEST (If Conveyor has Guide Rails or other Structural Elements)

Do not use test standards for this procedure.

Test procedure:

A Select and measure 5 test objects or boxes (one of them should be a heavy package) and pass them (horizontal orientation) one after another through the centre of the measurement area.

B Observe the display and record and print the registrations of length, width, height and volume.

C Repeat steps A and B but this time place the test objects against the left most rail or side of the conveyor system such that the test objects will drag against the rail as they go through the measurement process.

D Observe the display and record and print the registrations.

E Repeat steps A and B but this time place the boxes against the right most rail of the conveyor system such that they will drag against the rail as they go through the measurement process.

F Observe the display and record and print the registrations.

G Repeat steps A to F at the **maximum** belt speed and then again at the **minimum** belt speed.

14 REPEATABILITY TEST

Test procedure:

A Set the measurement speed to its maximum setting.

B Ensure that the DUT is at zero or in the ready condition.

C Select a standard or test object near the minimum capacity of the DUT and place it near the centre of the measurement area. The test standard should be positioned with its largest area side down to maximize its stability.

D Record or print the registrations.

E Repeat steps B, C and D 9 more times and ensure that the standard or test object is presented to the DUT in the same manner as it was in step C each time.

F Repeat steps B to E with a test object near 50 % of the capacity of the DUT.

G Repeat steps B to E with a test object near 100 % of the capacity of the DUT.

H If the DUT is a multi-interval device, ensure that each interval range is tested.

I For each individual set of data for the registrations determine the delta value by subtracting the minimum registration obtained from the maximum registration obtained. Record each delta value. The DUT is repeatable if, during the test, the delta value for each set of data is not greater than the absolute value of the limit of error.

15 MINIMUM SPACING TEST

Test procedure:

A If applicable, determine the measurement and/or conveyor belt speed. Record this value.

B Ensure that the DUT is at a zero or ready condition.

C Place a standard on/in the measuring element.

D Observe the displayed registrations and print or record the results.

E Place a second, different standard in/on the measuring element as in step C. Observe, print and record all of the results.

F Ensure that the DUT is in the ready condition.

G From the information provided by the manufacturer, determine the minimum spacing between objects that the DUT is designed for. Record this value.

H Arrange the same two standards in the same order and orientation for presentation to the DUT as previously. Present them to the DUT in such a way that they offend the minimum spacing value determined in step G.

I Observe, print or record all of the registrations and note any other observations or results.

J Ensure that the DUT is at a zero or ready condition.

K Using the same standards, repeat steps B to E, but this time with the first standard toward the right side of the measurement opening and the second standard toward the left side of the opening.

L Using the same standards, repeat steps F to H, but this time with both standards, in the same orientation and positions as previously, presented to the DUT at the same time. The test objects do not have to be exactly in line or parallel to each other as long as they are at least overlapped.

M Observe, print or record all of the registrations and note any other observations or results.

N Ensure that the DUT is in the ready condition.

O If applicable, determine the positioning of two standards that would create a shadowing situation for the DUT sensors. Note this information.

P Ensure that the DUT is at a zero or ready condition.

Q Present the standards, individually, to the DUT in the positions determined in step O.

R Observe, print or record all of the registrations and note any other observations or results.

S Present the standards, together this time, so that the shadowing situation determined in step O, is seen by the DUT.

T Observe, print or record all of the registrations and note any other observations or results.

16 VARIABLE ORIENTATION TEST

Test procedure:

A Ensure that the DUT is at zero or in the ready condition.

B Select a standard and place it near the centre of the measurement area in the horizontal position (0º) with the y axis in the vertical orientation.

C Record or print the measurement registrations.

D Repeat steps B and C for the same standard but rotated to the left with each of the following variations from the horizontal axis; 45º, 90º, 135º.

E Turn the standard onto its side so that the x axis is now in the vertical orientation and continue presenting the standard at 180º, 225º, 270º and 315º. Observe the indications, record and print the values obtained.

F Stand the standard on its end and rotated to 45º and present it to the DUT.

G Observe, record and print the results.

17 VARIABLE_OBJECT_SHAPE_TEST (Known Shapes)

Test procedure:

A Ensure that the DUT is at zero or in a ready condition.

B Present each of the irregularly shaped standards to the DUT for measurement.

C Observe the responses of the DUT and record the results.

D Print and download the information to confirm that the registrations are correct and in agreement.

E Repeat steps A to D, 2 more times.

18 VARIABLE_SURFACE_TEST Not an NTEP Requirement

NOTE: This test is not currently performed by Measurement Canada.

19 PROTRUSION_TEST

NOTE: This test is not currently performed by Measurement Canada.

A Determine from the information provided by the approval applicant, how the system has been designed to deal with protrusions. List all of the parameters such as size limitations and restrictions that will have a bearing on the performance of the device.

B Select a standard appropriate for the interval size of the measurement range being tested and place it in/on the center of the measurement area in the horizontal orientation.

C Observe the registrations and record the results.

D Select 5 of the protrusion pieces that are smaller than the parameters specified for the DUT and attach them to the standard used for the reference run in step B. Record the dimensions or identification numbers of the protrusions used.

E Send the same standard again, with the protrusions attached, through the DUT as in step B.

F Observe the response of the device, its registrations and record the results.

G Replace the smallest protrusion piece with one that is larger than the size restriction listed for the DUT. Record the size information for this piece.

H Test each of the three axes with this protrusion and record the results.

I Study the results of these 3 measurements and determine if the device responded appropriately. Also note if any of the previously unmeasured protrusions are now being measured as a result of the addition of the larger protrusion.

J Measure the standard again but this time in the diagonal orientation.

K Observe the response of the device, its registrations and record the results.

L If the device is multi-interval repeat steps B through H with appropriately sized standard and protrusions.

20 SENSOR/EMITTER OBSTRUCTION TEST How is dust or condensation simulated?

Not an appropriate test.

21 RADIATED_LIGHT_TEST Not an NTEP Requirement

NOTE: This test is not currently performed by Measurement Canada.

22 ACOUSTIC INTERFERENCE TEST Not an NTEP Requirement

NOTE: This test is not presently being performed by the laboratory. This test will be performed once the facilities necessary for this test have been acquired.