13/1/7
18 December 2013

Australian Government
National Measurement Institute

Bradfield Road, West Lindfield NSW 2070

Cancellation

Certificate of Approval No 13/1/7

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that the approval for use for trade granted in respect of the

Mettler Toledo Model Cargoscan CS5200.2 Dimensional Measuring Instrument

submitted by Mettler Toledo Limited
220 Turner Street
Port Melbourne VIC 3207

has been cancelled in respect of new instruments as from 1 February 2014.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.

Dr A Rawlinson

Australian Government
National Measurement Institute

Bradfield Road, West Lindfield NSW 2070

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Issued by the Chief Metrologist under Regulation 60
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This is to certify that an approval for use for trade has been granted in respect of the

Mettler Toledo Model Cargoscan CS5200.2 Dimensional Measuring Instrument

submitted by Mettler-Toledo Limited
220 Turner Street
Port Melbourne VIC 3207.

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 129, *Multi-dimensional Measuring Instruments*, dated July 2004.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 July 2013, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 13/1/7' and only by persons authorised by the submittor.

It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

…./2

The National Measurement Institute reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate s No S1/0/A or No S1/0B.

Special:

Instruments are only approved for use for determination of the dimensions and volume of the smallest rectangular box that could contain an object, for the purposes of determining freight or postal charges.

The dimensions determined may also be used for the calculation (by peripheral equipment) of a volume and/or 'dimensional weight' (*) value of the object, also for the purposes of determining freight or postal charges.

(*) A 'dimensional weight' value is a calculated value deemed to be a weight value obtained by applying a conversion factor to the object's volume.

DESCRIPTIVE ADVICE

Pattern: provisionally approved 14 March 2003
approved 27 June 2003

- A Mettler Toledo model Cargoscan CS5200.2 dimensional measuring instrument.

Technical Schedule No 13/1/7 describes the pattern.

Variant: approved 24 July 2007

1. With increased maximum belt speed up to 120 m/min.

Technical Schedule No 13/1/7 Variation No 1 describes variant 1.

Variant: approved 22 September 2011

2. With increased maximum belt speed up to 160 m/min.

Technical Schedule No 13/1/7 Variation No 2 describes variant 2.

FILING ADVICE

Certificate of Approval No 13/1/7 dated 21 April 2009 is superseded by this Certificate, and may be destroyed. The documentation for this approval now comprises:

Certificate of Approval No 13/1/7 dated 22 September 2011
Technical Schedule No 13/1/7 dated 13 October 2003 (incl. Test Procedure)
Technical Schedule No 13/1/7 Variation No 1 dated 21 April 2009 (incl. Note)
Technical Schedule No 13/1/7 Variation No 2 dated 22 September 2011 (incl. Notification of Change)
Figure 1 dated 13 October 2003

Signed by a person authorised by the Chief Metrologist to exercise his powers under Regulation 60 of the *National Measurement Regulations 1999*.

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TECHNICAL SCHEDULE No 13/1/7

Pattern: Mettler Toledo Model Cargoscan CS5200.2 Dimensional Measuring Instrument

Submittor: Mettler Toledo Limited
220 Turner Street
Port Melbourne VIC 3207

1. Description of Pattern

A Mettler Toledo model Cargoscan CS5200.2 dimensional measuring instrument which is approved for use for the determination of the dimensions of the smallest rectangular box that could contain an object, for the purposes of determining freight or postal charges. The instrument carries out this measurement whilst the object is in motion.

The instrument has output sockets for the connection of auxiliary and/or peripheral equipment.

1.1 Details

The pattern is approved for use for the determination of the linear dimensions of the smallest rectangular box that could contain an object having maximum dimensions (i.e. length x width x height) of 250 x 120 x 92 cm and minimum dimensions of 5 x 5 x 5 cm, with a scale interval (d) of 5 mm with a belt speed (Vmax) of up to 75 m/min.

Note: There are limitations on the surfaces of the objects being measured and their placement which must be complied with to ensure accurate measurement. These limitations are included in the instrument manuals.

Instruments may measure either cuboidal (#) or non-cuboidal objects, depending on the software version (see cl. **1.2 Software Versions**).

(#) A cuboidal object (also known as a rectangular parallelepiped or rectangular box-shaped object) is a polyhedron having six faces that are parallel in pairs; each face is a parallelogram and adjacent edges are perpendicular.

