

## Economic Commission for Europe

### Inland Transport Committee

#### Working Party on the Transport of Dangerous Goods

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#### Joint Meeting of the RID Committee of Experts and the Working Party on the Transport of Dangerous Goods

Bern, 23-27 March 2015

Item 3 of the provisional agenda

#### Standards

### **Tanks and Standards: EN 12972:2014 Tanks for transport of dangerous goods – Testing, inspection and marking of metallic tanks – Addendum to paper 2015/15**

#### **Transmitted by the Government of the United Kingdom**

1. Working paper ECE/TRANS/WP.15/AC.1/2015/15 submitted by the Government of the United Kingdom sets out particular concerns raised by the national members from the United Kingdom in relation to EN 12972:2014 (now EN 12972:2015). The paper proposes, in light of those concerns, that it would not be appropriate for the standard to be referenced in RID/ADR. The concerns arose from a series of comments submitted by the national members from the United Kingdom which were not properly addressed by the CEN Working Group. Accordingly, the United Kingdom has submitted detailed comments to the CEN representative in advance of the meeting of the Standards Working Group (see INF.28). These and some further comments are reproduced below for the Joint Meeting and the Standards and Tanks Working Groups. The national members from the United Kingdom advise that these comments do not represent the totality of our concerns with the technical content of the standard, but they are given in support of our contention that the standard is not suitable to be referenced in RID/ADR. When work begins to revise the standard the United Kingdom will submit proposals to the CEN Working Group to amend the text of the standard.

2. The table below contains the 48 comments submitted to the CEN representative in advance of the meeting of the Standards Working Group and shown in paper INF.28 transmitted by CEN. However, although these comments have, for the sake of transparency, retained the same comment numbers as in paper INF.28, many of these comments have been revised to improve clarity and provide further information. These revisions are identified by the use of the word 'revised' in column 1. Also, a further 23 comments have been added and these are interspersed at the appropriate position in the table so as to follow the number order of the clauses in the standard. These new comments are identified as UK A, UK B, UK C etc.

FprEN 12972:2014 WI 296067		Tanks for transport of dangerous goods - Testing, inspection and marking of metallic tanks			
Country	Clause No.	Comment (justification for change)	Proposed change	Comment from CEN Consultant	Comment from WG Standards
UK A	1	<p>It is proposed that the standard should include portable tanks in its scope. It needs to be made clear in this section that the only body which can authorise this standard as a <i>mandatory</i> document for portable tanks governed by Chapters 4.2 and 6.7 of the RID/ADR is the United Nations Subcommittee of Experts on the Transport of Dangerous Goods. It must be made clear in the standard that all references to the inspection and marking of metallic UN portable tanks have an “informative” status only and are not “normative”. This change is necessary to make clear that the standard is not legally binding on the territories of the RID Signatory States / ADR Contracting States and, ipso facto to the Signatory States of ADN.</p> <p>There should be no confusion for readers of the standard as to how it relates to first generation IMO Portable Tanks, IM specification portable tanks (USA) nor second generation UN portable tanks.</p> <p>There is no objection to the use of the standard once it has been satisfactorily amended as <i>guidelines</i> for carrying out inspections and tests of first generation or second generation portable tanks.</p> <p>The UK proposes that the text of section 1 of</p>	<p>Section 1, Scope, to should be amended to read “This European Standard specifies the testing, inspection and marking for the type approval, initial inspection, periodic inspection and exceptional checks of metallic tanks (shell and equipment) for fixed tanks, (tank vehicles), demountable tanks, rail tank wagons, <del>portable tanks</del> for the transport of dangerous goods.</p> <p>The standard may be used as guidelines for the testing and testing for the type approval, initial inspection, periodic inspection and exceptional checks of metallic tanks (shell and equipment) for IMO portable tanks and UN portable tanks for the transport of dangerous goods.</p> <p>The marking of UN portable tanks data plates shall be in accordance with the provisions set forth in Chapter 6.7 of the United Nations Recommendations on the Transport of Dangerous Goods</p>		

		the standard is amended accordingly. Alternatively, the standard could be modified to exclude all references to portable tanks.	– Model Regulations.”		
UK B	3.1	The definition of “capacity” should be reviewed because of the adoption of a revised definition of “tank shell” in the 2015 edition of the RID/ADR, Chapter 1.2.	No textual revision is proposed; the definition of “capacity” to be reviewed for consistency with the revised definition of tank shell.		
UK 1	3.2	Misuse of the term “expert” which replaces the term “inspector” throughout the document, changes the definition of terms used in ADR / RID The term ‘expert’ is not defined within ADR or any Standard	Delete Definition of ‘Expert’ Whole document Revert back to ‘Inspector’ as EN 12972:2007 version		
UK 2	4.2.1 2 <sup>nd</sup> Para.	ADR 6.8.2.3.4 Modifications to tank design for type approval is not sufficiently detailed; new text to be added to 4.2.2.2; 5.2.5 to be amended	add reference number to new sub-clause		
UK C	4.2.1 2 <sup>nd</sup> Para.	There are no similar rules in Chapter 6.7 for UN portable tanks for when a variation in design may take place without the need for a new approval. If the Joint Meeting considers that similar provisions should be made for UN portable tanks, a proposal should be made to the United Nations Subcommittee of Experts on the Transport of Dangerous Goods except for when portable tanks are to be manufactured to the same basic design but with a reduced capacity.	Add the following text in 4.2.1, perhaps at the end of this subsection if it is decided to retain UN portable tanks in scope of the standard on a voluntary basis:  “For permitted variations of UN portable tanks without the need for a new type approval see Chapter 6.7 of the United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations and the requirements for the Dynamic Longitudinal Impact Tests prescribed in the United Nations Recommendations on the Transport of Dangerous		

