

## Template for comments and convener's observations

Date:2019-04-16

Document:

Project:

Country Code <sup>1</sup>	Part	Clause/ Subclause	Paragraph/ Figure/Table	Type of comment <sup>2</sup>	Comments	Proposed change	Convener's responses
0001 IR					No comment at this stage		Thank you.
0002 KR				ge	No expertise in this field.		Thank you.
0003 FR	1			GE	As said for CD1, this type of instrument is patented. (ex n° United States Patent 7870794). These patents would prevent any other manufacturer from positioning itself on this material. <b><u>It is not the function of OIML to issue recommendation based on the technology of a manufacturer.</u></b>		In November 2018, I asked the BIML (Ian Dunmill) to investigate this and report back to us. I am still waiting for a response from him.  General technical requirements and engineering principles are used in this Recommendation with little or no reference to specific manufacturer technology. The instrument design, and how it works is largely left to the manufacturer, as long as it meets the requirements of this Recommendation.
0004 AU	1	1.1, 1.2 and 2.1.4		te	We have concerns about the correctness and consistency of the descriptions and terms given in 1.1, 1.2 and 2.1.4. Centripetal force is the force that makes a body follow a curved path. For arched chute weighers, the arched chute provides this force on the solid matter. Centripetal force increases when the solid matter has greater mass (not to be confused with weight), and when the solid matter flows faster. Gravity causes the solid matter to fall down from the conveyor onto the arched chute, but it is incorrect to say that centripetal force is caused the action of gravity on the force receptor. There would also be a separate force resulting from the action of gravity on the solid matter, and a component of this force would also be felt by the force receptor. 2.1.4 is also inconsistent with the scope both in the descriptions and the terms used. Further, the term <i>arched chute (type) weighers</i> introduced in 1.1 is not used anywhere except in 1.2. And, the term <i>arched chute type totalizing weighing instrument</i> defined in 2.1.4 is not used at all in the document.	Change the clauses as follows:  <i>1.1 Scope</i> <i>This International Recommendation specifies the metrological and technical requirements for arched chute weighers that are subject to national metrological controls.</i>  Remove <i>1.2 Application</i>  <i>2.1.4 arched chute weigher</i> <i>CTAWI that determines weight by measuring the force on a force receptor caused by bulk product that flows vertically onto a circular arched chute</i>	Agree to the change. "Application" deleted. Not mandatory according to OIML B 6-2: 2012E.

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					The scope should not define the instrument, but it should use a defined term. Application should only be used to restrict the use of the kind of instrument to particular applications.		
0005 AU	1	2.1.4		Ed	See AU comment on 1.1, 1.2 and 2.1.4		Amended as proposed.
0006 AU	1	2.2.1		Ed	Refer to <i>arched chute weigher</i> – not <i>instrument</i> Also, suggest to include <i>arched chute</i> in the definition. Also see AU comment on 2.2.1.1	Change to: <i>2.2.1 force receptor</i> <i>Part of the arched chute weigher intended to sense the force induced by the material flow along the arched chute</i>	Agree to amend as proposed.
0007 AU	1	2.2.1.1		Ed	Arched chute weighers use the term <i>arched chute</i> . Why do we introduce the different term <i>slide chute</i> ?	Use the term <i>arched chute</i> throughout the document instead of <i>slide chute</i> .	Agree to replace “Slide chute” with “arched chute” for consistency.
0008 AU	1	2.2.2		Ed	The example should be an example of the equipment not a method.	Change: ( <i>e.g. by means of a conveyor belt</i> ) To: ( <i>e.g. a conveyor belt</i> )	Agree to the proposal.
0009 US	1	2.2.2.		ed/te	In bulk commodity handling systems an auger (screw type conveyor) or other feeding mechanism can be used to deliver product to a weighing system.  For example see: <a href="http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1147&amp;context=biosysengfacpub">http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1147&amp;context=biosysengfacpub</a>	Revise example to include augers (screw type conveyor) and other feeding mechanisms.  (e.g., by means of a conveyor belt, <b><u>auger (screw type conveyor) or other product feed mechanism.</u></b>	Agreed. Including a wider range of feeding mechanisms helps to reduce technological restrictions.
0010 FR	1	2.2.5		TE	A diagram has been added to explain the principle of centripetal force weighing in annex A. However, there is no scientific information to explain why the velocity of the product is not considered as a primary indication and is not measured (only the mention of the discussion during the 13 <sup>th</sup> March meeting). The centripetal force is proportional to the square of the velocity.	Add an explanation to justify the velocity is not a primary parameter.	New diagram and text added in Annex A, (thank you to Switzerland, CH). It illustrates the basic principle of centripetal force weighing.
0011 AU	1	2.2.6		ed	Use consistent wording for product/material etc	Change: ... <i>any material flow passing the force receptor</i> . To: ... <i>any product passing along the force receptor</i> .	Agree to the editorial amendment.
0012 AU	1	2.2.6.3		Ed	No need to repeat the meaning of zero-setting device.	Change: ... <i>without intervention of the operator when no material flow on the force receptor is detected</i> .	Agreed. For consistency with the definition in OIML R76, T.2.7.2.3.

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						To: ... <i>without intervention of the operator</i>	
0013 AU	1	2.2.8		Ed	The term <i>flowrate regulating device</i> is not used in the document. If it is kept for future use, does it relate to product speed or mass flowrate?	Remove.	Agree to remove. Superfluous terminology.
0014 AU	1	2.2.9	Figure 1	Te	What is the meaning of the line on the left of the internal clock, connected to 1? The equivalent figure in R 50 has a line for the displacement transducer because it is a device that interacts with the movement of the belt. An internal clock is not connected in the same way.	Remove the line on the left of 2A internal clock.	Connecting line removed. Internal clock is now linked to the instrument electronics only.
0015 AU	1	2.2.9.1		Ed	<i>force receptor</i> is defined (differently) in 2.2.1.	Keep only one definition – suggest to keep 2.2.1	Agreed. 2.2.9.2 removed.
0016 AU	1	2.2.9.3		Ed	Simplify and improve the wording.	Change to: <i>2.2.9.3 internal clock electronic device that keeps time and is used for the calculation of the measurement result</i>	Agreed. Amended as proposed and inserted in 2.2.8.2.
0017 AU	1	2.3.2		ed	<i>weighing segment length (W<sub>L</sub>)</i> is not used anywhere in the document except for reporting on the test report in Part 3.	Remove.	“weighing segment length” amended and added in 2.3.12. It is used in 4.5.1.1, and in Rxx-2, 9.3.3.
0018 AU	1	2.3.3		Ed	Improve the grammar	Change to: <i>2.3.3 maximum capacity, Max maximum force that the force receptor is intended to measure</i>	Agreed. Wording as proposed.
0019 AU	1	2.3.4		Ed	Improve the grammar	Change to: <i>2.3.3 minimum capacity, Min minimum force that the force receptor is intended to measure</i>	Agreed. Wording as proposed.
0020 AU	1	2.3.5.1, 2.3.5.2, 2.3.5.3		Ed	The definitions should mention <u>mass</u> flowrate	Replace <i>flowrate</i> with <i>mass flowrate</i> in each definition.	Agreed. “mass flowrate” inserted where appropriate.
CH	1	2.3.6		Te	minimum totalized quantity, $\Sigma$ min $\Sigma$ min should be proportional to the flowrate: $\Sigma_{min} = Q_m \times T_{min}$ with $T_{min}$ = minimum totalizing time Explanation: the greater the flowrate is, the greater the centripetal force on the arched plate is, and the greater $\Sigma_{min}$ should be.	Refer to measurement example on comment part 2, section 9.3.2 Performing product tests.	Amended as proposed. The relationship between $\Sigma_{min}$ and $T_{min}$ added. See 2.8.6.

