Organisation intergouvernementale pour les transports internationaux ferroviaires
Zwischenstaatliche Organisation für den internationalen Eisenbahnverkehr
Intergovernmental Organisation for International Carriage by Rail

OTIF/RID/CE/GTT/2018/1

22 January 2018

Original: German

RID: **15th Session of the RID Committee of Experts' working group on tank and vehicle technology**
(Hamburg, 30/31 January 2018)

Subject: **Comparison of the provisions applicable to tank-wagons and tank-containers**

Information from Germany

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RID	Tank-wagons	Tank-containers
6.8.2.1.2	Tank-wagons shall be constructed as to be capable of withstanding, under the maximum permissible load, the stresses which occur during carriage by rail.[1] As regards these stresses, reference should be made to the tests prescribed by the competent authority. [1] This requirement is deemed to be met if – the notified body in charge of verifying compliance with the technical specification for interoperability (TSI) relating to the subsystem "rolling stock – freight wagons" of the rail system in the European Union (Commission Regulation (EU) No 321/2013 of 13 March 2013) or – the assessing entity in charge of verifying compliance with the uniform technical prescriptions (UTP) applicable to the Rolling Stock subsystem: FREIGHT WAGONS – (Ref. A 94-02/2.2012 of 1 January 2014) has successfully evaluated compliance with the provisions of RID, in addition to the requirements of the TSI or UTP mentioned above, and has confirmed this compliance by a relevant certificate. *Notes:* *TSI WAG refers to EN 12663-2 (2010), sections 5-8* ➢ *Proof load case for mounting items of equipment (5.2.4.2)* ➢ *In x-direction: 5 g* ➢ *In y-direction: 1 g* ➢ *In z-direction: 3 g (at the end of the vehicle)* ➢ *Collision impact (8.2.3) loaded at 12 km/h*	Tank-containers and their fastenings shall, under the maximum permissible load be capable of absorbing the forces equal to those exerted by: – in the direction of travel: twice the total mass; – horizontally at right angles to the direction of travel: the total mass; (where the direction of travel is not clearly determined, twice the total mass in each direction); – vertically upwards: the total mass; – vertically downwards: twice the total mass. *Notes:* *Tank-containers (UIC 592):* • *Max. permissible total mass = 36 t* • *Dynamic longitudinal stress test: 2 g* • *Lateral inertial forces: 1 g* *Carrying wagon:* • *TSI WAG refers to EN 12663-2 (2010), sections 5-8* ➢ *Proof load case for mounting items of equipment (5.2.4.2) → without tank-container* o *In x-direction: 5 g* o *In y-direction: 1 g* o *In z-direction: 3 g (at the end of the vehicle)* ➢ *Collision impact (8.2.3) loaded at 12 km/h → with tank-container* • *For UIC unified wagons according to UIC 571-4, the following are laid down (not prescribed according to TSI WAG):* o *Design, production measurements, material properties of the fixing pins* o *Arrangement of fixing pins* o *Carrying wagon design types*
6.8.2.1.13	The pressure on which the shell thickness is based shall not be less than the calculation pressure, but the stresses referred to in 6.8.2.1.1 shall also be taken into account, and, if necessary, the following stresses:	
	In the case of wagons in which the tank constitutes a stressed self-supporting member, the shell shall be designed to withstand the	Under each of these stresses the safety factors to be observed shall be the following:

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	stresses thus imposed in addition to stresses from other sources.	– for metals having a clearly-defined yield point: a safety factor of 1.5 in relation to the apparent yield strength; or – for metals with no clearly-defined yield point: a safety factor of 1.5 in relation to the guaranteed 0.2% proof strength (1% maximum elongation for austenitic steels).
6.8.2.1.18	Shells shall be not less than 6 mm thick if of mild steel[3], or of equivalent thickness if of another metal. For powdery or granular substances, this thickness may be reduced to 5 mm for mild steel or to an equivalent thickness for other metals. Whichever metal is used, the minimum wall thickness of the shell shall in no case be less than 4.5 mm.	Shells shall be not less than 5 mm thick if of mild steel[3] (in conformity with the requirements of 6.8.2.1.11 and 6.8.2.1.12) or of equivalent thickness if of another metal. Where the diameter is more than 1.80 m[4], this thickness shall be increased to 6 mm except in the case of tanks intended for the carriage of powdery or granular substances, if the shell is of mild steel[3] or to an equivalent thickness if of another metal. Whatever the metal used, the shell thickness shall in no case be less than 3 mm.
	"Equivalent thickness" means the thickness obtained by the following formula[5]: $$e_1 = \frac{464\, e_0}{\sqrt[3]{(Rm_1 A_1)^2}}$$ [3] For the definitions of "mild steel" and "reference steel" see 1.2.1. "Mild steel" in this case also covers a steel referred to in EN material standards as "mild steel", with a minimum tensile strength between 360 N/mm^2 and 490 N/mm^2 and a minimum elongation at fracture conforming to 6.8.2.1.12. [4] […] [5] […]	
6.8.2.1.19	(Reserved)	Where protection of the tank against damage is provided according to 6.8.2.1.20, the competent authority may allow the aforesaid minimum thicknesses to be reduced in proportion to the protection provided; however, the said thicknesses shall be not less than 3 mm in the case of mild steel[3], or than an equivalent thickness in the case of other materials, for shells not more than 1.80 m[4] in diameter. For shells of a diameter exceeding 1.80 m[4] this minimum thickness shall be increased to 4 mm in the case of mild steel[3], and to an equivalent thickness in the