			Goods Manual of Tests and Criteria, Part IV, Section 41.”		
UK 3	4.2.2.2	ADR 6.8.2.3.4 Modifications to tank design approval is not sufficiently detailed	add new text: The inspection for type approval in the case of a modification of a tank with a valid, expired or withdrawn type approval, the testing, inspection and approval are limited to the parts of the tank that have been modified. The modification shall meet the provisions of ADR applicable at the time of the modification. For all parts of the tank not affected by the modification, the documentation of the initial type approval remains valid.		
UK 4 revised	4.3.1	Add Vacuum Test to the required sub-clause 6.7.4.14.4 Refrigerated Liquefied Gases – Portable Tanks NB: The requirement at 6.7.4.14.4 is not strictly speaking a requirement for an actual vacuum test in the jacket, merely, that a reading should be taken; the implication of is that there should be as near perfect vacuum conditions as one can achieve.  6.8.3.4.7 Class 2 LPG - Fixed Tanks (Tank-Vehicles), Demountable Tanks and Tank-Containers And Tank Swap Bodies  For UN portable tanks for liquids and solids there are two design criteria – either designed for -0.21 bar and then fit a vacuum relief valve or design for at least -0.4 bar in which case the vacuum relief valve shall not be needed. Chapter 6.7 does not require these	“For vacuum testing requirements for UN portable tanks see Chapter 6.7 of the United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations.”  NB FE-analysis may not be applicable in the case of cryogenic tanks.		

		tanks to be tested to ensure they can withstand the required minimum negative pressure, only to calculate for it and fit the vacuum relief valve as called for.  6.10.2.2 Vacuum Operated Waste Tanks	- vacuum test (see 5.7, only if required and if no calculation or FE-analysis has been provided)		
UK 5	4.4.1	Add Vacuum Test to the required sub-clause 6.7.4.14.4 Refrigerated Liquefied Gases – Portable Tanks 6.8.3.4.7 Class 2 LPG - Fixed Tanks (Tank-Vehicles), Demountable Tanks and Tank-Containers And Tank Swap Bodies 6.10.2.2 Vacuum Operated Waste Tanks	- vacuum test (see 5.7, only if required and if no calculation or FE-analysis has been provided)		
UK 6	4.5.1	Add Vacuum Test to the required sub-clause 6.10.2.2 Vacuum Operated Waste Tanks  (See comment 4.3.1 above)	- vacuum test (see 5.7, only if required and if no calculation or FE-analysis has been provided)  (See comment 4.3.1 above)		
UK 7	4.6.1	Add Vacuum Test to the required sub-clause 6.7.4.14.4 Refrigerated Liquefied Gases – Portable Tanks 6.8.3.4.7 Class 2 LPG - Fixed Tanks (Tank-Vehicles), Demountable Tanks and Tank-Containers And Tank Swap Bodies 6.10.2.2 Vacuum Operated Waste Tanks  (See comment 4.3.1 above)	- vacuum test (see 5.7, only if required and if no calculation or FE-analysis has been provided)  (See comment 4.3.1 above)		
UK 8 revised	4.6.1	Is prescriptive; “ .. shall be carried out ..”; ADR 6.8.2.4.4 allows that the exceptional check may be performed fulfilling a Periodic or Intermediate test. Therefore not all the 7 requirements listed are applicable to an Intermediate test.	Amend text		

		If mention of portable tanks is to be retained in the standard on a voluntary basis, add text to 4.6.1 as shown.	<p>The exceptional check after damage to the shell which can have impaired the safety of the tank shall be carried out in accordance with the following subclauses depending on whether the test is considered to be an intermediate periodic inspection or a periodic inspection (see 8.2.4.4 of RID / ADR)”</p> <p>Then add:</p> <p>“For UN portable tanks see Chapter 6.7 of the United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations.”</p>		
UK 9 revised	4.6.2	A wider definition of repair that includes the “replacement” of devices and equipment defined in RID / ADR as “service equipment”.	<p>Amend text</p> <p>“The exceptional check after the repair or replacement of service equipment as defined in RID / ADR shall be carried out in accordance with the following sub-clauses to the extent possible.”</p>		
UK 10 revised	4.6.3	Is prescriptive; “.. shall be carried out ..”; ADR 6.8.2.4.4 allows that the exceptional check may be performed fulfilling a Periodic or Intermediate test. Therefore not all the requirements listed are applicable to an Intermediate test.	<p>Amend text</p> <p>“The exceptional check after the repair or replacement of service equipment as defined in RID / ADR shall be carried out in accordance with the following sub-clauses to the extent possible.”</p>		

UK 11	5.2.2.2	The purpose of the examination of documents is not made clear and the user of the standard is given no advice or guidance	Add / Amend text.		
UK 12 revised	5.2.5	ADR 6.8.2.3.4: Modifications to tank design approval is not sufficiently detailed	add sub-clause and new text: The inspection for type approval in the case of a modification of a tank, are limited to the parts of the tank that have been modified. The modification shall meet the provisions of ADR applicable at the time of the modification. For all parts of the tank not affected by the modification, the documentation of the initial type approval remains valid.		
UK 13	5.3.1	ADR 6.8.2.3.4: Modifications to tank design approval is not sufficiently detailed	add sub-clause and new text: The inspection for type approval in the case of a modification of a tank, are limited to the parts of the tank that have been modified. The modification shall meet the provisions of ADR applicable at the time of the modification. For all parts of the tank not affected by the modification, the documentation of the initial type approval remains valid.		
UK 14 revised	5.3.6	ADR 6.7.3.15.3 and 6.7.4.14.3: Require “.. <i>All welds subject to full stress level in the shell shall be inspected during the initial test by (NDT) ...</i> ”	Amend text only if the document is going to continue to cover on a guideline basis Chapter 6.7 tanks.		
UK 15 revised	5.3.6	ADR 6.7.3.15.3 and 6.7.4.14.3 Allows that the NDT testing does not apply to the jacket; this is not detailed	Add new text only if the document is going to continue to cover on a guideline basis		