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					Refer to measurement example on comment part 2, section 9.3.2 Performing product tests.		
0021 US	1	2.3.6.		ed	The abbreviation for MPE is used before the term is defined in the document.	Spell out terms the first time they are used in the document when using an abbreviation.	Agreed. All abbreviations reviewed and amended as appropriate.
0022 US	1	2.4.5.4		ed	There is no abbreviation associated with the definition but there is an abbreviation for Fault Limit in 2.7.	Include abbreviation with definition for consistent presentation.	Abbreviations Fault Limit in 2.7 deleted.
0023 US	1	2.6.2		ed	The abbreviation EUT is used before it is defined in Section 2.7. on the following page.	Revise to read "equipment under test (EUT)."	Agreed. Abbreviations to be reviewed and amended as appropriate.
0024 US	1	2.8.2 to 2.8.4.		ed	E should be italicized	Reformat E.	Agreed. Abbreviations to be reviewed and amended as appropriate.
0025 AU	1	2.8.5		Te	$v_{max}$ is not defined. It is assumed to be maximum speed (from R 50), but this is not correct because Max is a force (not mass), and there is no means of measuring the speed of flow. Based on other definitions and Figure 1, $Q_{mmax}$ is determined from information from the force transducer and the internal clock. Is this correct? Note: $v_{min}$ is actually defined as the minimum scale interval of the force transducer (load cell) in clause 6.1.6.6.	Review	Agree. $v_{min}$ deleted and 6.1.6.6 amended. See proposal from Switzerland.
0026 AU	1	2.8.6		Ed	This expression for $Q_{min}$ is a requirement given in 3.5. Definitions should not contain requirements.	Remove.	Agreed. The limit for the minimum mass flowrate removed, as proposed. 3.5 amended.
CH	1	Part 1, sections 2.8.6 & 3.5		Te	Minimum mass flowrate $Q_{min}$ = normally 20 % of $Q_{max}$ , but $\leq 35$ % of $Q_{max}$ Why should a standard or recommendation limit the minimum flowrate ? Why couldn't a weighing system be certified: - with improved accuracy but with a reduced flowrate range ? - with extended flowrate range but with reduced accuracy ?		The limit for the minimum mass flowrate removed, and as proposed. 3.5 amended.

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0027 AU	1	2.8.7		Te	What is meant by <i>time per mass flow</i> ? The expressions refer to $v_{max}$ and $v_{min}$ which are undefined but assumed to be speeds – see AU comment on 2.8.5	Review	“ <i>time per mass flow</i> ” is intended to refer to the duration of each totalization. Proposal is to replace it with “Totalizing time” which is recorded by the internal clock.
0028 AU	1	2.8.8		Te	Similar to AU comments on 2.8.5 and 2.8.7	Review	Amended as indicated above.
0029 AU	1	2.8.8		Te	The expression should be $0.02 \times Q_{max}$ as long as the mass flowrate is expressed in units per hour.	Change to: $0.02 \times Q_{max}$ where $Q_{max}$ is expressed in units of mass per hour.	Amended as proposed.
0030 AU	1	3.1		Ed	Use the term arched chute weigher consistently throughout the document.	Change: ... <i>arched chute type weighing instrument</i> ... To: ... <i>arched chute weigher</i> ... Similarly, use the term <i>arched chute weigher</i> consistently everywhere in the document.	Amended as proposed.
0031 AU	1	3.2.2		Te	The edits to the last paragraph result in a very different meaning to the analogous sentence in R 50 for belt weighers. The paragraph in OIML R 50 is about expanding the MPE by 0.7 when testing with influence quantities on modules with analogue components. The paragraph in 2CD says the MPE is expanded by 0.7 for modules which directly influence the measurement value of the measurand, or an electronic device. So it appears to be about modules where the module itself is associated with an influence quantity (and then separately electronic devices)? The meaning is unclear.	For review.	The text on modules deleted.  See comments from CH and NL.
0032 NL	1	3.2.2		Edit	We feel that it is not appropriate to include requirements on modules under 3.2.2 Maximum permissible errors for influence factor test. We suggest to put them under a separate heading.	Add heading: Apportioning of errors or remove since it is already covered under 6.1.6.7	The text on modules is deleted from 3.2.2.
CH	1	3.2.2		Ed	As the defined factors are proportional to MPE, table 2 is not useful. One could simply say: “The Maximum permissible errors for influence factor tests are $0.7 \times$ MPE defined in table 1 for initial verification.” The statement “rounded to the nearest totalization scale interval, d” is obvious and has not to be		The data is Table 2 is referenced in Part 2, 3.7.3, 7.2.1, Part 3, etc. Table 2 is useful in that the text of calculated data is fully displayed so it can be easily referenced.