1.2 Software Versions

There are three modes of operation achieved by different versions of software as defined below (see the instrument manuals regarding details of the acceptable arrangement of objects in each case):

(i) “Standard software” (CS)

- Objects need not be cuboidal.
- Objects can be placed side by side, but there is a minimum spacing requirement of 2.5 cm.

(ii) “Touching software” (TC)

- To be used for cuboidal objects only.
- Objects may be touching and will in that case be split into separate rectangular objects.

..../2

(iii) "Cuboidal software" (HS)

- To be used for cuboidal objects only.
- To be used for non-touching objects only.

Instruments shall carry a notice that clearly indicates the particular software version and mode of operation.

1.3 Dimensioning Unit

The pattern includes a Cargoscan model CS5200.2 dimensioning unit mounted on a supporting frame above a belt-conveyor type load receptor (Figure 1). Within this dimensioning unit there are two dimensioning heads each consisting of a laser diode based range finder that scans the object (forming a 'light curtain') via an optical scanning mechanism consisting of a rotating polygon with 6 mirrors and mirror arrangement including a curved mirror. The laser range finders determine data regarding the profile of the object as it passes beneath the dimensioning unit.

Data from the laser range finders and from the pulse generator (see cl. **1.4 Pulse Generator**) is analysed by the CPUs to determine the linear dimensions of the smallest rectangular box that would fully contain the object.

1.4 Pulse Generator

A Leine & Linde model 54004621-2500 pulse generator provides information regarding the belt speed which is used in the data analysis by the CPU to determine object length.

1.5 Indicator/Control Panel

The Cargoscan model CS2200 indicator/control panel (Figure 1) shows the length, width and height in cm. This indicator/control panel also displays a volume in dm^3 of each object being measured.

Note: For charging purposes, calculations involving volume should use volume calculated from the length x width x height rather than the displayed volume (for small objects the rounding of the displayed volume may result in excessive relative errors).

The instrument has a number of alarm functions which display error messages if the object is too big, too small, outside the measurement field, too reflective, etc. An explanation of alarm functions and error messages is given in the instrument manual.

1.6 Peripheral Calculation, Storage or Printing Devices

As indicated in the Special Conditions of Approval, this approval includes the possibility of peripheral equipment being used to calculate, store or print a 'dimensional weight' and/or a postal or freight charge, in addition to the linear dimensions and volume.

Although this approval does not describe specific peripheral equipment, various equipment may be used provided that at verification/certification it will be necessary for the correct operation of this peripheral equipment to be determined, as follows:

(i) Calculation of volume (see note under cl. **1.5 Indicator/Control Panel**):

The volume shall be shown in m^3 with at least five digits after the decimal place rounded to the nearest digit (e.g. 5.5 cm x 5.0 cm x 5.5 cm = 0.000 151 25 m^3 – this would round to 0.000 151 2 m^3, 0.000 151 m^3 or 0.000 15 m^3).

Alternatively the volume may be shown in dm^3 with at least two digits after the decimal place, rounded to the nearest digit (e.g. 5.5 cm x 5.0 cm x 5.5 cm = 0.151 25 dm^3 – this would round to 0.151 2 dm^3, 0.151 dm^3 or 0.15 dm^3).

(ii) Calculation of 'dimensional weight' where necessary.

'Dimensional weight' = Conversion factor x Volume

Note: the conversion factor shall be displayed or printed by the peripheral equipment.

The 'dimensional weight' value shall be shown with an appropriate number of significant digits. This can be determined by calculating 10% of the minimum dimensional weight (i.e. 10% of minimum volume multiplied by the conversion factor) – the 'dimensional weight' value should not be rounded to less than the resulting value.

For example the minimum volume is 5.0 cm x 5.0 cm x 5.0 cm = 0.000 125 m^3, if the conversion factor is 167 kg/m^3 the minimum 'dimensional weight' will be 0.020875 kg, 10% of this is 0.0020875 kg. The 'dimensional weight' value should be rounded to three digits (the nearest 0.001 kg), but should not be rounded to two digits.

1.7 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

1.8 Sealing Provision

Provision is made for sealing the calibration adjustments in the indicator/control panel by means of an electronic sealing feature which is password protected. A four digit event counter records every time the electronic seal is opened; the counter resets to '1' when it passes 9999 counts. By noting the value of the event counter at the time of verification/certification it is possible to verify if the seal has been opened since the previous verification/certification.