			Chapter 6.7 tanks.		
UK D	5.3.6.2, 5.3.6.3 and 5.3.6.4	The standard provides rules for the non-destructive testing of tanks where weld efficiency factors (lambda values) have been used as part of the process for determining shell thickness; the use of weld efficiency factors for this purpose is not prescribed for UN portable tanks of Chapter 6.7. Therefore these provisions in the standard cannot be made “normative” for UN portable tanks.	Amend text if Portable tanks are to remain in scope of this standard on a guideline basis only to read in each of these subparagraphs: “Not applicable to UN portable tanks.”		
UK E	5.3.6.1 2 <sup>nd</sup> Para	EN 14025 is referenced as if this were the only pressure vessel code permitted for use; this is not the case for UN portable tanks of Chapter 6.7. Other pressure vessel codes are normally specified as acceptable for use by the competent authorities of the Contracting States of the RID and ADR.	Amend text to read with a new sentence at the end: “In the case of UN portable tanks, the design code shall be that approved for use by the national competent authority in accordance with 6.7.		
UK F	5.3.6.4 4 <sup>th</sup> Para	The standard does not make it clear that only values of lambda = 1 may be used for gas tanks – see 6.8.3.4.5 of RID and ADR	Amend text to read: “In accordance with RID/ADR 6.8.4.3, only values of lambda = 1 may be used for the construction of tanks intended for the carriage of dangerous goods of Class 2.”		
UK 16 revised	5.3.6.2, 5.3.6.3 and 5.3.6.4	ADR 6.8.2.1.23 requires: $\lambda = 0.8$ : the weld beads shall so far as possible be inspected visually on both faces and shall be subjected to a non-destructive spot check. All weld “Tee” junctions with the total length of weld examined to be not less than 10% of the sum of the length of all longitudinal, circumferential and radial (in the tank ends) welds shall be tested;	Amend text to read: “For tanks of a design using a weld efficiency factor $\lambda$ of 0.8 the weld beads shall so far as possible be inspected visually on both faces and be subjected to a non-destructive spot check. All weld “TEE” junctions shall be tested to not less than 10% of the longitudinal, circumferential and radial (e.g. in the tank ends)		

		<p><math>\lambda = 0.9</math>: all longitudinal beads throughout their length, all connections, 25% of circular beads, and welds for the assembly of large-diameter items of equipment shall be subjected to non-destructive checks. Beads shall be checked visually on both sides as far as possible..</p>	<p>Amend text to read: “ For tanks of a design using a weld efficiency factor <math>\lambda = 0.9</math>: all longitudinal beads throughout their length, all connections, 25% of circular beads, and welds for the assembly of large-diameter items of equipment shall be subjected to non-destructive checks. Beads shall be checked visually on both sides as far as possible</p>		
		<p><math>\lambda = 1</math>: all beads shall be subjected to non-destructive checks and shall so far as possible be inspected visually on both sides. A weld test-piece shall be taken</p>	<p>Amend text to read: “For tanks of a design pressure using a weld efficiency factor of <math>\lambda = 1.0</math> all beads shall be subjected to non-destructive checks and shall so far as possible be visually inspected on both sides. A weld test-piece shall be taken.</p>		
UK 17 revised	5.4	6.10.3.6 Vacuum Operated Waste tanks May include an internal piston discharge facility; requires inspection	New 5.4.3.2 clause: to read: Vacuum operated waste tanks with pneumatic operated pistons shall be inspected at initial, periodic and intermediate periodic inspections. The pneumatic operated piston shall not exceed 100 kPa (1 bar)		
UK 18 revised	5.4	6.10.3.5 Vacuum Operated Waste tanks May include openable ends and securing attachments; requires inspection	Omission; add new 5.4.3.1 clause to read: Vacuum operated waste tanks with openable ends and securing attachments shall be inspected at initial, periodic and intermediate periodic		

			inspections. Checks shall include that the ends are leak-tight when closed, that unintended operating shall not be possible, remain securely closed in the event of a power failure, cannot be opened if there is residual over pressure in the tank and that the openable ends cannot be forced open in the event of a roll-over accident.		
UK 19 revised	5.4	6.10.3.7 Vacuum Operated Waste tanks May include a suction boom; requires inspection	Omission; add new 5.4.4 clause: Vacuum operated waste tanks with suction booms shall be inspected at initial, periodic and intermediate periodic inspections.		
UK 20 revised	5.4	6.10.3.8 (f) Vacuum Operated Waste tanks May include sight glasses and isolation valves; requires inspection.	Add a new 5.4.5 clause: “The site glasses shall be inspected at initial, periodic and intermediate periodic inspections.”		
UK G	5.4	6.10.4 Vacuum Operated Waste tanks are to be to subject to an examination of the internal condition at least every two and a half years for tank-containers and tank swap bodies, in addition to the tests according to 6.8.2.4.3	Omission; add new 5.4.4 clause: The internal condition of vacuum operated tanks shall be examined every three years. The internal condition of vacuum operated tank-containers and tank swap-bodies shall be inspected every two and a half years.		
UK 21	5.5.4	ADR 6.8.2.1.27 does not specify a maximum continuity level, however EN12972:2007 required “... shall not exceed 10 Ω”	Requirement of “... shall not exceed 10 Ω” to be reinstated		

UK H	5.5.4	Makes no mention of ensuring for fixed tanks to be inspected to ensure that the earthing point symbol mentioned at 6.8.2.1.27 for <i>fixed tanks</i> is present (symbol not required for other kinds of tank).	Omission; add new 5.4.6 clause to read: The electrical connection between the tank shell and the chassis of fixed tanks and demountable tanks intended for the carriage of liquids having a flashpoint temperature of not more than 60°C or for the carriage of flammable gases or the carriage of UN No. 1361 shall be inspected. The presence of the earth fitting shall be inspected including the presence of the earthing point symbol.		
UK 22 revised	5.6.1 1st Para	To avoid risk of freezing, the temperature of the water during the test should be not less than 7 °C EN12493+A1:2014 – Annex K.3	Amend text of the first paragraph in 5.6.1 to read: “...conditions. To avoid risk of freezing, the temperature of the water during the test should be not less than 7 °C.”		
UK 23 revised	5.6.2	6.7.2.19.3 For Portable Tanks Class 1 and Class 3 to 9, 6.3.7.15.3 Non-refrigerated Liquefied Gases, 6.7.4.14.3 Refrigerated Liquefied Gases, <b>Initial hydraulic test:</b> when the tank and its fittings have been tested separately; they shall be subject, together, to Leakproofness test after assembly see EN12252:2014 – 10.3.1	Omission; add new text only if the standard is to be used as a guideline for the inspection of portable tanks: “ 5.6.2.1 At the initial hydraulic test for UN portable tanks intended for the carriage of substances of Class 1 and Classes 3 to 9 when the tank and its fittings have been tested separately, they shall be subject to a leakproofness test after assembly.”  Add: “ 5.6.2.2 At the initial hydraulic test for UN portable tanks intended for the carriage		

			<p>of non-refrigerated liquefied gases when the tank and its fittings have been tested separately, they shall be subject to a leakproofness test after assembly.”</p> <p>Add: “ 5.6.2.3 At the initial hydraulic test for UN portable tanks intended for the carriage of deeply refrigerated liquefied gasses non-refrigerated gases when the tank and its fittings have been tested separately, they shall be subject to a leakproofness test after assembly.”</p>		
UK 24 revised	5.6.1 4 <sup>th</sup> Para	<p>States “<i>In accordance with the relevant regulation of the transport of dangerous goods the hydraulic pressure test of tanks intended for the carriage of powdery or granular substances may be omitted...</i>”.</p> <p>This is a reference to the last paragraph of 6.8.2.4.2 of RID and ADR. There is no exactly parallel text of this kind in Chapter 6.7 of RID and ADR. The nearest for UN portable tanks can be found at 6.7.2.19.3 of Chapter 6.7 of RID and ADR is that the “hydraulic pressure test may be replaced by a suitable pressure test at 1.5 times the MAWP <i>subject to competent authority approval</i>”.</p> <p>The standard as it is currently drafted might be incorrectly applied to 6.7.2 tanks.</p> <p>6.7.2.19.4 For Portable Tanks Class 1 and Class 3 to 9 the Periodic hydraulic test (for solid, non-toxic or corrosive substances that do not liquefy during carriage) may be replaced by a pressure test at 1.5 times</p>	<p>Omission; add new text if the standard is to be a set of guidelines for UN portable tanks: “For UN portable tanks intended for the carriage of powdery or granular substances which do not liquefy during carriage, the hydraulic pressure test may be replaced with a suitable pressure test at 1.5 times the maximum allowable working pressure <i>subject to the approval of the competent authority</i>.”</p>		

		MAWP			
UK 25 revised	5.6.2	6.7.2.19.4 For Portable Tanks Class 1 and Class 3 to 9 (liquid) And 6.7.3.15.4 Non-Refrigerated Liquefied Gases, <b>Periodic hydraulic test:</b> when the tank and its fittings have been tested separately; they shall be subject, together, to Leakproofness test after re-assembly see EN12252:2014 – 10.3.1	Omission; add new text only if the standard is to be used as a guideline for the inspection of portable tanks: “ 5.6.2.w At the periodic hydraulic test for UN portable tanks intended for the carriage of substances of Class 1 and Classes 3 to 9 when the tank and its fittings have been tested separately, they shall be subject to a leakproofness test after assembly.”  Add: “ 5.6.2.x At the periodic hydraulic test for UN portable tanks intended for the carriage of non-refrigerated liquefied gases when the tank and its fittings have been tested separately, they shall be subject to a leakproofness test after assembly.”  Add: “ 5.6.2.y At the periodic hydraulic test for UN portable tanks intended for the carriage of deeply refrigerated liquefied gasses non-refrigerated gases when the tank and its fittings have been tested separately, they shall be subject to a leakproofness test after assembly.”		
UK 26 revised	5.6.2	6.7.4.14.4 For Refrigerated Liquefied Gases the Periodic hydraulic test, shall be replaced by a Leakproofness test and vacuum reading	Consideration should be given to the requirements of EN13530-2 in respect of 6.7.4		

		see EN13530-2:2002 - 6.5.1.	tanks		
UK 27 revised	5.6	<p>ADR 6.8.3.4.7: In the case of vacuum-insulated tanks, the hydraulic-pressure test and the check of the internal condition may, with the consent of the approved expert, be replaced by a leakproofness test and measurement of the vacuum</p> <p>The substitution of a Leakproofness test for Powder / Granular tanks is detailed in 5.6.1; for consistency this option for LPG tanks should also be detailed</p>	<p>Omission; add new text at the end of 5.6.1: “In the case of vacuum insulated tanks, the hydraulic pressure test and check of the internal condition may, with the consent of the approved expert be replaced by a leakproofness test and measurement of the vacuum.”</p> <p>At the end of 5.6.1 add a further new text: “For fixed tanks (tank-vehicles) and demountable tanks used exclusively for the carriage of LPG with carbon steel shells and service equipment, the hydraulic test pressure may, at the time of periodic inspection and at the request of the applicant be replaced by non-destructive testing (NDT) techniques listed in RID/ADR tank special provision TT11.</p>		