<table>
<tr><th>RID</th><th>Tank-wagons</th><th>Tank-containers</th></tr>
<tr><td></td><td></td><td>case of other metals.

Equivalent thickness means the thickness given by the formula in 6.8.2.1.18.

The thickness of shells with protection against damage in accordance with 6.8.2.1.20 shall not be less than the values given in the table below:

<table>
<tr><td></td><td>Diameter of shell</td><td>≤ 1.80 m</td><td>> 1.80 m</td></tr>
<tr><td rowspan="5">Minimum thickness of shells</td><td>Austenitic stainless steels</td><td>2.5 mm</td><td>3 mm</td></tr>
<tr><td>Austenitic-ferritic stainless steels</td><td>3 mm</td><td>3.5 mm</td></tr>
<tr><td>Other steels</td><td>3 mm</td><td>4 mm</td></tr>
<tr><td>Aluminium alloys</td><td>4 mm</td><td>5 mm</td></tr>
<tr><td>Pure aluminium of 99.80%</td><td>6 mm</td><td>8 mm</td></tr>
</table>
</td></tr>
<tr><td>6.8.2.1.20</td><td>(Reserved)</td><td>The protection referred to in 6.8.2.1.19 may consist of:

– overall external structural protection as in "sandwich" construction where the sheathing is secured to the shell; or
– a structure in which the shell is supported by a complete skeleton including longitudinal and transverse structural members; or
– double-wall construction.

Where the tanks are made with double walls, the space between being evacuated of air, the aggregate thickness of the outer metal wall and the shell wall shall correspond to the minimum wall thickness prescribed in 6.8.2.1.18, the thickness of the wall of the shell itself being not less than the minimum thickness prescribed in 6.8.2.1.19.

Where tanks are made with double walls with an intermediate layer of solid materials at least 50 mm thick, the outer wall shall have a thickness of not less than 0.5 mm if it is made of mild steel[3] or at least 2 mm if it is made of a plastics material reinforced with glass fibre. Solid foam with an impact absorption capacity such as that, for example, of polyurethane foam, may be used as the intermediate layer of solid material.</td></tr>
</table>

RID	Tank-wagons	Tank-containers
6.8.2.1.29	The minimum distance between the headstock plane and the most protruding point at the shell extremity on tank-wagons shall be 300 mm. Alternatively for tank-wagons for substances other than those for which the requirements of special provision TE 25 of 6.8.4 (b) apply, buffer override protection of a design approved by the competent authority shall be provided. This alternative is only applicable to tank-wagons used solely on railway infrastructure requiring a freight vehicle gauge smaller than G1[6]. [6] […]	(Reserved)
6.8.2.2.1	Suitable non-metallic materials may be used to manufacture service and structural equipment.	
	To prevent tearing of the shell due to accidental stresses, welded elements shall be fixed to the tank as follows: – Underframe connection: securing by means of a pad ensuring distribution of dynamic loads; – Supports for upper gangway, access ladder, drainage pipes, valve control mechanisms and other load transmission brackets: securing by means of weld-on reinforcement plate; – Appropriate dimensioning or other protective measures (e.g. designated breaking point).	
	The items of equipment shall be so arranged as to be protected against the risk of being wrenched off or damaged during carriage or handling. They shall exhibit a suitable degree of safety comparable to that of the shells themselves, and shall in particular: – be compatible with the substances carried; and – meet the requirements of 6.8.2.1.1. Piping shall be designed, constructed and installed so as to avoid the risk of damage due to thermal expansion and contraction, mechanical shock and vibration. The leakproofness of the service equipment shall be ensured even in the event of the overturning of the tank-wagon or tank-container. The gaskets shall be made of a material compatible with the substance carried and shall be replaced as soon as their effectiveness is impaired,	