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					repeated for partial error contributions.		
0033 UK	1	3.6		ed	Unnecessary comma at the end of numbering b)	Replace the comma with a full stop dot.	Agree to delete.
CH	1	3.7.3.2		Ed	Temperature effect at zero flowrate As the defined factors are proportional to MPE defined in table 1, one could simply say: “The effect of ambient temperature on totalizations at zero flowrate shall not vary by more than 0.07 x MPE per 5 °C of a quantity totalized at the maximum mass flowrate for the duration of the totalization.”		Either method is correct, but it is clearer and simpler with the calculated figures displayed.
0034 US	1	3.7.3.1 & 4.2.1., 4.2.2, 4.6.1, 4.6.2. and others		ed	<p>When a section contains multiple requirements mark appropriately for ease of identification. For example, 3.7.3.1, 4.2.1., 4.2.2, 4.6.1. and others are presented as shown below and use single line spacing to or bullets points to separate the requirements. This approach sometimes causes readability and citation problems. When bullets are used in 4.6.1 and 4.6.2. the reader must count and cite the bullet point which lowers readability. See <b>6.1.1. Documentation</b> for an example which avoids the use of bullets.</p> <p><b>3.7.3.1 Temperature</b></p> <p>The CTAWI shall comply with the appropriate metrological and technical requirements at ambient temperatures from –10 °C to +40 °C unless special temperature limits are specified in the descriptive markings of the instrument (in a form such as “–25 °C / +55 °C”).</p> <p>The range within the temperature limits shall be at least equal to 30 °C.</p> <p>The ambient temperature limits of the CTAWI shall be selected to be appropriate for the local environmental conditions of its use (this may be subject to national regulation).</p> <p><b>4.2.1 Accidental breakdown and maladjustment</b></p>	<p>Reformat these and other sections in Part 1 and Part 2 with appropriate subsection markings (e.g., a, b, c ... or i, ii, iii ...) to improve readability and increase the ease of citation,</p> <p><b>3.7.3.1 Temperature</b></p> <p><b>a.</b> The CTAWI shall comply with the appropriate metrological and technical requirements at ambient temperatures from –10 °C to +40 °C unless special temperature limits are specified in the descriptive markings of the instrument (in a form such as “–25 °C / +55 °C”).</p> <p><b>b.</b> The range within the temperature limits shall be at least equal to 30 °C.</p> <p><b>c.</b> The ambient temperature limits of the CTAWI shall be selected to be appropriate for the local environmental conditions of its use (this may be subject to national regulation).</p> <p><b>4.2.1 Accidental breakdown and maladjustment</b></p> <p><b>a.</b> A CTAWI shall be constructed and installed such that an accidental breakdown or maladjustment likely to disturb its correct functioning can normally not take place without the effect being evident.</p>	<p>Agreed. Broadly amended as proposed.</p> <p>For review by the BIML editor expected. Some of these are paragraphs, subclauses with titles, not lists.</p>

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					<p>A CTAWI shall be constructed and installed such that an accidental breakdown or maladjustment likely to disturb its correct functioning can normally not take place without the effect being evident.</p> <p>Adjustable components that potentially can disturb the metrological performance of a CTAWI shall be held securely and the position of the component shall be accurately and permanently defined.</p> <p><b>4.34.2.2 Adjustments during operation</b></p> <p>It shall not be possible for the general totalization indicating device to be reset to zero.</p> <p>It shall not be possible to reset legally relevant indicating devices unless the flow rate is zero.</p> <p>It shall not be possible to make adjustments which may affect the measurement result unless the flow rate is zero.</p> <p><b>4.6.1 Identification markings</b></p> <ul style="list-style-type: none"> <li>▪ identification mark of the manufacturer,</li> <li>▪ serial number and type designation of the instrument,</li> <li>▪ identification mark on each part of an instrument consisting of separate but associated units,</li> <li>▪ type approval mark,</li> </ul> <p><b>4.6.2 Marking of specifications</b></p> <ul style="list-style-type: none"> <li>▪ mains power voltage ..... V</li> <li>▪ mains power frequency ..... Hz (if applicable)</li> <li>▪ designation of type(s) of product to be weighed</li> <li>▪ density the of product in kg/L or t/m<sup>3</sup></li> <li>▪ particle size of the product in mm or in μm diameter</li> <li>▪ maximum capacity, Max ..... N</li> </ul>	<p><b>b.</b> Adjustable components that potentially can disturb the metrological performance of a CTAWI shall be held securely and the position of the component shall be accurately and permanently defined.</p> <p><b>4.2.2 Adjustments during operation</b></p> <p><b>a.</b> It shall not be possible for the general totalization indicating device to be reset to zero.</p> <p><b>b.</b> It shall not be possible to reset legally relevant indicating devices unless the flow rate is zero.</p> <p><b>c.</b> It shall not be possible to make adjustments which may affect the measurement result unless the flow rate is zero.</p> <p><b>4.6.1 Identification markings</b></p> <p><b>a.</b> identification mark of the manufacturer,</p> <p><b>b.</b> serial number and type designation of the instrument,</p> <p><b>c.</b> identification mark on each part of an instrument consisting of separate but associated units,</p> <p><b>d.</b> type approval mark.</p> <p><b>4.6.2 Marking of specifications</b></p> <p><b>a.</b> mains power voltage ..... V</p> <p><b>b.</b> mains power frequency ..... Hz (if applicable)</p> <p><b>c.</b> designation of type(s) of product to be weighed</p> <p><b>d.</b> density the of product in kg/L or t/m<sup>3</sup></p> <p><b>e.</b> particle size of the product in mm or in μm diameter</p> <p><b>f.</b> maximum capacity, Max ..... N</p> <p><b>g.</b> temperature range ..... °C / ..... °C, (if applicable, see 3.7.3.1)</p> <p><b>h.</b> accuracy class = 0.2, 0.5, 1 or 2</p>	

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					<ul style="list-style-type: none"> <li>temperature range ..... °C / ..... °C, (if applicable, see 3.7.3.1)</li> <li>accuracy class = 0.2, 0.5, 1 or 2</li> <li>totalization scale interval, <math>d = \dots</math> g, kg or t</li> <li>maximum mass flowrate, <math>Q_{\text{max}} = \dots</math> g/h, kg/h or t/h</li> <li>minimum mass flowrate, <math>Q_{\text{min}} = \dots</math> g/h, kg/h or t/h</li> <li>minimum totalized quantity, <math>\Sigma_{\text{min}} = \dots</math> g, kg or t</li> <li>pneumatic/hydraulic pressure, (if applicable)</li> </ul>	<u>i.</u> totalization scale interval, $d = \dots$ g, kg or t <u>i.</u> maximum mass flowrate, $Q_{\text{max}} = \dots$ g/h, kg/h or t/h <u>k.</u> minimum mass flowrate, $Q_{\text{min}} = \dots$ g/h, kg/h or t/h <u>l.</u> minimum totalized quantity, $\Sigma_{\text{min}} = \dots$ g, kg or t <u>m.</u> pneumatic/hydraulic pressure, (if applicable)	
0035 AU	1	3.7.3.3, 3.7.3.4		Ed	Use consistent terms. Arched chute weighers are one type of CTAWI.	Change: <i>CTAWI</i> To: <i>arched chute weigher</i> This applies throughout the document	Agreed. Changed throughout Parts 1 to 3.
0036 AU	1	3.7.5.3, 3.7.5.4		Te	The <i>discrimination ... for zero totalisation and stability of zero</i> requirements been removed on the basis of comments that say “review the need for stability of zero”. Could you please explain why neither of these tests are needed for arched chute weighers? Noting: 1. The discrimination requirement is distinct from the stability of zero requirement. 2. The need for equivalence to belt weighers.	Suggest to retain unless information is provided to explain why they are not needed.	Agreed. Discrimination ... for zero totalisation and stability of zero requirements re-inserted in 3.7.4, and Part 2, 8.3 and 8.4. Accidentally deleted in the previous drafts.
0037 AU	1	4		Te	Consider inserting requirements for the internal clock. The measurement result is critically dependent on the clock and so there should be time-keeping requirements.	Add requirements for internal clocks.	Agree. Propose adding following text in a new clause 4.5.3:  “ <i>The internal clock shall keep track of the time keeps time and is used for the calculation of the measurement result. The following requirements apply:</i>  <i>Time correction shall be secured in accordance with 4.3.7.</i>  <i>In the event of an interruption of the power, the internal clock shall continue to function correctly, in accordance with 5.5.4 and 5.5.5”</i> ”
0038 AU	1	4.2.4		Ed	Grammar	Change: ... <i>without automatic disablement all indications...</i>	Agree to amend as proposed.