UK 28	5.6.2, 3 <sup>rd</sup> paragraph	<p>The definition of ‘Service Equipment’ in ADR 1.2 does not include pump and/or flow meters including gas extractor. For tanks, it states</p> <p><i>“Of the tank means filling and discharge, breather, safety heating, heat insulating and additive devices and measuring instruments;”</i></p> <p>Therefore Pump / Metering systems are: outside the scope of the definition of ‘Service Equipment’ of ADR Chapter 1.2;</p> <p>In addition:</p> <ul style="list-style-type: none"> <li>- there are no EN Standards for such equipment;</li> <li>- there a no defined test requirements detailed in the Draft FprEN 12972;</li> <li>- there are no test procedures in the draft</li> <li>- the test pressure is related to the test pressure of the tank.. Pressure developed by pumps or external sources is not considered.</li> <li>- specially for low pressure tanks with complex piping systems the costs for evacuation water is costly while there are no benefits for safety when testing 5mm thick piping at 0.4 bar.</li> <li>- pumps and metering devices are included but the connection pipework is not, this will means complete disassembly and separate testing. This will have consequences for reliability and safety. This provision is contra-effective.</li> <li>- vapour recovery and air pressurisation lines can also be seen as service equipment. Filling these with water for testing and drying after testing is costly and there is no additional benefit for safety. The design pressure for air pressure lines can be lower than the test pressure for the tank itself.</li> </ul>	<p>This section requires removal and to revert back to the original statements in EN 12972 : 2007 and N0308 Draft version</p> <p><i>“All service equipment and the whole piping system with the exception of breather devices, safety valves and bursting discs shall be included in the hydraulic pressure test.”</i></p> <p>Delete the 3rd paragraph of sub-clause 5.6.2</p>		
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UK 29	5.6.3.2	<p>Contradicts ADR 6.8.2.4.1 (para 5) and EN 13094:2008 6.5.2</p> <p><i>The test shall be carried out on each compartment at a pressure at least equal to 1.3 times the maximum working pressure</i></p> <p><i>Except for tanks for inter-modal tanks, compartments of compartmented tanks shall be designed to withstand a test pressure which subjects all parts of a compartment to a pressure at least equal to 1,3 x (P<sub>15</sub> + the liquid head of the most dense substance to be carried)</i></p> <p><i>The test pressure shall be related to the highest point of the compartment.</i></p>	Revert to EN 12972:2007 text		
UK I	5.6.3.2.2	<p>The requirements set out for the minimum pressure for the hydraulic pressure test requirements for Chapter 6.8 liquids and solids as set out in the table in 6.8.2.4.1. The rule as stated in 5.6.3.2.2 for the hydraulic test pressure of 1.3 times the maximum working pressure is not what is stated in RID / ADR tanks subject to the provisions of Chapter 6.8.</p> <p>For UN portable tanks intended for the transport of liquids, the required ratio between the test pressure and the design pressure is 1.5.</p>	<p>The paragraph should include either a reference to the table in 6.8.2.4.1 of RID and ADR or repeat the table.</p> <p>If the standard is to remain as guidelines for UN portable tanks, add the following text:  “For UN portable tanks, the test pressure shall be 1.5 times the design pressure.”</p>		

UK J	5.6.3.2.2	<p>The requirements set out are even more divergent from the RID / ADR for the hydraulic test pressure of tanks intended for the carriage of substances of Class 2 (gases). The provisions of Chapter 4.3 of RID and ADR have to be applied for determining the pressure at which the hydraulic test shall be carried out.</p> <p>For UN portable tanks intended for the transport of liquefied gases, the required ratio is between the <i>design</i> pressure and the test pressure, not between the mawp and the test pressure.</p> <p>For UN portable tanks intended for the transport of deeply refrigerated liquefied gases the required ratio is between the mawp + 1 bar.</p> <p>(There is actually an inconsistency in Chapter 6.7 between 6.7.2.19.4 and the definition of design pressure in 6.7.2.1, I think. It is 6.7.2.19.4 which I think is wrong but in the context of these pressure vessel tanks the difference is hardly important at 0.35 bar.)</p>	<p>The paragraph should include either a reference to 4.3.2.2.1 to 4.3.3.2.4 together with the table in 4.3.3.2.5 of Chapter 4.3 of RID and ADR</p> <p>If the standard is to be used as guidelines for UN portable tanks, add the following new text: For UN portable tanks intended for the transport of pressure liquefied gases, the hydraulic pressure test shall be carried out at 1.3 times the <i>design</i> pressure.”</p> <p>If the standard is to be used as guidelines for UN portable tanks, add the following new text: For UN portable tanks intended for the transport of deeply refrigerated liquefied gases, the hydraulic pressure test shall be carried out at 1.3 times the maximum allowable working pressure and 100 kPa (1 bar).”</p>		
UK K	5.6.3.3	<p>For UN portable tanks there is a requirement that heating systems shall be designed so that the pressure inside the shell shall not exceed its Maximum Allowable Working Pressure (MAWP).</p> <p>The implication of the draft is that the MAWP of the tank shell is the determining factor as to at what pressure the steam coils on UN portable tanks should be tested; this is not the case for 6.7.2 tanks.</p>	<p>Amend text to read if the standard is to be used as guidelines for UN portable tanks: “For UN portable tanks, the heating system shall be tested at the pressure for which it was designed so as to ensure the substance(s) transported cannot reach a temperature at which the pressure inside the tank exceeds the maximum</p>		

			allowable working pressure.”		
UK 30 revised	5.6.4	<p>6.7.3.15.3 For Non-Refrigerated Liquefied Gases 6.8.3.4.7 Class 2 Tanks the Initial hydraulic test “... <i>may be replaced .. by using another liquid or gas ...</i> “</p> <p>For LPG vessels, if alternative gases are used for the test medium, consideration should be given to their lower explosive limit and upper explosive limit rather than flashpoint.</p> <p>If the LEL is 13% in air or less it counts as a flammable gas. If the LEL is &gt; 13% then it counts as a flammable gas if the explosive range is more than 12% - see 2.2.2.1.5 flammable gases (a) and (b).</p>	<p>Omission; add new sub-clause and text: “In the case of vacuum-insulated tanks, the hydraulic pressure test and the check of the internal condition may, with the consent of the approved expert, be replaced by a leakproofness test and measurement of the vacuum.”</p> <p>If the standard is to be used as guidelines for UN portable tanks, add “The hydraulic pressure test for UN portable tanks intended for the transport of pressure liquefied gases may be replaced by another liquid or gas with the agreement of the competent authority.”</p> <p>If the standard is to be used as guidelines for UN portable tanks, add “The hydraulic pressure test may be replaced by a suitable pressure test at 1.5 times the maximum allowable working pressure, subject to competent authority approval.”</p>		
UK 31 revised	5.6	<p>For LPG road tanks see EN12252:2014 – 10.2.1</p> <p><i>On completion of construction, road tanker pipework shall be subjected to a hydraulic pressure test at a test pressure of 1,3 times the design pressure specified in the pipework design document or 1,3</i></p>	<p>Add new sub-clause and text: On completion of construction, fixed tanks (tank-vehicles) intended for the carriage of LPG, the pipework shall be subjected to a hydraulic pressure test at a test pressure</p>		