RID	Tank-wagons	Tank-containers
	for example as a result of ageing. Gaskets ensuring the leakproofness of fittings requiring manipulation during normal use of tanks shall be so designed and arranged that manipulation of the fittings incorporating them does not damage them.	
6.8.2.2.2	Each bottom-filling or bottom-discharge opening in tanks which are referred to, in Column (12) of Table A of Chapter 3.2, with a tank code including the letter "A" in its third part (see 4.3.4.1.1) shall be equipped with at least two mutually independent closures, mounted in series, comprising – an external stop-valve with piping made of a malleable metal material and – a closing device at the end of each pipe which may be a screw-threaded plug, a blank flange or an equivalent device. This closing device shall be sufficiently tight so that the substance is contained without loss. Measures shall be taken to enable the safe release of pressure in the discharge pipe before the closing device is completely removed. Each bottom-filling or bottom-discharge opening in tanks which are referred to, in Column (12) of Table A of Chapter 3.2, with a tank code including the letter "B" in its third part (see 4.3.3.1.1 or 4.3.4.1.1) shall be equipped with at least three mutually independent closures, mounted in series, comprising – an internal stop-valve, i.e. a stop-valve mounted inside the shell or in a welded flange or companion flange; – an external stop-valve or an equivalent device[7],	
	one at the end of each pipe and	as near as possible to the shell and
	– a closing device at the end of each pipe which may be a screw-threaded plug, a blank flange or an equivalent device. This closing device shall be sufficiently tight so that the substance is contained without loss. Measures shall be taken to enable the safe release of pressure in the discharge pipe before the closing device is completely removed. However, in the case of tanks intended for the carriage of certain crystallizable or highly viscous substances and shells fitted with an ebonite or thermoplastic coating, the internal stop-valve may be replaced by an external stop-valve provided with additional protection. The internal stop-valve shall be operable either from above or from below. Its setting – open or closed – shall so far as possible in each case be capable of being verified from the ground. Internal stop-valve control devices shall be so designed as to prevent any unintended opening through impact or an inadvertent act. The internal shut-off device shall continue to be effective in the event of damage to the external control device. In order to avoid any loss of contents in the event of damage to the external fittings (pipes, lateral shut-off devices), the internal stop-valve and its seating shall be protected against the danger of being wrenched off by external stresses or shall be so designed as to resist them. The filling and discharge devices (including flanges or threaded plugs) and protective caps (if any) shall be capable of being secured against any unintended opening. The position and/or direction of closure of shut-off devices shall be clearly apparent.	

RID	Tank-wagons	Tank-containers
	All openings of tanks which are referred to in Column (12) of Table A of Chapter 3.2, by a tank code including letter "C" or "D" in its third part (see 4.3.3.1.1 and 4.3.4.1.1) shall be situated above the surface level of the liquid. These tanks shall have no pipes or pipe connections below the surface level of the liquid. The cleaning openings (fist-holes) are, however, permitted in the lower part of the shell for tanks referred to by a tank code including letter "C" in its third part. This opening shall be capable of being sealed by a flange so closed as to be leakproof and whose design shall be approved by the competent authority or by a body designated by that authority. [7] In the case of tank-containers of less than 1 m^3 capacity, the external stop-valve or other equivalent device may be replaced by a blank flange.	
6.8.2.2.3	Tanks that are not hermetically closed may be fitted with vacuum valves	
	or with self-operating ventilation valves	
	to avoid an unacceptable negative internal pressure; these valves shall be set to relieve at a vacuum setting not greater than the vacuum pressure for which the tank has been designed (see 6.8.2.1.7). Hermetically closed tanks shall not be fitted with vacuum valves	
	or with self-operating ventilation valves.	
	However, tanks of the tank code SGAH, S4AH or L4BH, fitted with these valves which open at a negative pressure of not less than 21 kPa (0.21 bar) shall be considered as being hermetically closed. For tanks intended for the carriage of solid substances (powdery or granular) of packing group II or III only, which do not liquefy during transport, the negative pressure may be reduced to not less than 5 kPa (0.05 bar).	
	Vacuum valves and self-operating ventilation valves	Vacuum valves
	and breather devices (see 6.8.2.2.6) used on tanks intended for the carriage of substances meeting the flash-point criteria of Class 3, shall prevent the immediate passage of flame into the shell by means of a suitable protective device, or the shell of the tank shall be explosion pressure shock resistant, which means being capable of withstanding without leakage, but allowing deformation, an explosion resulting from the passage of the flame. If the protective device consists of a suitable flame trap or flame arrester, it shall be positioned as close as possible to the shell or the shell compartment. For multi-compartment tanks, each compartment shall be protected separately.	
	For tanks with self-operating ventilation valves, the connection between the self-operating ventilation valve and the bottom valve shall be so arranged that the valves do not open in the event of deformation of the tank or the contents cannot escape in the event of their opening.	
6.8.2.2.4	The shell or each of its compartments shall be provided with an opening large enough to permit inspection.	
	These openings shall be provided with closures designed for a test pressure of at least 0.4 MPa (4 bar). Hinged dome covers for tanks with a test pressure of more than 0.6 MPa (6 bar) shall not be permitted.	