1.9 Descriptive Markings

Instruments carry the following markings:

Manufacturer's mark, or name written in full	.....
Name or mark of manufacturer's agent	.....
Model designation	.....
Serial number of the instrument	.....
Year of manufacture	.....
Pattern approval mark	NSC No 13/1/7
Maximum dimensions for each axis	Max ..... cm
Minimum dimensions for each axis	Min ..... cm
Scale interval	d = ... cm
Maximum belt speed	..... m/min
Minimum belt speed	..... m/min

1.10 Notices

Instruments shall carry appropriate notices regarding restrictions on use. For example:

- Place object with most stable surface down.
- For rectangular-box shaped objects only (if appropriate - see cl. **1.2 Software Versions**).
- Non-touching objects only (if appropriate - see cl. **1.2 Software Versions**).

TEST PROCEDURE

The maximum permissible error at verification/certification expressed in terms of scale interval (d) is:

±1.0d for lengths from the minimum length to any value up to and including the maximum length capacity of the instrument.

1. Test objects shall be used, in the shape of rectangular boxes with known linear dimensions such that each axis (i.e. length x width x height) is tested for at least five dimensions between and including the minimum and maximum dimensions (approximately) specified on the instrument nameplate. Each test object shall be opaque, rigid and with flat faces and well-defined edges. All adjacent faces and edges shall be perpendicular to each other. The dimensions shall be equal to Nd and known to an uncertainty equal to or better than ±1/3d using a verified length standard. N is a whole number.
2. Vary the position across the receptor, and the orientation of the test objects so that each axis is tested for the five dimensions.
3. Tests shall be conducted at both the minimum and maximum conveyor speeds, as marked on the instrument nameplate.

4. Check that the dimensions indicated are within the maximum permissible error, i.e. the display is either Nd or (N±1)d.
5. Check that content and format of any printed information (from the instrument or peripheral equipment) is acceptable. The printed information shall include the date and transaction number or other identification of the object, and:
   - At least the three measured dimensions with units (e.g. 23.0 × 13.5 × 51.5 cm would be acceptable).
   - Other pertinent information (e.g. price rate and price).
   - A note that “Dimensions/Volume shown are those of the smallest rectangular box that fully encloses the object”.

     The following abbreviations may be used in the presentation of this information:

     Length (L), width (W), height (H), and volume (vol)
   - Where ‘dimensional weight’ is printed, a note that “The dimensional weight is a calculated value deemed to be a weight value obtained by applying a conversion factor to the object’s volume or dimensions”.

     The following abbreviations may be used in the presentation of this information:

     Length (L), width (W), height (H), volume (vol) and dimensional weight (Dim Wt or DW).
   - The calculated volume (if used), rounded according to cl. **1.6 Peripheral Calculation**. The applicable units (e.g. dm^3) shall also be printed.
6. Check that when the information is displayed (e.g. on computer equipment) rather than printed, the information required and format shall be similar to that required above for printing.

NOTE: Instruments shall only be used as specified in the Special Condition of Approval.

TECHNICAL SCHEDULE No 13/1/7

VARIATION No 1

Pattern: Mettler Toledo Model Cargoscan CS5200.2 Dimensional Measuring Instrument

Submittor: Mettler Toledo Limited
220 Turner Street
Port Melbourne VIC 3207

1. Description of Variant 1

A Mettler Toledo model Cargoscan CS5200.2 dimensional measuring instrument which is the same as the pattern but is now approved for use for the determination of the linear dimensions of the smallest rectangular box that could contain an object having maximum dimensions (i.e. length × width × height) of 200 × 120 × 92 cm and minimum dimensions of 8 × 8 × 8 cm, with a scale interval (*d*) of 10 mm with a belt speed (V_{max}) of up to 120 m/min.

NOTE: The date at which this approval becomes due for review has been amended following completion of a review.

TECHNICAL SCHEDULE No 13/1/7

VARIATION No 2

Pattern: Mettler Toledo Model Cargoscan CS5200.2 Dimensional Measuring Instrument

Submittor: Mettler-Toledo Limited
220 Turner Street
Port Melbourne VIC 3207

1. Description of Variant 2

A Mettler Toledo model Cargoscan CS5200.2 dimensional measuring instrument which is the similar to the pattern but now uses a version of software known as 'High Speed software' (HS) with capabilities as defined below:

- To be used for cuboidal objects only;
- To be used for non-touching objects only; and
- Instruments are fitted with a SICK model WL 12L-2B520 photo eye sensor.