		<i>times the test pressure of the pressure vessel, whichever is the greatest.</i>	of 1,3 times the design pressure specified in the pipework design document or 1,3 times the test pressure of the pressure vessel, whichever is the greatest.”		
UK 32	5.6.4	The test as specified in the standard seems to be more extensive than necessary. The tests are more applicable for static tanks that are designed with a much smaller safety margin than tanks for transport of dangerous goods. As a result the costs for performing these test are unnecessary high.	Redraft 5.6.4 completely taking into account the risks of failure of a transport tank.		
UK 33	5.6.4, 3 <sup>rd</sup> paragraph plus indents	Limitations are specified for test fluids which do not exist in ADR and in effect it will be completely meaningless because 1.1.5 (ADR) clearly states that where there is a conflict between a standard and RID the latter takes precedence. The use of water for testing aircraft refuelling tankers could lead to fuel contamination.	Delete sub clause 5.6.4 Test fluid		
UK 34	5.6.4, 3 <sup>rd</sup> paragraph plus indents	Extensive changes that are flawed, increase burdens and reduce effectiveness have been made to the hydraulic pressure test without justification, and include new restrictions on the use of gas that are contrary to the provisions in RID / ADR.			
UK 35	5.6.4, 3 <sup>rd</sup> paragraph plus indents	ADR 6.8.2.4.1 and 6.8.2.4.2 Note <sup>10</sup> Allows “ <i>In special cases and with the agreement of the expert approved by the competent authority, the hydraulic pressure test may be replaced by a pressure test using another liquid or gas, where such an operation does not present any danger</i> ” The new proposed sub-clause is to ensure that	New Sub-clause; change text: <b>5.6.4.1 General</b> The fluid normally used for hydraulic pressure testing shall be water. Other liquids may be used with		

		<p>the Competent Authority has approved the expert for the use of other liquids (including gases) and that an individual expert cannot make the determination to use alternative liquids or gas without completing the approval process</p>	<p>agreement of the expert only in special cases by an inspection body whose methods and procedures have been evaluated and approved by an independent expert appointed by the Competent Authority. The Inspection Body may only use these special case methods after receiving authorisation for their use from the Competent Authority, and with agreement of the expert.</p> <p>New sub-clause; change text:  <b>5.6.4.2 Special Cases for the use of Alternative Liquids</b>  Alternative Liquids, including gases, may be used for pressure testing only in special cases by inspection bodies that have been authorised for the use of their methods and procedures by the Competent Authority and with agreement of the expert (see 5.6.4.1).</p>		
UK 36	5.6.5.1	<p>We are not convinced that the advice given is correct to ensure safe working and could lead readers to believe that by following these requirements they were operating an appropriate system of work when they were not.</p>	<p>Restrict this normative text to warning of the dangers and the need for a thorough risk assessment. Move the advice to an informative annex and improve the advice as appropriate. The need to respect any national regulations should also be mentioned.</p>		

UK L	5.6.5.1	<p>Whilst it can be accepted that a safety distance is good practice, the existing calculation cannot be applied to UN portable tanks on the territory of a nation State which is not a contracting party to the RID or ADR. There may be, for example, national rules which have an alternative method of determining the safe distance from UN portable tanks when being tested with gas as the test fluid.</p>	<p>Restrict this normative text to warning of the dangers and the need for a thorough risk assessment. Move the advice to an informative annex and improve the advice as appropriate. The need to respect any national regulations should also be mentioned.</p>		
UK37	5.6.5.2 2 <sup>nd</sup> indent	<p>The level of radiography included in this proposal represents an increase of 500% above that required when the vessel was originally manufactured.</p> <p>Additional radiography should only be a requirement if the internal and external visual inspection identifies defects. If during the internal and external inspections the appraisals raise concerns regarding the condition of the tank, then the hydraulic test will not be carried out until these concerns have been investigated and addressed.</p> <p>If repairs are required, the inspection would then revert to an Exceptional Inspection (4.6.1 / 4.6.3 / 4.6.4) which already includes: - <i>check of the design characteristics (see 5.3)</i></p> <p>When testing with a gas, additional provisions apply which is so strict that the can hardly be used on any tank.</p> <ul style="list-style-type: none"> <li>- “any part hiding a possible defect” means even if the slightest corrosion or scratch can be expected the whole shell shall be uncovered including structural equipment and coupler plate of a semi-trailer, effectively destroying the tank.</li> <li>- if a tank is designed around a weld efficiency factor of 0.8 first more NDT needs to be performed. Testing with gas in</li> </ul>	<p>Reword 2<sup>nd</sup> indent</p> <ul style="list-style-type: none"> <li>- additional non-destructive testing shall be carried out in accordance with 5.3.6 only if surface defects are identified or the tank shows indications of a reduction of the wall thickness. If additional non-destructive testing is required it shall be carried out at least to the amount of the weld efficiency factor used for the manufacture of the tank but not less than 0,8 and testing with alternative liquids or gas is not permitted.</li> </ul>		