RID	Tank-wagons	Tank-containers
6.8.2.4.2	Shells and their equipment shall undergo periodic inspections no later than every	
	eight years	five years.
	These periodic inspections shall include: – An external and internal examination; – A leakproofness test in accordance with 6.8.2.4.3 of the shell with its equipment and check of the satisfactory operation of all the equipment; – As a general rule, a hydraulic pressure test[11] (for the test pressure for the shells and compartments if applicable, see 6.8.2.4.1). Sheathing for thermal or other insulation shall be removed only to the extent required for reliable appraisal of the characteristics of the shell. 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. [11] 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.	
6.8.2.4.3	Shells and their equipment shall undergo intermediate inspections at least every	
	four years	two and a half years
	after the initial inspection and each periodic inspection. These intermediate inspections may be performed within three months before or after the specified date. However, the intermediate inspection may be performed at any time before the specified date. If an intermediate inspection is performed more than three months before the due date, another intermediate inspection shall be performed at the latest	
	four years	two and a half years
	after this date. These intermediate inspections shall include a leakproofness test of the shell with its equipment and check of the satisfactory operation of all the equipment. For this purpose the tank shall be subjected to an effective internal pressure at least equal to the maximum working pressure. For tanks intended 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 at least equal to 25% of the maximum working pressure. In all cases, it shall not be less than 20 kPa (0.2 bar) (gauge pressure).	

RID	Tank-wagons	Tank-containers
	For tanks equipped with breather devices and a safety device to prevent the contents spilling out if the tank overturns, the leakproofness test shall be carried out at a pressure at least equal to the static pressure of the densest substance to be carried, the static pressure of water or 20 kPa (0.2 bar), whichever is the highest. The leakproofness test shall be carried out separately on each compartment of compartmented shells.	
6.8.2.5.2	The following particulars shall be inscribed on both sides of the tank-wagon (on the tank itself or on plates): – vehicle keeper mark or name of operator[15]; – capacity[14]; – unladen mass of tank-wagon[14]; – load limits according to the characteristics of the wagon and the nature of the lines used; – for the substances according to 4.3.4.1.3, the proper shipping name of the substance(s) accepted for carriage; – tank code according to 4.3.4.1.1; – for substances other than those according to 4.3.4.1.3, the alpha-numeric codes of all special provisions TC and TE which are shown in column (13) of Table A of Chapter 3.2 for the substances to be carried in the tank; and – date (month, year) of the next inspection in accordance with 6.8.2.4.2 and 6.8.2.4.3 or with the TT special provisions of 6.8.4 for the substance(s) accepted for carriage. If the next inspection is an inspection in accordance with 6.8.2.4.3, the date shall be followed by the letter "L".	The following particulars shall be inscribed on the tank-container (on the tank itself or on plates): – names of owner and of operator; – capacity of the shell[14]; – tare[14]; – maximum permissible gross mass[14]; – for the substances according to 4.3.4.1.3, the proper shipping name of the substance(s) accepted for carriage; – tank code according to 4.3.4.1.1; and – for substances other than those according to 4.3.4.1.3, the alpha-numeric codes of all special provisions TC and TE which are shown in column (13) of Table A of Chapter 3.2 for the substances to be carried in the tank.
	[14] Add the units of measurement after the numerical values. [15] […]	
6.8.4 b	<u>TE 16:</u> No part of the tank-wagon may be of wood, unless this is protected by a suitable coating.	(Reserved)
	<u>TE 22:</u> In order to reduce the extent of damage in the event of a collision	(Reserved)

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	shock or accident, each end of tank-wagons for substances carried in the liquid state and gases or battery-wagons shall be capable of absorbing at least 800 kJ of energy by means of elastic or plastic deformation of defined components of the subframe or by means of a similar procedure (e.g. crash elements). The energy absorption shall be determined in relation to a collision on a straight track. Energy absorption by means of plastic deformation shall only occur in conditions other than those encountered during normal conditions of rail transport (impact speed higher than 12 km/h or individual buffer force greater than 1500 kN). Energy absorption of not more than 800 kJ at each end of the wagon shall not lead to transfer of energy to the shell which could cause visible, permanent deformation of the shell. The requirements of this special provision are deemed to be met if crashworthy buffers (energy absorption elements) that conform to clause 7 of standard EN 15551:2009 + A1:2010 (Railway applications – Railway rolling stock – Buffers) are used and if the resistance of the wagon body satisfies clause 6.3 and sub clause 8.2.5.3 of standard EN 12663-2:2010 (Railway applications – