

FINAL DRAFT  
RECOMMENDATION

**Draft 1**

49th CIML Meeting

Auckland 2014

INFORMATION

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**Revision of R 117-2**

Dynamic measuring systems for liquids other than water.

Part 2: Metrological controls and performance tests

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ORGANISATION INTERNATIONALE  
DE MÉTROLOGIE LÉGALE

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INTERNATIONAL ORGANIZATION  
OF LEGAL METROLOGY

**Revision of R 117: Dynamic measuring systems for liquids other than water.**  
**Part 2: Metrological controls and performance tests**

**CIML Preliminary Online Ballot**

**Deadline: 2014-07-25**

**Votes cast: Yes: 39 / No: 0 / Abstain: 0 / Did not vote: 21**

**Result: Passed**

AUSTRALIA	Voted Yes on 2014-06-26
AUSTRIA	Voted Yes on 2014-07-02
BELGIUM	Voted Yes on 2014-07-18
BRAZIL	Voted Yes on 2014-07-21
CAMEROON	Voted Yes on 2014-07-23
CANADA	Voted Yes on 2014-06-26
COLOMBIA	Voted Yes on 2014-07-03
CROATIA	Voted Yes on 2014-07-16
CUBA	Voted Yes on 2014-07-16
DENMARK	Voted Yes on 2014-07-01
EGYPT	Voted Yes on 2014-07-23
FINLAND	Voted Yes on 2014-07-08
FRANCE	Voted Yes on 2014-07-17
GERMANY	Voted Yes on 2014-06-24
HUNGARY	Voted Yes on 2014-07-21
IRAN	Voted Yes on 2014-07-08
IRELAND	Voted Yes on 2014-07-02
ITALY	Voted Yes on 2014-07-22
JAPAN	Voted Yes on 2014-07-24
KAZAKHSTAN	Voted Yes on 2014-07-24
KENYA	Voted Yes on 2014-07-03
KOREA (R.)	Voted Yes on 2014-07-25
MACEDONIA (F.Y.R.)	Voted Yes on 2014-07-22
MONACO	Voted Yes on 2014-05-06
NETHERLANDS	Voted Yes on 2014-07-17
NEW ZEALAND	Voted Yes on 2014-07-22
POLAND	Voted Yes on 2014-07-25
PORTUGAL	Voted Yes on 2014-07-17
ROMANIA	Voted Yes on 2014-07-21
RUSSIAN FEDERATION	Voted Yes on 2014-07-22
SAUDI ARABIA	Voted Yes on 2014-07-21
SERBIA	Voted Yes on 2014-05-09
SLOVAKIA	Voted Yes on 2014-07-23
SLOVENIA	Voted Yes on 2014-07-11
SWITZERLAND	Voted Yes on 2014-06-27
TANZANIA	Voted Yes on 2014-07-22
UNITED KINGDOM	Voted Yes on 2014-07-24
UNITED STATES	Voted Yes on 2014-07-25
VIET NAM	Voted Yes on 2014-07-22



## Comment Submission Form

**International Comments on the Draft Recommendation of OIML R 117-2**  
**“Measuring Systems for Liquids other than Water;**  
**Part 2: Metrological controls and performance tests.”**

**All Comments received on the Preliminary Ballot  
and Convener Response**

Dated: 28 July 2014

Ralph Richter  
 Convener of the R117 Project Group  
[ralph.richter@nist.gov](mailto:ralph.richter@nist.gov)

DR date: 5 May 2014

TC 8 / SC 3 Co-secretariats:  
 Germany and the United States

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
NL		Gen.	Thanking the secretariat for all the work and efforts in drafting and while taking into account the planned work in near future on aligning all 3 parts of R 117, as presented in e.g. the special notes on page 3, a positive NL vote is cast on the draft		<p>Thank you!</p> <p>The convener would like to take this opportunity to thank all of the active project group members for all of their significant contributions in the development of OIML R117-2.</p>

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
AU	Explanatory Note. & Clause 5.4	Gen.	<p>Australia strongly objects to the introduction of an exemption from endurance testing for meters “without moving parts”. Instead, such a change should be considered as part of the immediate revision of all 3 Parts of R117. This is for 2 reasons:</p> <p>Firstly, we believe this would require a significant change to Part 1, necessitating a formal revision of that Recommendation, which will not occur outside of the project to immediate revise all 3 parts.</p> <p>Second, little guidance has been provided, and little agreement reached within the TC, on what exactly constitutes a meter “without moving parts”. Does a coriolis meter really have moving parts? Please refer to Annex D (D.3.6) of OIML R 139 which explicitly states that coriolis meters do have moving parts.</p> <p>Regardless, from our experience, the error curve of all meters will shift over time to lesser or greater degrees, and not necessarily on the basis of technology.</p> <p>As a result of this lack of clear definition, we are concerned that the Recommendation will be interpreted very differently from country to country for a significant test, which in turn will result in confusion for manufacturers and suppliers.</p> <p>We strongly recommend that the exemption is not introduced at this time and instead given due consideration as part of the immediate revision.</p>	Remove exemption for meters without moving parts from whole document.	<p>Key issue.</p> <p>However, this issue has already been <u>thoroughly</u> discussed within the project group (and discussed some more).</p> <p>No change to the document at this time.</p> <p><u>Two additional points on this:</u></p> <ol style="list-style-type: none"> <li>1. For the purposes of this document – as clearly stated in Chapter 5 – Coriolis, ultrasonic, and electromagnetic meters are not required to be tested under section 5.4.</li> <li>2. Australia is welcome to raise its concerns on this issue for additional discussion during project group work on the immediate revision of all three parts of R117.</li> </ol>
SE		gen	<p>In the next revision of the documents (R117-2 and R117-3) it is important to align the documents to definitions in OIML B3.</p> <p>As we stated in our comments to the last CD the use of “type evaluation”, “type approval”, “type evaluation report” and “test report” is confusing. The definitions in OIML B3 should be used. In our opinion the outcome of the tests described has more of a test report character (see B3 Annex C). The combination of constituent components should be described in a type evaluation report.</p>		<p>As suggested, this can be fully discussed during the immediate revision.</p> <p>No change to the document at this time.</p>

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
SE		gen	Reference list is missing		Agree that the project group should revise the reference list (currently found in Annex C of R117-1) as part of the immediate revision of all three parts.  No change to the document at this time.
FR	Table of contents	edit	The titles of paragraphs 4.8 and 4.9 have been changed in the text but not in the Table of Contents		Agree – now changed.
JP	Several clauses	edit	There still remain several places where a decimal comma is used. We prefer using a period	Change a decimal comma to a period where needed. The following is some of the expressions to be amended. 5.3.2.2: Table x (p. 50) 0,5 to 1 => 0.5 to 1 5.3.5.2 (p. 51) $\pm 0,2\%$ => $\pm 0.2\%$ 5.3.5.5 (p. 52) -2,5 % => -2.5 % 5.4 (p. 52) 0,8 x Qmax => 0.8 x Qmax	Agree.  Document will be fully reviewed (to ensure consistent use of the decimal period) before publication. (BIML)
JP	Several clauses	Edit	Both upper and lower cases are used for MMQ/mmQ and MPE/mpe.	Use either upper case or lower case for MMQ and MPE.	Agree.  Document will be fully reviewed (to ensure consistent use of <u>uppercase</u> MMQ and MPE) before publication. (BIML)
UK	1,2,2,5.3.2.1,et c.	Edit	Inconsistency in the use of “International Recommendation R 117-1”, “recommendation”, “OIML R117-1”, “R117-1”, throughout the draft. Propose standardising for clarity.		Agree.  Document will be fully reviewed to ensure consistency before publication. (BIML)
UK	Annex List, Table 4.8.5, 5.3.3.1	Edit	The same symbol “*” is used to express the multiplication in several equations, note references and bullet points in several parts of the draft. Propose using different symbols for each application and standardising where applicable.		Disagree.  Believe use of the “*” in multiple ways is OK.
JP	2.2	Gen	The scheme of initial verification is usually specified by the national authority in each member country. We therefore propose adding a note about the initial verification.	Add a note as proposed below for example.  <i>Note 2: Requirements and procedures for the initial verification may be specified separately by the national authority.</i>	No change at this time.  This can be discussed during the immediate revision.
NL	3	edit	<i>U</i> concerns <u>expanded</u> uncertainty (See GUM)	Change accordingly	Agree – changed.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE																
UK	3 Symbols, units and equations	Edit	Blank spaces and misaligned paragraphs, e.g., gaps between Qa and t Time (s), and Uncertainty and Vmin, etc. In the Notes section, the second paragraph needs to be aligned to the left.		OK.  Improved formatting of Section 3 will be done by the BIML before publication. (BIML)																
UK	4.6, 5.3.3, 7.1, etc.	Edit	“Type approval certificate” and “type approval certificate” are used indiscriminately throughout the draft. Propose standardising to ensure consistency.		OK.  Will be double-checked before publication. (BIML)																
UK	Table 4.8.5 Dry heat	Edit	Test procedure in brief The absolute humidity of the test atmosphere shall not exceed 20 g/m <sup>3</sup> . Change border between 5 (and) unit from double line to single line		Agree.  Both done.																
SE	4.8.7	techn	Damp heat cyclic is stated as influence in table 4.8.7 and in 8.2.2 but as a disturbance test in 6.1.4, 6.3.1.3, 6.3.2.3 and 6.4.3.	Change to disturbance test throughout the document (also in line with D11:2013)	Agree.  4.8.7 and 8.2.2 should have been corrected in the 3CD.  Now, both 4.8.7 and 8.2.2 have been corrected to disturbance test.																
FR	4.9.2	edit	paragraph 4.9.2 : the title is missing		Will fix this in the immediate revision.																
AU	4.9.1.1 Test Severity Table, page 26	Tech n.	Regarding the test severity table on page 26 of the marked version: The evaluation condition for the “Surges on AC and DC mains power lines” test should be NSFd, not NSFa. Or at least an option for both NSFa and NSFd should be provided depending on whether intervention is required. See test procedure 4.9.10.	Change NSFa to NSFd. Or provide both options depending on intervention.	Agree.  However, will wait to change this until the immediate revision.																
JP	4.9.1.1 (Second table)	Tec h, Edit	‘Test Level for class’ for the row 4.9.2.2 of the second table should conform to the requirement in ‘Applicability’ in Table 4.9.2.2 for DC mains voltage variation (p.29).	Change the test levels of the row 4.9.2.2 as shown below (in bold). <table><tr><th colspan="3">Test Level (Severity Level) for class</th><th>Test</th></tr><tr><td>E1</td><td>E2</td><td>E3</td><td>R117-2 Section</td></tr><tr><td>1</td><td>1</td><td>--</td><td>4.9.2.1</td></tr><tr><td>1</td><td>1</td><td>--</td><td>4.9.2.2</td></tr></table>	Test Level (Severity Level) for class			Test	E1	E2	E3	R117-2 Section	1	1	--	4.9.2.1	1	1	--	4.9.2.2	Will wait to discuss this in the immediate revision.
Test Level (Severity Level) for class			Test																		
E1	E2	E3	R117-2 Section																		
1	1	--	4.9.2.1																		
1	1	--	4.9.2.2																		