		<p>situations where cleaning is difficult film cannot be attached to the inside.</p> <p>- “Any bolts or studs with worn or damaged treads shall be replaced” means that you have to unbolt any connection to check if treads are damaged leading to unnecessary costs and reliability problems.</p>	Delete sub clause 5.6.5.2		
UK M	5.6.5.2 2 <sup>nd</sup> indent	The requirements concerning additional non-destructive testing cannot be applied to UN portable tanks where the lambda weld efficiency factor formulae cannot be used in determining minimum shell thickness.	Amend text if not deleted totally for other reasons to read if the standard is to be used as guidelines for UN portable tanks: “Note: Weld efficiency factors are not applicable to the design and construction of UN portable tanks.”		
UK N	5.6.7	<p>The minimum durations of the hydraulic pressure test are given. Whilst this is good practice, it is possible that competent authorities authorising the testing conditions for 6.7.2 UN portable tanks outside the RID and ADR territorial areas.</p> <p>The draft standard appears to take this authority away from such competent authorities were it to be applied to the testing of UN portable tanks</p>	The need to respect any national regulations should also be mentioned if the standard is to be used as guidelines for UN portable tanks so add: “For UN portable tanks national competent authorities or their authorised bodies may determine other duration periods.”		
UK O	5.6.8	<p>Requires the accuracy of the equipment for measuring test pressures are required to be in accordance with EN 837-1 or -3. This standard is not necessarily recognised by competent authorities outside the RID and ADR territorial areas who may, in any case, have their own regional or national standards to which they wish to refer for the pressure testing of UN portable tanks.</p> <p>The draft standard appears to take this authority away from such competent</p>	The need to respect any national regulations should also be mentioned if the standard is to be used as guidelines for UN portable tanks so add: “For UN portable tanks national competent authorities or their authorised bodies may apply other criteria for determining the accuracy of measuring equipment.”		

		authorities were it to be applied to the testing of UN portable tanks.			
UK 38	5.7	6.7.4.14.4 For Refrigerated Liquefied Gases And 6.8.3.4.7 Class 2 Tanks The method of performing a vacuum reading on vacuum insulated tanks requires detailing.	Add new text details the procedure for drawing down the vacuum between the inner and outer vessels to near perfect vacuum		
UK 39 revised	5.7.1	An optional test pressure that may not be appropriate has been introduced for vacuum testing without justification	New text required for each type of tank (6.7 / 6.8 / 6.10) to which this is applicable		
UK P	5.7.1	The standard states that a (negative) pressure 1.5 times the more severe than the external design pressure shall be created and held for a minimum of 5 minutes. Whilst this may be good practice, the way in which vacuum testing for tank shells with a less than a 1.0 bar external design pressure should be carried out has to be firstly determined by any requirements for this kind of testing given in the approved pressure vessel code and then for UN portable tanks tested outside of the territory of the RID and ADR in any other suitable way if not specified in the pressure vessel code determined by the appropriate competent authority	The need to respect any national regulations should also be mentioned if the standard is to be used as guidelines for UN portable tanks so add: “For UN portable tanks national competent authorities or their authorised bodies may apply other criteria for performing vacuum testing.”		
UK Q	5.7.2	Requires the accuracy of the equipment for measuring vacuum testing are required to be in accordance with EN 837-1 or -3. This standard is not necessarily recognised by competent authorities outside the RID and ADR territorial areas that may, in any case, have their own regional or national standards to which they wish to refer for the pressure testing of UN portable tanks.  The draft standard appears to take this authority away from such competent	The need to respect any national regulations should also be mentioned if the standard is to be used as guidelines for UN portable tanks so add: “For UN portable tanks national competent authorities or their authorised bodies may apply other criteria for determining the accuracy of measuring equipment.”		

		authorities were it to be applied to the testing of UN portable tanks.			
UK R	5.8.3	The table concerning the test pressure for the leakproofness test is not consistent with the way this test must be carried out for UN portable tanks. It would not be permissible for UN portable tanks intended for the transport of liquids and solids to use a test pressure of 0.2 bar – see definition of leakproofness test in Chapter 6.7 which overrides the definition of leakproofness test given in Chapter 1.2 of the RID and ADR	Omission; add new text if the standard is to be used as guidelines for the testing of UN portable tanks: “For UN portable tanks intended for the transport of substances of Classes 1 and 3 to 9 and pressure liquefied gases of Class 2 the leakproofness test shall be carried out at a pressure not less than 25% of the maximum allowable working pressure.  For UN portable tanks intended for the transport of deeply refrigerated liquefied gases the leakproofness test shall be carried out at pressure not less than 90 of the maximum allowable working pressure.		
UK S	5.8.3 Table 2	There are minimum requirements for carrying out the leakproofness test on UN portable tanks. The table is not in accordance with these provisions.	New line required for 6.7.2 Portable Tanks if the standard is to be used as guidelines for UN portable tanks to read: “The test pressure for the leakproofness test for UN portable tanks intended for the transport of dangerous goods of Classes 1 and 3 to 9 and pressure liquefied gases of Class 2 shall be carried out using a gas subjecting the shell and its service equipment to an effective internal pressure of not less than 25% of the		

							maximum allowable working pressure. The test pressure for the leakproofness test for UN portable tanks intended for the transport deeply refrigerated liquefied gases of Class 2 shall be carried out using a gas subjecting the shell and its service equipment to an effective internal pressure of not less than 90% of the maximum allowable working pressure. Table 2 shall be disregarded for UN portable tanks”		
UK 40	5.8.3 Table 2	Test pressures for Leakproofness Test							
		Line	Standard	ADR	Gas	Liq'd			
		1	13094 / 14025	6.8 / 6.10	X	✓			
		2	13094 / 14025	6.8 / 6.10	✓	X			
		3	Class 2 LPG	6.7	✓	✓			
		4	Class 2 Cryo	6.7	✓	X			
		5	Class 2 Cryo	6.7 / 6.8.3	✓	✓			
	Line 4	6.7.2.1 Class 1 and Class 3 to 9 - Portable Tanks; means a Leakproofness test using gas Correct (if MEGCs are not within scope)					See above comment		
	Line 4	6.7.3.1 Non-Refrigerated Gases - Portable Tanks:					See above comment		