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						To: ... without automatic disablement <u>of all indications...</u>	
0039 AU	1	4.4		Te	The text includes ... <i>during no load condition of the force receptor (slide chute)</i> ... This may be misleading because the slide chute (or arched chute) is part of the force receptor, but is not the same thing. Suggest it is sufficient to just say <i>no load condition</i> .	Change: ... <i>during no load condition of the force receptor (slide chute)</i> ... To: ... <i>during no load condition</i> ...	Amended as proposed.
0040 AU	1	4.5.1.2		Te	The convener's response to comments on this requirement in 2WD says "The slide chute length is very important and needs to be specified in the approval documentation Further information on the principle may be needed to add to the Recommendation. Homework for CECIP." To the best of my knowledge, no further information has been provided. Specifically, it is not clear why this recommendation needs to put limits on the radius of curvature of the chute.	Suggest to remove this prescriptive requirement unless it is established why it is needed.	4.5.1.2 amended to make it less prescriptive.
0041 AU	1	4.5.1.2		Te	Item b) under <i>The slope angle of the force receptor</i> ... talks about the <i>slope of the conveyor</i> .	Change: <i>slope of the conveyor</i> To: <i>slope angle of the force receptor</i>	Amended as proposed.
0042 NL	1	4.6.2.  See also 6.1.1.		te	Variations of just a few percent of moisture on hygroscopic materials or a large temperature fluctuation can have a significant impact on measurement accuracy. In addition to particle size and density the certification process must consider the variations in moisture which occur in products (test materials). To ensure accurate measurements of bulk materials the user needs to be informed of the acceptable ranges of moisture and temperature for each product to be weighed.	Amend <b>4.6.2. Marking of Specifications</b> by adding moisture and temperature measuring range for each product to be weighed.  <b><u>n. Designation of the acceptable moisture and temperature range for each product to be weighed.</u></b>	New text added as proposed.
CH	1	4.6.2		Te	Marking of specifications The minimum totalizing time T <sub>min</sub> should be defined instead of the Σ <sub>min</sub> which is dependent on the flowrate: refer to previous comment on section 2.3.6.		Added to 4.6.2 as proposed. Σ <sub>min</sub> left as it may provide useful data

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0043 US	1	4.6.2.  See also 6.1.1.		te	A manufacturer of these instruments advised that variations of just a few percent of moisture on hygroscopic materials or a large temperature fluctuation can have a significant impact on measurement accuracy. In addition to particle size and density the certification process must consider the variations in moisture which occur in products (test materials). To ensure accurate measurements of bulk materials the user needs to be informed of the acceptable ranges of moisture and temperature for each product to be weighed.	Amend <b>4.6.2. Marking of Specifications</b> by adding moisture and temperature measuring range for each product to be weighed.  <b><u>n. Designation of the acceptable moisture and temperature range for each product to be weighed.</u></b>	New text added as proposed.
0044 AU	1	4.7.2		Ge	This clause refers to a strip of lead. Given the health concerns associated with lead, we suggest to remove this reference to lead.	Edit to not specify lead.	Agreed. "lead" removed.
0045 AU	1	5		Ed	The same statement is given in 5.1.4.	Remove the statement under 5.	Agreed. Duplicate statement removed (from 5).
0046 UK	1	5		ed	Unnecessary full stop dot at the end the paragraph.	Remove the additional full stop dot.	Deleted.
0047 AU	1	5.1.1		Ed	What are AGFIs?	Replace <i>AGFIs</i> with <i>Arched chute weighers</i> .	"AGFIs" replaced by" arched chute weighers"
0048 FR	1	5.1.1		edit	It is written "AGFIs shall be so designed and manufactured that they do not exceed the maximum permissible errors under rated operating conditions." This recommendation deals with CTAWIs."	Replace "AGFIs" by "CTAWIs".	"AGFIs" replaced by" arched chute weighers"
0049 NL	1	5.1.1		Edit	It is written "AGFIs shall be so designed and manufactured that they do not exceed the maximum permissible errors under rated operating conditions." This recommendation deals with CTAWIs."	Replace "AGFIs" by "CTAWIs".	"AGFIs" replaced by" arched chute weighers"
0050 UK	1	5.1.1		ed	"AGFI" is mentioned in the paragraph.	Replace "AGFI" with "CTAWI"	"AGFIs" replaced by" arched chute weighers"
0051 US	1	5.1.1		ed	Where is AGFI defined?  <b>5.1.1 Performance under rated operating conditions</b>  AGFIs shall be so designed and manufactured that they do not exceed the maximum permissible errors under rated operating conditions.	Define AGFI	"AGFIs" replaced by" arched chute weighers"

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<sup>2</sup> Type of comment: ge = general te = technical ed = editorial

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0052 NL	1	6.1.1.		te	Variations of just a few percent of moisture on hygroscopic materials or a large temperature fluctuation can have a significant impact on measurement accuracy. In addition to particle size and density the certification process must consider the variations in moisture which occur in products (test materials). To ensure accurate measurements of bulk materials the user needs to be informed of the acceptable ranges of moisture and temperature for each product to be weighed.	Amend <b>6.1.1. Documentation</b> by adding a moisture measuring range for each product to be weighed.  <b><u>p. Designation of the acceptable moisture and temperature range for each product to be weighed.</u></b>	New text added as proposed.
0053 NL	1	6.1.1.		te	How the product enters the chute (manufacturers call this "flow presentation") is critical as dropping it vertically and contacting the curve of the chute incorrectly may cause measurement errors.	Amend <b>6.1.1. Documentation</b> by adding a requirement that specific requirements on the installation and use of product feeding devices be included and that suitable cautions about the effects of improper product flow presentation on the accuracy of the instrument.  <b><u>q. Description of positioning requirements for product flow presentation and suitable cautions about the effect of improper product feeding on the accuracy of the instrument.</u></b>	New text added as proposed.
0054 NL	1	6.1.1.		te	Section 5.1. General Conditions in Part 2 calls for the use of standard weights to simulate mass flow and provides for test weight placement on the "platform" which is described in Section 7.3. Simulation Tests of Part 1. The position of the test load on the weighing platform can affect accuracy so weight placement is critical.	Amend <b>6.1.1. Documentation</b> by adding a requirement that specific requirements on the placement, installation and use of the platform be included and that suitable specifications on test loads to simulate different mass flows be provided (See 5.4.1 in Part 2). The information should also include cautions about minimum and maximum loads as well as the effects of improper loading.  <b><u>r. Instructions on positioning, installation and loading requirements for a platform that can be loaded with weights for use in simulation testing (See Section 7.3)</u></b>	New text added as proposed.

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0055 NL	1	6.1.1.		te	Section 9.3.3. Performing Product Infeed Test requires the performance of this test if the infeed flow is adjustable. The manufacturer should provide appropriate guidance on how to adjust the infeed flow.	Amend <b>6.1.1. Documentation</b> by adding a requirement that instructions for the adjustment of the infeed flow and specific limits on adjustments and appropriate procedures for securing adjusting mechanisms be provided.  <b><u>s. Instructions on adjusting infeed flow and suitable cautions about limits and securing adjustments during the test the infeed mechanism (See Section 9.3.3. in Part 2.)</u></b>	New text added as proposed.
0056 US	1	6.1.1.		te	A manufacturer of these instruments advised that variations of just a few percent of moisture on hygroscopic materials or a large temperature fluctuation can have a significant impact on measurement accuracy. In addition to particle size and density the certification process must consider the variations in moisture which occur in products (test materials). To ensure accurate measurements of bulk materials the user needs to be informed of the acceptable ranges of moisture and temperature for each product to be weighed.	Amend <b>6.1.1. Documentation</b> by adding a moisture measuring range for each product to be weighed.  <b><u>p. Designation of the acceptable moisture and temperature range for each product to be weighed.</u></b>	New text added as proposed.
0057 US	1	6.1.1.		te	How the product enters the chute (manufacturers call this “flow presentation”) is critical as dropping it vertically and contacting the curve of the chute incorrectly may cause measurement errors.	Amend <b>6.1.1. Documentation</b> by adding a requirement that specific requirements on the installation and use of product feeding devices be included and that suitable cautions about the effects of improper product flow presentation on the accuracy of the instrument.  <b><u>q. Description of positioning requirements for product flow presentation and suitable cautions about the effect of improper product feeding on the accuracy of the instrument.</u></b>	New text added as proposed.

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0058 US	1	6.1.1.		te	Section 5.1. General Conditions in Part 2 calls for the use of standard weights to simulate mass flow and provides for test weight placement on the “platform” which is described in Section 7.3. Simulation Tests of Part 1. The position of the test load on the weighing platform can affect accuracy so weight placement is critical.	Amend <b>6.1.1. Documentation</b> by adding a requirement that specific requirements on the placement, installation and use of the platform be included and that suitable specifications on test loads to simulate different mass flows be provided (See 5.4.1 in Part 2). The information should also include cautions about minimum and maximum loads as well as the effects of improper loading.  <b><u>r. Instructions on positioning, installation and loading requirements for a platform that can be loaded with weights for use in simulation testing (See Section 7.3)</u></b>	New text added as proposed.
0059 US	1	6.1.1.		te	Section 9.3.3. Performing Product Infeed Test requires the performance of this test if the infeed flow is adjustable. The manufacturer should provide appropriate guidance on how to adjust the infeed flow.	Amend <b>6.1.1. Documentation</b> by adding a requirement that instructions for the adjustment of the infeed flow and specific limits on adjustments and appropriate procedures for securing adjusting mechanisms be provided.  <b><u>s. Instructions on adjusting infeed flow and suitable cautions about limits and securing adjustments during the test the infeed mechanism (See Section 9.3.3. in Part 2.)</u></b>	New text added as proposed.
0060 AU	1	6.1.5		Ed	This clause separates a) for all instruments and b) for electronic instruments. Based on the definitions and other edits, it appears that all arched chute weighers are electronic. Is this correct?	Replace items a) and b) with 3.7 and 5	Amended as proposed.
0061 AU	1	6.1.6.4		Te	The list does not mention the internal clock.	Add an item for the internal clock.	Agreed. “Internal clock” added. Detailed requirements in 4.5.3.
0062 AU	1	6.1.6.6		Te	The term $v_{min}$ is used here as the minimum scale interval for the force transducer. Is the intention for force transducers to correspond to load cells as they do in R 50? Does this correspondence work? For instance, R 60 defines $v_{min}$ in units of mass, whereas here $v_{min}$ must be in units of force, because Max is a force. See also AU comment on 6.1.6.7	Review the correspondence between force transducers, load cells and OIML R60.	Proposal from Switzerland (CH) implemented.
CH	1	6.1.6.6		Te	Requirement for the force transducers		Amended as proposed.

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					<p>The given formula "<math>v_{min} \leq \text{Max} / (S \times R / \sqrt{N})</math>" implying scale intervals is counter-intuitive and hard to understand. As the accuracy of the weighing system is defined with relative MPE, one could simply say:</p> <p>1) The accuracy class of the load cells must be better or equal the accuracy class of the weighing instrument,</p> <p>In addition, it would be useful to add comments about the total capacity and safety margin:</p> <p>2) The total capacity of load cells must be greater than the capacity of the weighing instrument, including the dead load,</p> <p>3) A safety margin of at least 20 % should be applied when determining the measuring range of load cells: due to eccentric loading or uneven load receptor, the force is never perfectly distributed.</p>		
0063 AU	1	6.1.6.7	Table 4	Te	<p>The heading of the second column is <i>Load cell</i>. Is it valid to replace this with <i>Force transducer</i>?</p> <p>Note 2 of Table 4 and the paragraph below the table refer to OIML R 60. Is any further work required to translate the approval of a load cell to the use of it as a force receptor here?</p>	If correct, replace: <i>Load cell</i> with <i>Force transducer</i>	Amended as proposed. The scope of R 60 applies to load cells that operate using other principles than strain-gauges. The additional test procedures for force transducers are described in 6.1.6.5 and 6.1.6.6, and B.1 in Part 2.
0064 UK	1	6.2.5		ed	"4.8" does not exist in Part 1. Reference should be to "4.6"	Replace "4.8" with "4.6" in the last sentence.	Amended as proposed.
0065 FR	1	6.2.6		TE	<p>It is stated parameters such as density or granulometry have an important influence on the instrument. It is indicated the manufacturer has to provide details of the type of product, density and particle size for which the instrument is suitable for. Moreover, environmental conditions as humidity can have an influence on the product itself (adherence, granulometry). How to manage these parameters in the certification and in the certificate? (This information can be in the documentation but OIML certificate are not detailed). There is a risk to find an instrument placed in service used to weigh a product for which it is not approved.</p>		Adopted the proposals from NL and the US (see comments 0042 and 0043).
0066 UK	1	7.1		ed	The clause to which the text "see Table 3" is referring to should be included.	Insert the text "(see 3.4, Table 3)"	Agree to the proposal.

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0067 AU	1	7.3		Te Items a) and b)	The description of what shall be fitted is unclear in relation to the platform and the slide chute. Item a) says <i>a complete force receptor (including the slide chute) together with a platform which can be loaded with standard weights</i> , then item b) says again <i>a platform which can be loaded with standard weights</i> , but adds <i>(excluding the slide chute)</i> . The platform should be better defined and described.	Add a definition of the platform: <b><i>force simulation platform</i></b> <i>platform designed to be loaded with standard weights for the purpose of simulating a force on the force receptor.</i>  Replace items a) and b) with: <i>a) a complete force receptor (including the arched chute)</i> <i>b) force simulation platform</i>	Agreed Definition added in 2.2.1.2.  Rxx-1, 7.3 moved to Rxx-2, 4, to align with B 6-2 specifications.
0068 AU	1	7.3		Te Item c)	As I understand it, the purpose of item c) (which corresponds to items d) and e) in R 50 for belt weighers) is to enable a comparison between the totalised weight displayed and the totalised weight calculated for the simulation test. For belt weighers, the part that is being simulated is the displacement transducer (hence item e) in R 50 – a displacement simulation device). However, for an arched chute weigher, the part that is being simulated is the force on the force transducer. (The internal clock is not being simulated.) The force is being simulated by a weight placed on a platform and so item c) should enable a comparison between a weight and the resultant force.	Replace item c) with: <i>c) a device enabling the comparison of integrations of a constant load provided by weight(s) applied to the force simulation platform and integrations of constant mass flow as measured by the force receptor.</i>	Agree. Amended as proposed. This is more clearer.
0069 AU	1	7.4		Te	What is the <i>weighing element length dependent multiplication factor</i> ? This is not defined nor mentioned anywhere else in the document! Further, item b) also talks about simulated totalization time span, but there is no simulation of time. In this respect, the internal clock does not correspond to the displacement sensor in R 50. Also see AU comment on 7.3.	Review item b). If there is a <i>weighing element length dependent multiplication factor</i> which does provide the correspondence between a weight placed on the platform and the corresponding mass as measured by the force receptor, this should be defined and incorporated into 7.3 item c). Replace <i>simulated totalization time span</i> with <i>totalization time span</i> .	Agreed. Text is “weighing segment length”.  Defined in 2.3.12 as the “length of the weighing part of the arched chute”. Referenced in 4.5.1.1.  The text “simulated totalization time span” is the totalizing time, or simulated test duration or time to totalize the simulated mass flows. The totalizing time is needed in some of the test reports in Part 3.

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0070 AU	1	7.5		Te	Item b) does not make sense for an arched chute weigher: - there is no load receptor - there is no flow (perhaps there is simulation of mass flow) Further, I know this is based on text in R 50, but I do not understand the text "...five times that at totalisation of $\Sigma_{min}$ ". Could this be made clearer?	Review the text for appropriateness for an arched chute weigher.	7.5 moved to Rxx-2, 4, to align with B 6-2 specifications  Simulated test with increasing loads or decreasing loads. Typically, 5 to 10 different simulated loads (test points) are used. So that the minimum mass flowrate shall be not less than five times the scale interval 'd'. See Rxx-2, 3.7.  "load receptor" changed to "force simulation platform". See comment from AU 0067.  "flow" changed to "simulated mass".
0071 NL	1	General		Te	In general we support the comments made by the United States and added those to this paper and we support the editorials in the UK comments.		Thank you.
CH	1	Part 1, Annex A,			Typical weighing instrument of the arched chute type, We propose the following illustration which is inspired from the OIML bulletin Number 3, July 2016		Diagram added in Annex A. Thank you for the diagram.

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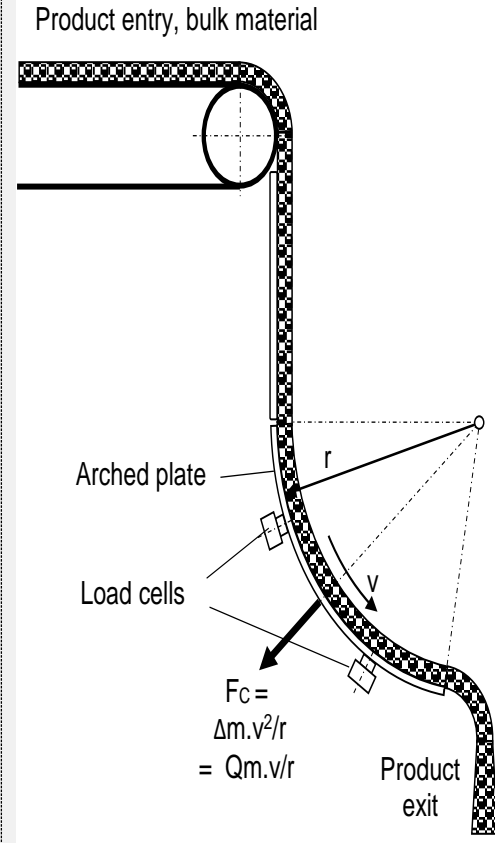


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					 <p>Product entry, bulk material</p> <p>Arched plate</p> <p>Load cells</p> <p><math>F_c = \frac{\Delta m \cdot v^2}{r} = \frac{Qm \cdot v}{r}</math></p> <p>Product exit</p>		
0072 UK	2	2.3		ed	“R xx-1, 4.2 and R xx-1, 4.10” are incorrect	Replace R xx-1, 4.2 and R xx-1, 4.10, with R xxx-1, 4.7	Agree to the editorial amendment.