Using this software the instrument is approved to measure the linear dimensions of cuboidal objects having maximum dimensions (i.e. length × width × height) of 250 × 120 × 92 cm and minimum dimensions of 8 × 8 × 8 cm, with a scale interval (*d*) of 5 mm with a belt speed (Vmax) of up to 160 m/min.

NOTIFICATION OF CHANGE

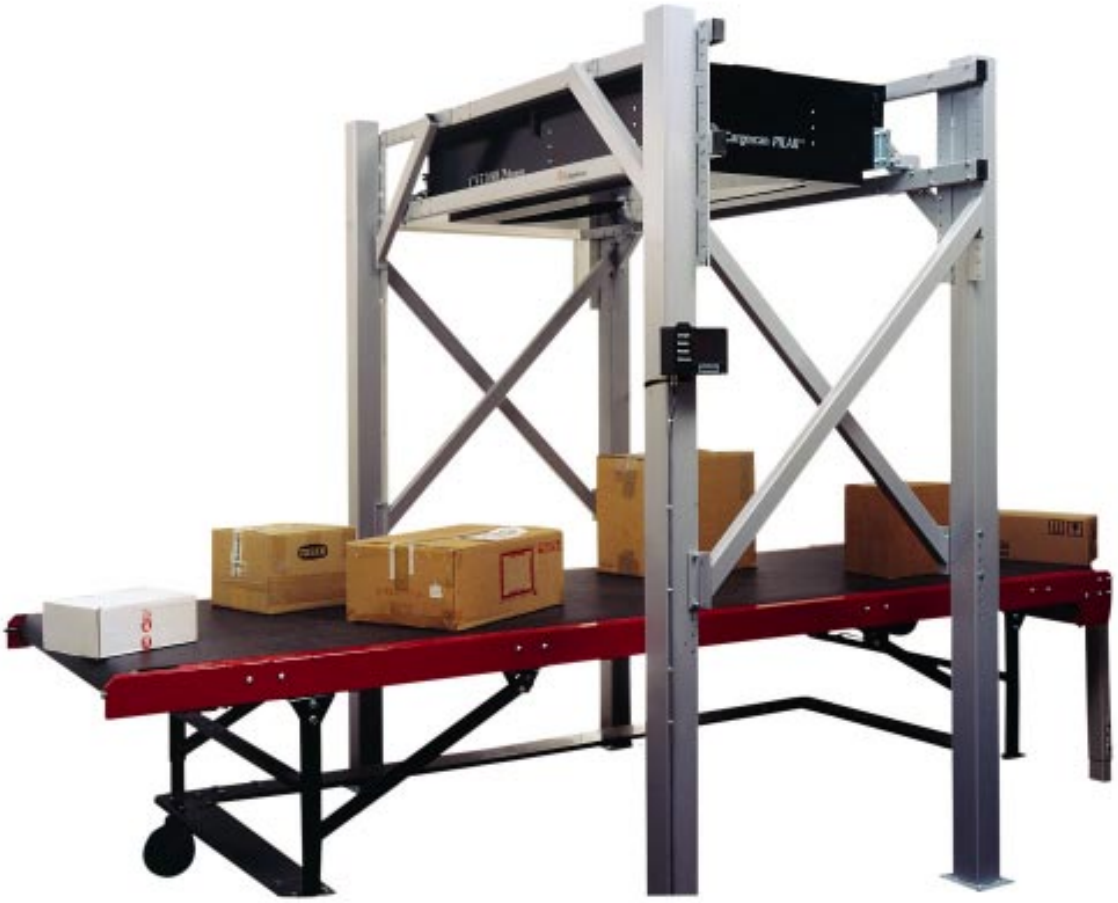
A. In Technical Schedule No 13/1/7 dated 13 October 2003, test 1. in the TEST PROCEDURE is amended by changing the value of the uncertainty (of the test objects) to read:

"… equal to or better than ±**0.2** d using a …"

B. In Technical Schedule No 13/1/7 Variation No 1 dated 21 April 2009, clause **1. Description of Variant 1** is amended by changing the reference to the minimum dimensions to read:

" of **10** × **10** × **10** cm, with …"

FIGURE 13/1/7 – 1



Mettler Toledo Model Cargoscan CS5200.2 Dimensional Measuring Instrument