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
JP	4.9.1.1 (Second table)	Edit	Where does '3.6' in the third item (shown below) in 'Guide' refer to?  <i>MPE=Maximum permissible error according to 3.6</i>	Please clarify where '3.6' refers to.	"According to 3.6 removed."
UK	Table 4.9.6 Bursts (transients) on signal, data and control lines	Edit	Object of the test Verification of compliance with the provisions in R117-1, Section 4.1.1 during conditions Test procedure in brief A burst generator as defined in the referred standard shall be used. The		Changed in a different way.  Agree -- fixed.
UK	Table 4.9.7 Surges on signal, data and control lines	Edit	Object of the test Verification of compliance with the provisions in R117-1, Section 4.1.1 during conditions		Changed in a different way.
UK	Table 4.9.8 DC mains voltage dips	Edit	Object of the test Verification of compliance with the provisions in R117-1, Section 4.1.1 under conditions		Changed in a different way.
UK	Table 4.9.9 Ripple on DC mains power	Edit	Object of the test Verification of compliance with the provisions in R117-1, Section 4.1.1 under conditions The frequency of the ripple voltage is the applicable power frequency or a multiple (2, 3 or 6) dependant on the rectifier system used for the mains (as specified in the product specification).		Changed in a different way.  Agree – fixed.
UK	Table 4.9.10 Surges on AC and DC mains power lines	Edit	Object of the test Verification of compliance with the provisions in R117-1, Section 4.1.1 during conditions Test procedure in brief A surge generator as defined in the referred standard shall be used. The		Changed in a different way.  Agree – fixed.
UK	Table 4.9.11 Radiated RF electromagnetic fields	Edit	Object of the test Verification of compliance with the provisions in R117-1, Section 4.1.1 under conditions		Changed in a different way.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
UK	Table 4.9.11.1 Electromagnetic fields of general origin	Edit	Permitted maximum deviation a) for interruptible measuring systems: either significant faults do not occur or checking facilities detect a malfunctioning and act upon in it accordance with 4.3 R117-1, Section 4.3 when significant faults occur,		Changed in a different way.
UK	Table 4.9.11.3 Conducted (common mode) currents generated by RF EM fields	Edit	Object of the test Verification of compliance with the provisions in R117-1, Section 4.1.1 while exposed to electromagnetic fields.		Changed in a different way.
UK	4.10, 4.10.2, 4.10.3, etc.	Edit	The references [aa], [bb], [yy] are not defined in any bibliography.		This will be added in the immediate revision.
SE	4.10.2	edit	The text in the note starting with “The value in parentheses...” is copied from D11 and not applicable.	Delete text.	Agree. Text deleted.
UK	Table 4.10.2 Electrical transient conduction along supply lines	Edit	Object of the test Verification of compliance with the provisions in R117-1, Section 4.1.1 under		Changed in a different way.
UK	Table 4.10.3 Battery voltage variations during starting up a vehicle engine	Edit	Object of the test Verification of compliance with the provisions in R117-1, Section 4.1.1 under		Changed in a different way.
UK	Table 4.10.4 “Load dump” test	Edit	Object of the test Verification of compliance with the provisions in R117-1, Section 4.1.1 under		Changed in a different way.
AU	Figure 5.1	Edit.	Figure 5.1 – Family of meters pyramid, should not be presented across two pages.	Please format such that the figure exists on one page.	Agree. The BIML will ensure this table will be properly formatted before publication (and in such a way that it is only on one page).