		means a Leakproofness test using gas 6.7.3.15.3 allows the use of a Liquid for initial hydraulic test but 6.7.3.15.4 Periodic does not? One of these lines (4 or 5) requires amending to be consistent with the other (see below)	Not consistent with Line 5 below		
	Line 5	6.7.4.1 Refrigerated Gases - Portable Tanks: means a Leakproofness test using gas 6.7.4.14.3 allows the use of a Liquid for initial hydraulic test but 6.7.4.14.4 Periodic does not? One of these lines (4 or 5) requires amending to be consistent with the other; if Line 5 is changed to NO Liquids, then another Line will have to be added as 6.8.3 tank Leakproof fluids are not specified If a Vacuum Insulated tank, a Vacuum reading is required (see No 38 - 5.7 above)	See above comment  Not consistent with Line 4 above  Omission; add new text		
UK 41 revised	5.8	Cryogenic Vessels – Vacuum Insulated: EN13530-2: 2002 - 6.1.2 leakproofness tests by ensuring the integrity of vacuum, and leak testing of external piping when it is connected to the inner vessel.	Consideration should be given to the requirements of EN13530-2 in respect of Cryogenic tanks  This standard can only be used as a guideline for vacuum insulated UN portable tanks.		
UK 42 revised	5.8	Cryogenic Vessels – Vacuum Insulated: EN13530-2: 2002 - 6.1.2 leak test of external piping. .	Consideration should be given to the requirements of EN13530-2 in respect of Cryogenic tanks  This standard can only be used as a guideline for vacuum insulated UN portable tanks.		

UK 43 revised	5.8	ADR 6.8.2.4.2 3 <sup>rd</sup> Para: In the case of tanks intended for the carriage of powdery or granular substances, and with the agreement of the expert approved by the competent authority, the periodic hydraulic pressure tests may be omitted and replaced by leakproofness tests in accordance with 6.8.2.4.3, at an effective internal pressure at least equal to the maximum working pressure If Powder / Granular tanks are 'hydraulically' tested to Table 2 they will be tested at less than MWP	Include a new sub-clause specifying substituted Leakproofness tests in lieu of hydraulic to read: "For tanks intended for the carriage for the carriage of liquids or solids in the granular or powdery state, when a gas is used for the leakproofness test it shall be carried out at a pressure of at least equal to 25% of the maximum working pressure with a minimum pressure of not less than 0.2 bar gauge pressure. In such cases Table 2 shall be disregarded."		
UK 44 revised	5.8.7.1	ADR 6.8.2.4.3 - 5 <sup>th</sup> para: For tanks equipped with breather devices and a safety device to prevent the contents spilling out if the tank new overturns, the pressure test shall be equal to the static pressure of the filling substance.	Add new indent to read: "For tanks equipped with breather devices and a safety device to prevent the contents spilling out if the tank new overturns, the pressure test shall be equal to the static pressure of the filling substance."		
UK 45 revised	5.8.7.2	6.10.3.9 Vacuum Operated Waste tanks May include Pressure Gauge; requires inspection of service equipment described in 6.10.3.9.	Omission; add new 5.8.7.3 clause: "Vacuum operated waste tanks fitted with pumps/exhauster units shall be inspected."  Add new 5.8.7.4 clause: "The manometer fitted to the pump/exhauster units on vacuum operated waste tanks shall be inspected at initial, periodic and intermediate periodic inspections."		

			<p>Add a new 5.8.7.5 clause: “The level indicating device fitted to vacuum operated waste tanks shall be inspected at initial, periodic and intermediate periodic inspections.</p> <p>Add a new 5.8.7.6 clause: The bursting disc and safety valve fitted to vacuum operated waste tankers shall be inspected at initial, periodic and intermediate periodic inspections</p>		
UK T	after 5.8.7.6	Vacuum-operated waste tanks shall be subjected to an inspection of the internal condition every three years and for waste tank-containers and waste tank swap bodies every 2.5 years	Omission; add new 5.8.7.7 clause: The internal condition of vacuum operated tanks shall be examined every three years. The internal condition of vacuum operated tank-containers and tank swap-bodies shall be inspected every two and a half years.		
UK U	5.8.8	Evaluation of the results of leakproofness test according to EN 12666-1:2012 Rate A – Whilst this may be good practice, the way in which the results of the leakproofness test is evaluated with UN portable tanks tested outside of the territory of the RID and ADR in any other suitable way if not specified in the pressure vessel code determined by the appropriate competent authority.	The need to respect any national regulations should also be mentioned. If the standard is to be used as guidelines for UN portable tanks add: “In the case of UN portable tanks, the national competent authority shall determine how the term “no visually discernible liquid” is to be defined and determined”.		
UK V	5.9	There are specific rules in 6.8.3.4.4 of ADR for the determination of the capacity of tanks intended for the transport of compressed	The draft standard should state specifically when determination by calculation is not permitted		

		gases, liquefied gases and dissolved gases. Determination by calculation is not permitted.	Insofar as the standard is to be used as guidelines for UN portable tanks, add the following text: "For UN portable tanks, determination of the capacity by calculation methods are not permitted. The water capacity at 20°C shall be determined by measurement."		
UK 46 revised	5.10.3	LPG road tanker discharge hose with their couplings shall be tested to a pressure of 1,5 times its design pressure see EN12252:2014 – 8.6.5.	Consideration should be given to the requirements of EN12252:2014 in respect of testing of LPG road tank discharge hose hoses and their couplings		
UK 47 revised	5.10	Cryogenic Vessels – Vacuum Insulated: EN13530-2: 2002 - 4.2.3.11 (a) Piping including valves shall be subjected to a pneumatic pressure test: not less than the allowable working pressure plus 1 bar for piping inside the vacuum jacket	Consideration should be given to the requirements of EN13530-2 in respect of Cryogenic tanks This standard can only be used as a guideline for vacuum insulated UN portable tanks.		
UK 48	5.13.3	Normative provisions for tank plates are incompatible with requirements already set out in ADR / RID (Annex E and Annex F). The paragraph is a contradiction of the content and layout of the data plates set out in Chapter 6.7 of the United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations as adopted into Chapter 6.7 of the RID/ADR/IMDG Code	See UK W comments below		
UK W	5.13.3	Annex F cannot be deemed to be Normative for portable tanks. Annex F should be deleted and replaced with the following for	Amend the second line of the first paragraph to read: "...For the requirements for the		

		first generation portable tanks	marking of IMO portable tanks see Amdt 29 1998 of the IMDG Code. For the requirements for marking the appropriate section of Chapter 6.7 of the United Nations Recommendations – Model Regulations.		
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