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CH	2	Part 2, sections 3.7		Te	Evaluation of error 3.7.1 Greater resolution of the control instrument 3.7.3 Indication with a scale interval greater than 0.2 d As the accuracy of the weighing system is defined with relative MPE (and not the rigid definition of MPE at 0.5 e, 1e and 1.5 e as in OIML R76), the greater resolution is anyway recommended in order to simplify the task of verification inspectors and maintenance personal. A coarse resolution that would inhibit the detection of small variation should absolutely be avoided. The section 3.7.1 proposing the use of small weight for low resolution systems is counterproductive. Conclusions: - An improved scale resolution $d = e/10$ should be recommended, - the section 3.7 could disappear.		Applies to the general totalization indicating device.  The option to use a supplementary totalization indicating device (2.4.2.6) with a higher resolution than that of the general totalization indicating device, is available. As specified in Part 1, 7.5.
0073 UK	2	3.7.1		ed	"10.2" is incorrect	Replace the two instances of "10.2" with "9.2 "	Amended as proposed.
0074 UK	2	4.2		ed	"Clauses 8 to 9 xxx." Could be worded better	Propose rewording "Clauses 8 <del>to</del> and 9 shall be applied."	Amended as proposed.
0075 FR	2	5.1		TE	It is indicated "standard weights may be used to simulate the effect of a mass flow". Standard weights do not have the same characteristics than the product. It is known characteristics of the product have an influence. In 9.3, it is written "The weighing accuracy further depends on the product particle sizes and densities." How to take into account the influence of the product if tests are realised with standard weights? We even question the feasibility of these tests.		The basic principle of operation is that the force is being simulated by a weight placed on a platform which enables a comparison between the totalised weight displayed and the totalised weight calculated for the simulation test. The part that is being simulated is the force on the force transducer.  The test in 9.3 is intended to be carried out with the specified products which are or will be used.
0076 AT	2	5.1	1	te	The Requirements for placing the weights on the force receptor are not covering all possibilities.	The sentence: "The test weight ... on the platform" shall be amended by: "if necessary, by using special equipment"	Amended as proposed.
0077 AT	2	5.1	1	te	There may be no differences for testing the zero totalization at $Q_{\min}$ or $Q_{\max}$	Replace " $Q_{\min}$ " by " $Q_{\max}$ "	Amended as proposed.

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0078 UK	2	5.3, 9.2 c) and d)		ed	“separate control instrument” is not defined in the document	Propose deleting “separate”	Agree. Deleted.
0079 AT	2	5.4.3.2	3	te	There may be no differences for testing the accuracy of zero-setting at $Q_{\min}$ or $Q_{\max}$	Replace “minimum mass flowrate” by “maximum mass flowrate”	Amended as proposed.
0080 US	2	7.1.1		ed	Please confirm that the title “Simulated Operation by Test with Static Load without the Force Receiver” is correct. Section 7.3. of Part 1 requires a platform for test weight placement to be attached to the load receptor. Should it read “receptor” not “receiver”?	No change if the Secretariat finds the title is consistent with the requirements in 7.3. of Part 1.	Agree to amend the title. Propose new title:  <i>“Simulation tests (test with static load)”</i>
0081 UK	2	7.2.3	Tables 2 and 3	ed	“R xx-1, 5.1.1 and 5.1.2” is incorrect reference	Reference should be to “R xx-1, 5.1.1”. Delete “and 5.1.2”	Amended as proposed.
0082 US	2	7.2.3.1.		te	Table 2 includes the following statement about the applicability of this test: “This test is considered generally applicable where the measuring instrument is expected to be used in a non-controlled climatic environment.”  As this is written the test is optional. Would the instrument manufacturer be required to declare whether the instrument is intended for use in non-controlled or controlled environments as part of the application? Would the certificate include a suitable statement on environmental suitability requirements?	Provide responses to questions and include additional clarification of how the decision on whether to conduct this test on all or only selected devices.	The statement below was taken from OIML D11. However, agreed that it is superfluous, and so is deleted.  <i>“This test is considered generally applicable where the measuring instrument is expected to be used in a non-controlled climatic environment.”</i>
CH	2	8.2		te	Part 1, section 3.7.4.2 Discrimination of the totalization indicating device Part 1, section 3.7.4.2 Discrimination of the totalization indicating device Part 2, section 8.2 Discrimination of the totalization indicating device As motivated in previous section, if a scale resolution $d = e/10$ would be recommended, the discrimination test wouldn't be required and the section 8.2 could disappear.		The specified tests are useful in situations where a higher resolution is not easily obtainable.  However, to maintain consistency with R50 the discrimination tests are maintained in this Recommendation.

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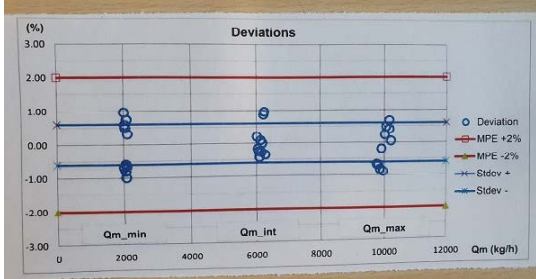
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CH	2	9.3.2			<p><b>Performing product tests</b></p> <p>As dynamic effects are highly likely with this type of weighing system (vibrations, flow rate transitions at start and stop of totalizing, homogeneity variation of the bulk material), mean values and standard deviations should be evaluated on a significant number of weighing. The proposed number of tests (2 pairs at Q<sub>mmax</sub>, 2 pairs at Q<sub>mmin</sub> and 1 pair at intermediate flowrate) is not sufficient.</p> <p>Should be carried out, for each type of product, at least:</p> <ul style="list-style-type: none"><li>- for accuracy classes 1 and 2: 10 totalisations <b>Σ<sub>min</sub></b> at Q<sub>mmax</sub>, Q<sub>mmin</sub> &amp; intermediate flowrate,</li><li>- for accuracy classes 0.2 and 0.5: 20 totalisations <b>Σ<sub>min</sub></b> at Q<sub>mmax</sub>, Q<sub>mmin</sub> &amp; intermediate flowrate.</li></ul> <p>With a normal distribution of results (Gauss curve) and with the standard deviation σ, the probability of an accurate result is (i. e. deviation of measurement below k.σ):</p> <p>68 % with a safety factor k= 1,</p> <p>95 % with k= 2,</p> <p>99.7 % with k= 3.</p> <p>For trade transactions which are legally relevant, the safety factor k= 3 is mandatory.</p> <table><tr><td>Measurement example: Product type</td><td colspan="2">Type 1</td></tr><tr><td>Density</td><td colspan="2">1500 kg/m<sup>3</sup></td></tr><tr><td>Particle size</td><td colspan="2">2 – 4 mm</td></tr><tr><td>T<sub>min</sub></td><td>0.05 h</td><td>Σ<sub>min</sub> = Q<sub>m</sub> x T<sub>min</sub></td></tr><tr><td>Q<sub>m_min</sub></td><td>2000 kg/h</td><td>100 kg</td></tr><tr><td>Q<sub>m_int</sub></td><td>6000 kg/h</td><td>300 kg</td></tr><tr><td>Q<sub>m_max</sub></td><td>10000 kg/h</td><td>500 kg</td></tr></table> <p>The picture below shows the dispersion of results for 3 x 10 totalisation Σ<sub>min</sub> carried out at Q<sub>mmin</sub>, Q<sub>mint</sub> and Q<sub>mmax</sub>:</p>	Measurement example: Product type	Type 1		Density	1500 kg/m <sup>3</sup>		Particle size	2 – 4 mm		T <sub>min</sub>	0.05 h	Σ <sub>min</sub> = Q <sub>m</sub> x T <sub>min</sub>	Q <sub>m_min</sub>	2000 kg/h	100 kg	Q <sub>m_int</sub>	6000 kg/h	300 kg	Q <sub>m_max</sub>	10000 kg/h	500 kg		<p>Agreed. Revised number of tests added as proposed.</p> <p>Also added in Annex D as Informative.</p>
Measurement example: Product type	Type 1																											
Density	1500 kg/m <sup>3</sup>																											
Particle size	2 – 4 mm																											
T <sub>min</sub>	0.05 h	Σ <sub>min</sub> = Q <sub>m</sub> x T <sub>min</sub>																										
Q <sub>m_min</sub>	2000 kg/h	100 kg																										
Q <sub>m_int</sub>	6000 kg/h	300 kg																										
Q <sub>m_max</sub>	10000 kg/h	500 kg																										

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<sup>2</sup> Type of comment: ge = general te = technical ed = editorial

Country Code <sup>1</sup>	Part	Clause/ Subclause	Paragraph/ Figure/Table	Type of comment <sup>2</sup>	Comments	Proposed change	Convener's responses
					 <p>Standard deviation for these 30 totalisations: <math>\sigma = 0.58</math> %</p> <p>If we apply the safety factor <math>k=3</math>, we get <math>3.\sigma = 1.74</math> % : when referring to table 1, this system belongs to accuracy class 2 %. The accuracy class 1 % is out of reach.</p>		
0083 UK	2	9.3.2	4 <sup>th</sup> para	ed	“3.4” in Part 1 is the correct reference.	Insert “Rxxx-1, 3.4”	Agree.
0084 AU	2 & 3			Te	<p>Parts 2 and 3 need to be reviewed for correctness and alignment with part 1. Some of the present issues are:</p> <ul style="list-style-type: none"> <li>- Reference to <i>mass flow device</i> which is not defined or used in Part 1.</li> <li>- References to <i>pulses</i>. It is not clear that an arched chute weigher does or should use pulses in an analogous way to belt weighers. For belt weighers, the pulses relate to the displacement transducer – which is being simulated. For arched chute weighers, the pulses have been associated with the internal clock, but the internal clock is not being simulated. Some references in part 3 say “The pulses sent by the internal clock (or simulator) to simulate slide chute movement” which makes no sense.</li> <li>- References to revolution or revolutions of the conveyor.</li> </ul>	Correct and align with part 1.	<p>Agreed. Parts 2 and 3 reviewed for correctness and aligned with Part 1.</p> <p>References to pulses removed. The test time, and or duration totalization time is more appropriate. The internal clock is expected to provide time information.</p> <p>References to revolution or revolutions of the conveyor also unnecessary and removed.</p>
0085 UK	3	1.1,1.2,1.3,1.4, etc.	Last paragraph	ed	Reference is not the “the last paragraph of” but to “Rxxx-2, 7.1”	Delete the text “the last paragraph of” from all applicable paragraphs and clauses.	Agree. “the last paragraph of” to be replaced with “Rxxx-2, 7.1”

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## Template for comments and convener's observations

Date:2019-04-16	Document:	Project:
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Country Code <sup>1</sup>	Part	Clause/ Subclause	Paragraph/ Figure/Table	Type of comment <sup>2</sup>	Comments	Proposed change	Convener's responses
0086 UK	3	Summary of type evaluation tests		ed	Rows for tests for “1.7.2 Discrimination of the totalization indicating device” is missing.	Insert rows for missing tests in the table.	Agree. Additional rows to be inserted.

C:\Users\MUSSIO\Documents\comments\331-AUSTRALIA-TC9\_SC2\_P9\_Rxxx\_2CD\_Comments\_AU.docx: Collation successful  
 C:\Users\MUSSIO\Documents\comments\331-AUSTRIA-TC9\_SC2\_P9\_Rxxx\_2CD\_Comments\_Austria.docx: Collation successful  
 C:\Users\MUSSIO\Documents\comments\331-FRANCE-TC9\_SC2\_P9\_Rxxx\_2CD\_Comments\_template\_FR.docx: Collation successful  
 C:\Users\MUSSIO\Documents\comments\331-IRAN-TC9\_SC2\_P9\_Rxxx\_2CD\_Comments\_template.docx: Collation successful  
 C:\Users\MUSSIO\Documents\comments\331-KOREA -R.-TC9\_SC2\_P9\_Rxxx\_2CD\_Comments\_KR.docx: Collation successful  
 C:\Users\MUSSIO\Documents\comments\331-NETHERLANDS-20181206-TC9\_SC2\_P9\_Rxxx-1\_2CD\_CTAWIs\_NL.docx: Collation successful  
 C:\Users\MUSSIO\Documents\comments\331-UNITED KINGDOM-TC9\_SC2\_P9\_Rxxx\_2CD\_Comments\_template.docx: Collation successful  
 C:\Users\MUSSIO\Documents\comments\331-UNITED STATES-US Comments TC9\_SC2\_P9\_Rxxx\_2CD 2-8-2019.docx: Collation successful  
 Collation of files was successful. Number of collated files: 8  
 SELECTED (number of files): 8  
 PASSED TEST (number of files): 8  
 FAILED TEST (number of files): 0  
 CCT - Version 4.0/2015

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