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
UK	Fig. 5.1, Families of Meters Pyramid	Edit	Ensure that all the numbers are all together on one page (to produce the complete “pyramid”)		Agree, see response to AU above. <b>BIML</b>
UK	Fig. 5.1, Families of Meters Pyramid	Edit	Fig. 5.1 needs be cantered on a page for clarity.		Agree, see response to AU above. <b>BIML</b>
AU	Table 5.1	Gen.	Regarding Table 5.1 Refer to Australian comments on the Explanatory Note and Clause 5.4.	Remove exemption for meters without moving parts from whole document.	See response to your comment on page 2 of this comment/response document.
UK	5.2 Test equipment	Edit	Second paragraph in the note needs to be aligned to the left		<b>BIML</b> will fix this before publication.
UK	5.2 Test equipment	Edit	To determine the amount of liquid passed through the meter sensor/measuring transducer, a standard test measure (OIML R120), weighing machine <b>(OIML R76)</b> , pipe prover (OIML R119) or master meter can be used.		OK. Added.
UK	5.3.1, X.A.6.4.6.1,etc	Edit	Several references to “line C”, and in many cases no indication that this is referring to Table 2 of the R117-1. Propose standardising to “Line C of Table 2 of R117-1” for clarity and consistency.		Tend to agree. <b>BIML</b> will check all references to “line C” for clarity and consistency before publication.
AU	5.3.2.1 and throughout.	Edit.	It is assumed that the correct clause numbers from Part 3 will be inserted into the relevant test procedure items such as: “1 Fill in test report _____ (R117-3).”	Ensure correct references to Part 3 are included.	Agree. <b>BIML</b> will add these in <u>all</u> sections when R117-3 section numbers are fixed and before publication of both parts.
UK	5.3.2.2	Edit	The table is headed “Table x”. And it is not referenced in the paragraph. Propose numbering the Table and giving it a title “Meter Flow rate tests” In addition, several tables have headings and several have none.		OK. Added title “Drum Meter flow rate tests.”
UK	5.3.3.2.2	Edit	Clause needs to be aligned with paragraph.		OK. <b>BIML</b> .
UK	5.3.4	Edit	Paragraph needs to be moved beneath the clause heading 5.3.4 Flow disturbances.		Comment not understood.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
UK	5.3.4, X.A-1.7.1.6.2, X.A.6.4.6.1 X.A-I.7.1.6.3	Edit	“Alt 1”, “Alt 2”, “ <b>Alternative 1</b> ”, “ <b>Alternative 2</b> ”, “ <b>Method 1</b> ” and “ <b>Method 2</b> ” are used in various parts of the draft. Propose standardising or using a different text such as “Option 1”, “Option 2”.		Changed to “Alternative Method 1” and “Alternative Method 2” in the Section 5.3.4.  Other sections are in the informative annexes and will be discussed during the immediate revision.  <b>BIML</b> will check for other places (outside of Annex X sections) before publication.
UK	5.3.5.6, 5.5, 6.3.1.1	Edit	The text of the Note in some sections are completely in italics, while others are non-italics. Propose standardizing for clarity.		Convener prefers that ALL notes are indented and in italics.  <b>BIML</b> will check this before publication.
SE	5.3.5.6	edit	Change 5.4.5.4, 5.4.5.5. and 5.4.5.6 to 5.3.5.4, 5.3.5.5. and 5.3.5.6.		Believe these sections have been re-numbered.
UK	5.4 Endurance test Object of the test General information	Edit	An endurance test should be carried out at a flowrate between 0,8 x <del>Q<sub>max</sub> and Q<sub>max</sub></del> <b>Q<sub>max</sub> and Q<sub>max</sub></b> of the		Agree ... fixed.
UK	5.5, A.6.4.2, X.A.2.2, X.A.6.4.6.1, X.A-I.7.1.7	Edit	“mmq”, “2 x MMQ” and “2xMMQ” are used throughout the draft.  Propose standardising for clarity		Agree.  Document will be fully reviewed (to ensure consistent use of <u>uppercase</u> MMQ and MPE) before publication. <b>(BIML)</b>
SE	6.1.3	edit	Move 4.10.1 from 6.1.4 to 6.1.3 (influence).		Agree ... fixed.
SE	6.1.4	edit	Move 4.10.1 from 6.1.4 to 6.1.3 (influence).		Agree ... fixed.
UK	6.1.4 Disturbance tests	Edit	4.10.1 <b>{tab}</b> :Voltage variations (road vehicle battery) 4.10.2 : <b>{tab}</b> :Electrical transient conduction along supply lines (road vehicle battery)		Formatting will be fixed before publication by the <b>BIML</b> .
SE	6.1.3	techn	Chapter 6.1 is a general chapter. Delete the text “...of the deliveries and associated measuring instruments..” since AMI may be part of the EUT.		To be discussed in the immediate revision.
SE	6.1.4	techn	Chapter 6.1 is a general chapter. Delete the text “...of the deliveries and associated measuring instruments..” since AMI may be part of the EUT.		To be discussed in the immediate revision.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
AU	6.2.3 and throughout	Tech n.	The acceptance criteria for the Damp Heat Cyclic test in both table 4.7.8 of Part 2 and clause A.4.3 of Part 1 is that: <ul style="list-style-type: none"> <li>All functions operate as designed; and</li> <li>All errors shall be within the MPEs.</li> </ul> It appears as though in several sections of Part 2, the acceptance criteria for this test has been changed to the change in error not exceed the significant fault value. For example, clause 6.2.3.	Correct all acceptance criteria to align with the requirements of Part 1 and Clause 4 of Part 2.	No change at this time.  To be discussed in the immediate revision.
UK	6.3.1 First approach 6.3.1.1 Accuracy tests	Edit	The value of the maximum permissible error for this device is specified in <del>part 1 clause R117-1, Section</del> 2.7.1.2.		Fixed.
UK		Edit	<b>6.3.1.2 Influence factor tests</b>		Fixed.
UK		Edit	The value of the maximum permissible error for this device is specified in <del>part 1 clause R117-1, Section</del> 2.7.1.2.		Fixed.
UK	6.3.1.3 Disturbance tests	Edit	Maximum allowable variation <ul style="list-style-type: none"> <li>For interruptible systems: The value of the maximum permissible error for this device is specified in <del>part 1 clause R117-1, Section</del> 2.7.1.3.</li> </ul>		Fixed.
UK	6.3.2 Second Approach	Edit	For each of these quantities, the minimum, medium, and maximum values are applied. Based on the values represented by the simulated signals, the indications of the quantities are verified. (see <del>part 1: clause R117-1, Section</del> 2.7.2.1.2, Table table 4.1)		Fixed.
UK	6.3.2.2 Influence factor tests of the conversion/cal culator device	Edit	If the signals to simulate the associated measuring devices are digital, the MPE and significant fault limit of the indications are restricted to rounding errors. (see <del>part 1: clause R117-1, Section</del> 2.7.2.1.1)		Fixed.
SE	6.4.1	edit	Table 4.1 is for AMT, table 4.2 is for AMS+AMT=AMD and table 4.3 is for AMS. Depending on what parts are included in the EUT, the relevant table is used.	Clarify.	Clarified.
SE	6.4.2	edit	Add table 4.1.		Added.
UK	6.4.2 Influence factor tests on associated measuring devices	Edit	Maximum permissible error: see <del>part 1, tables R117-1, Tables</del> 4.2 and 4.3.		Fixed. See also SE comment above.
SE	6.4.3	edit	Add table 4.1.		Added.

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SE	7.2.1.1	edit	Change reference to R117-1 from 2.10.1 to 2.10.8 where “added gas up to the values..” is described or change text to “...allowed influence up to values in 2 10 1”.		To be discussed in the immediate revision.
UK	7.2.1 Test of a gas elimination device as a separate unit	Edit	The test liquid should either have the viscosity for which the device is intended or a greater one. If the gas elimination device meets the 0,5 % criterion in R117-1, 2.10.1 with a test liquid of a		Fixed.
UK		Edit	In case of suction (which yields a pressure reduction by suction and by this reproduces the conditions in reality) the pump (before gas is added) must be set to $Q_{max}$ of the gas elimination		Fixed.
UK	7.2.1.1 Gas separator test	Edit	Acc. to R117-1, 2.10.8, a gas separator designed for $Q_{max} \leq 20 \text{ m}^3/\text{h}$ shall ensure the elimination of any proportion by volume of gases relative to the measured liquid; the maximum proportion is 30 % gas for gas separators with a $Q_{max} > 20 \text{ m}^3/\text{h}$ .		Fixed.
UK	7.2.1.1.1 Test procedure	Edit	For each test run at a given gas/liquid ratio start the test run at $Q_{max}$ of the gas separator, at the minimum pressure achievable on the test bench, with the gas inlet closed. When $Q_{max}$ is reached,  Read the liquid volume $V_s$ of the liquid standard and the volume $V_i$ indicated by the liquid meter and calculate $V_n$ . Measurement results gained below $Q_{min}$ shall be disregarded.		Fixed.
UK	7.2.1.2 Gas extractor test	Edit	The other parts of the liquid pipework upstream of the meter must be kept full. The gas pocket is then added to the liquid at $Q_{max}$ of the gas extractor.		Fixed.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
UK	7.2.1.2.1 Gas pocket test	Edit	<p>Make an initial test run without a gas pocket, at <math>Q_{max}</math> of the gas extractor and at the minimum pressure.</p> <p>Test steps</p> <ol style="list-style-type: none"> <li>1. Vent the liquid pipework completely from entrapped gas and create the gas pocket.</li> <li>2. Perform the test run at <math>Q_{max}</math> and the lowest liquid pressure. When <math>Q_{max}</math> is reached, open the gas reservoir / the injection valve to discharge the gas pocket into the liquid stream.</li> <li>3. After the gas extractor had acted upon the gas pocket, the flow rate will resume <math>Q_{max}</math>; continue the delivery at <math>Q_{max}</math> and stop it when the test volume of the liquid is reached.</li> </ol>		Fixed.
UK	7.2.1.3 Special gas extractor test	Edit	<p><i>Note:</i> The maximum achievable flow rate for MS on road tankers with gravity discharge is normally below <math>Q_{max}</math> of the special gas extractor.</p>		Fixed.
UK	7.2.1.4.1 Residual discharge test from the supply tank	Edit	<p>One initial test run must be carried out by delivering the liquid quantity until the pipe is empty and the delivery stops. Then</p> <p>A test run is carried out with a test volume corresponding to <math>Q_{max}</math> of the special gas extractor during 1 minute.</p> <p><i>Note:</i> When the standard is a proving tank and the volume of the delivered liquid is below the nominal capacity of the proving tank, it is necessary to fill up the proving tank to its nominal capacity. To do so, the supply tank is refilled and a corresponding volume is delivered at <math>Q_{max}</math> into the proving tank without gas being added.</p>		Fixed.
UK	7.2.1, 7.2.1.1, 7.2.1.2	Edit	“Qmax” and “Qmin” are used in several parts of the draft with and without a subscript. Propose standardising in accordance with the symbols.		Agree. <b>BIML</b> will double-check this before publication.
SE	7.2.1.4	edit	Note, third black bullet, change from “..covers the cases.” to “..covers the cases:”		Agree. Fixed.
SE	7.2.2.1.1	edit	Reference to fig 4 (do not exist) in annex X.7.4 is changed to fig1?		Agree. Changed to Fig. 1.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
UK	7.2.2 Tests of a gas elimination device forming part of a measuring system (MS) during type approval of the measuring system	Edit	<p>The test liquid should be the same as that for which the measuring system is intended. If the gas elimination device meets the 0,5 % criterion of R117-1, 2.10.1 with</p> <p>The test volume of a test run shall be at least the volume of liquid without gas, delivered during 1 minute at <math>Q_{max}</math> of the gas elimination device.</p>		Agree. Fixed.
UK	7.2.2.1.1 Test procedure for gas separators of fuel dispensers	Edit	<p><i>Note: The tests are carried out in accordance with 7.2.1.1.1.</i></p> <p><i>Note: According to R117-1, 2.10.8, a gas separator designed for <math>Q_{max} Q_{max} \leq 20</math> m<sup>3</sup>/h shall ensure the elimination of any proportion by volume of gases relative to the measured liquid. As <math>Q_{max} Q_{max}</math> of fuel dispensers is always <math>\leq 20</math> m<sup>3</sup>/h, the fuel dispensers must be tested whether</i></p>		Agree. Fixed.
UK	7.2.2.3 Special gas extractor tests  Special gas extractors intended for MS on road tankers	Edit	This Recommendation is not intended to prevent the development of new technologies, which might accomplish the same objective without such an automatic stop-valve; for such cases, new testing procedures may need to be developed to verify that such a (new technology) special gas extractor meets all of the requirements of R117-1, 2.10.1 and 2.10.9.		Fixed.
UK	8.1 General Information 8.1.2	Edit	(b) As soon as the battery voltage has dropped to a value specified by the manufacturer as the minimum value of voltage where the device complies with metrological requirements, this shall be detected and acted upon by the device in accordance with Section 4.2 of R117-1 R117-1, Section 4.2.		Fixed.
SE	8.2.2	techn	Damp heat cyclic is stated as influence in table 4.8.7 and in 8.2.2 but as a disturbance test in 6.1.4, 6.3.1.3, 6.3.2.3 and 6.4.3.	Change to disturbance test throughout the document (also in line with D11:2013)	Agree. Fixed. (See also response to SE on Section 4.8.7.
SE	8.5.2	edit	For second approach, change reference to 6.3.2.2. and 6.3.2.3.		To be discussed in the immediate revision.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
UK	8.5.2	Edit	Disturbance and Influence factors tests for digital conversions devices not fulfilling the requirements of 8.1.1, and analogue conversion devices		Disagree.
UK	8.5.3	Edit	Tests for digital conversions devices not fulfilling the requirements of 8.1.1, and analogue conversion devices powered by a road vehicle battery		Disagree.
JP	Annex A	Edit	“Temporary Note” is not suitable for a Draft Recommendation.	Please delete “Temporary Note”.	The word “temporary” was removed and the text of the note was improved.
UK	A.1 General Information	Edit	{remove highlighting from:} Test procedures in Annex A are applicable for fuel dispensers and		Leave for now. <b>BIML</b> will improve formatting before publication.
UK	A-L.2.4 Check of reverse flow prevention	Edit	Note on OIML R117-1 - 2.13.4:  <i>{format paragraph to remove “paragraph” mark following the word “direction” – see below}</i>  <i>“2.13.4 When reversal of the flow could result in errors greater than the minimum specified quantity deviation, a measuring system (in which the liquid could flow in the opposite direction when the pump is stopped)</i>		Agree. Fixed.
JP	A-L 6.4.5.1	Edit & Tech.	In the last sentence, “ <b>Downstream</b> pressure maintaining device” seems incorrect. We consider that the pressure should be measured before (upstream of) the pressure maintaining device. In addition, this whole sentence is difficult to understand.	We propose the following changes (in <b>bold</b> ) for clarification, including the correction of upstream/downstream.  <i>Liquid pressure (PL) shall be read <b>at a point downstream of the measuring system and upstream of the pressure maintaining device.</b></i>	Agree. Text improved for clarification.
SE	B.2.1	edit	Evaluation of non-return valve configuration and reverse count detection is not included in chapter 5. Refer to 4.7.		OK. Fixed
SE	B.3.4	techn	Test procedure, point 6. Add a sentence first in the point: Coil hose on hose reel. (See R117-1, 2.15)		Not added at this time.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
UK	B.3.4 Variation in the internal volume of the hose (full hose measuring systems only) Test procedure:	Edit	<i>Note: {the note contains several additional spaces between parts of the text, which should be removed}</i>		Fixed.
SE	B.3.5	edit	In R117-1 2.1 the demand is a residue of liquid in the hose of max half of MSQD, no demand of repeatability.		To be discussed in the immediate revision.
UK	E.4.2 Gas elimination devices for MS for beer and other foaming potable liquids	Edit	The test report must state $Q_{max}$ $Q_{max}$ and the upper and lower pressure of the gas elimination device.  Care shall be taken when installing the gas elimination device into the MS that $Q_{max}$ $Q_{max}$ and $P_{max}$ $P_{max}$ of the MS match with the rated operating conditions of the gas elimination device.		Fixed.
UK	E.6.1.2 Test of the special gas extractor function of the air elimination device	Edit	The efficiency of the air elimination device (expressed by the meter error $E_{(with\ gas)} - E_{(without\ gas)}$ ) $E_{(with\ gas)} - E_{(without\ gas)}$ can be determined appropriately only for meter types which count the air according to its real volume (such as PD meters). When the meter type does not count the real gas volume (which might be the case e.g. with electronic meters) then $E_{(with\ gas)}$ $E_{(with\ gas)}$ is also affected by an unknown effect of the air on the meter. No problem exists when the air elimination device - tested by another meter type than a PD meter - complies and the MS is then approved for this combination under test.		Fixed.
UK	E.6.1.3 Accuracy test for delivering MS for milk	Edit	- Test of MMQ, at any flow rate between $Q_{min}$ and $Q_{max}$ $Q_{min}$ and $Q_{max}$ , three independent and identical measurement runs.		Fixed.
UK	E.6.1.4 Test of the air elimination device for delivering MS for milk	Edit	Tests on gas elimination devices should be carried out for flow rates up to $Q_{max}$ $Q_{max}$ of the MS.		Fixed.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
UK	E.6.1.4.1 Tests on gas separators	Edit	<p>The requirements of R117-1, 2.10.1 and 2.10.8 shall be complied with under test conditions such that <math>Q_{max}</math> <math>Q_{max}</math> of the MS is reached when no air enters.</p> <p><b>Test procedure</b></p> <ul style="list-style-type: none"> <li>- All measurements must start with the air inlet closed, and the hose full and pressurized. All measurements must finish with the air inlet closed and the hose pressurized.</li> <li>- Determine the error curve of the meter from <math>Q_{min}</math> to <math>Q_{max}</math> <math>Q_{min}</math> to <math>Q_{max}</math> of the MS.</li> <li>- Start each test run at <math>Q_{max}</math> <math>Q_{max}</math> of the MS. Then introduce air, regulating the air flow by using the air inlet control valve. Follow the test steps below.</li> </ul> <p>If there is no liquid flow for more than 10 seconds, close the air inlet and terminate the test run until the test quantity of the liquid is reached.</p> <ul style="list-style-type: none"> <li>- Measurement results gained below <math>Q_{min}</math> <math>Q_{min}</math> shall be disregarded.</li> <li>- Calculate the error of the gas separator by taking the error curve</li> </ul> <p><b>Test steps</b></p> <ol style="list-style-type: none"> <li>1. Set the entry of air to 0%.</li> <li>2. Vent the liquid pipework completely from entrapped air.</li> <li>3. Make a test run at <math>Q_{max}</math> <math>Q_{max}</math> of the MS.</li> <li>4. Make the test run at <math>Q_{max}</math> <math>Q_{max}</math> by adding air of the required proportion. Start the test run with the air inlet closed. When <math>Q_{max}</math> <math>Q_{max}</math> is reached add air by regulating the air flow by the air inlet control valve.</li> </ol>		Fixed.
UK	E.6.1.4.2 Tests on gas extractors	Edit	<p><b>Test steps</b></p> <ol style="list-style-type: none"> <li>1. Vent the liquid pipework completely from entrapped air.</li> <li>2. Make a test run by setting the MS to <math>Q_{max}</math> <math>Q_{max}</math> and add the air pocket to the liquid.</li> <li>3. For adding the air pocket during the delivery: After the gas extractor had acted upon the air pocket, the flow rate will resume <math>Q_{max}</math> <math>Q_{max}</math>; continue the delivery at <math>Q_{max}</math> <math>Q_{max}</math> and stop it by the delivery valve of the MS, as soon as the test quantity of the liquid is reached.</li> </ol>		Fixed.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
UK	E.6.2 MS for beer and other foaming liquids	Edit	- Test at $Q_{min}$ , $Q_{max}$ and at 2 intermediate flowrates evenly spaced over the flowrate range.		Fixed.
UK	E.6.2.1 Accuracy test	Edit	<p><i>Note: <math>Q_{max}</math> of the MS is considered to be the maximum flow rate attained during the test runs.</i></p> <p><i>Note: OIML R117-1, 2.3.3.3 requires for MS a ratio of <math>Q_{min}, Q_{max} \geq 5:1</math> (this ratio is defined by <math>Q_{min}</math> of the meter and by <math>Q_{max}</math> of the MS). This ratio may be less, but the MS shall be fitted with an automatic checking device to detect when the flowrate of the liquid to be measured is outside the restricted flowrate range. In case of MS for beer and other foaming liquids, for quality reasons of the delivered liquids it is to keep <math>Q_{max}</math> low (flow speed below 2 m/s in order to avoid a big shear force at the pipe surface which deteriorates the quality of the liquid), whereas the nominal size of the meter shall be relatively high (consequently <math>Q_{min}</math> of the meter is adequately high), so that the actual ratio <math>Q_{max}:Q_{min}</math> for such MS may be below 5:1.</i></p> <p>- Test of MMQ, at any flow rate between <math>Q_{min}</math> and <math>Q_{max}</math> three independent and identical measurement runs.</p>		Fixed.
UK	F.1 General Information	Edit	In accordance with Section 2.10.4 of part 1, higher viscous liquids are covered by Annex F, but are not required to have gas elimination devices fitted. In this case, provisions must be made to prevent the entry of air into the system as per <u>section 5.7.2 of part 1, R117-1, Section 5.7.2.</u>		Fixed.
UK	F.1.1 Type Approval	Edit	Measuring systems on pipelines and systems for loading of ships (to be referenced as “Measuring Systems” for the remainder of this annex section) consist of several constituent elements. These constituent elements may or may not be subject to a separate type approval. According to <u>6.1.1 of part 1 R117-1, Section 6.1.1</u> , the constituent elements of a measuring system shall comply with the relevant requirements.		Fixed.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
UK	F.2.1 Testing procedures for meter sensors, measuring devices and meters with mechanical indicating devices	Edit	Notes: • Reverse flow prevention as per <del>section 5.7.3 of part 1 R117-1</del> <b>Section 5.7.3</b> (Uni-Directional System) and reverse count detection (Uni-Directional and Bi-Directional Systems) shall be verified. • A Sampling device (if present) shall be verified as per <del>section 5.7.4 of part 1 R117-1</del> <b>Section 5.7.4</b>		Fixed.
UK	F.2.2 Testing procedures for electronic devices: calculator, correction, indicating, and associated devices	Edit	If the ratio between the maximum and minimum flow rate of the measuring system is less than 5, verify that the requirements of <del>section 5.7.1 of part 1 R117-1</del> <b>Section 5.7.1</b> are fulfilled.		Fixed.
UK	F.2.3 Testing procedures for gas elimination devices	Edit	Notes: 1) System shall meet the requirements of <del>section 5.7.2 of part 1 R117-1</del> <b>Section 5.7.2</b> "Prevention of gas flow" from part 1. 2) If system is not fitted with a gas elimination device, the requirements of <del>Sections 2.10 and 5.1.3 of part 1 R117-1</del> <b>Section s 2.10 and 5.1.3</b> shall be fulfilled.		Fixed.
AU	X.5.3.4	Edit.	The second dot point has been repeated. The repeated wording should be deleted.	Deleted repeated wording.	Fixed.
SE	X.A.2.2.e	edit	Change reference from 2.5.1 to 2.5.3 in R117-1.		Agree. Changed.
SE	X.A.6.4.6	edit	Renumber from X.A 6.4.6 to X.A.6.4.3.		<b>BIML</b> will ensure numbering is correct before publication.
SE	X.A.6.4.6.1.a	edit	Change "...with correction" to "...with conversion".		OK. Changed.
SE	X.A-I.7.1.2 c and f	techn	Where does the demand of 5 sec at zero indication come from? Delete!		To be discussed in the immediate revision.
SE	X.A-I.7.1.3 d	techn	Where does the demand of 5 sec at zero indication come from? Delete!		To be discussed in the immediate revision.
SE	X.A-I.7.2.1 c	techn	R117-1 2.5.3????????		Reference deleted.

Country Code/ Org	R117-2 Section	gen./ edit./ tech.	COMMENT	PROPOSED CHANGE	CONVENER RESPONSE
SE	X.A-I.7.2.3 c and f	techn	Where does the demand of 5 sec at zero indication come from? Delete!		To be discussed in the immediate revision.
SE	X.A-I.7.2.4 d	techn	Where does the demand of 5 sec at zero indication come from? Delete!		To be discussed in the immediate revision.
UK	Annex X.E	Edit	There's a "temporary note" in this section. Need to decide whether to keep or delete it before final publication.		Removed word "temporary" from the note.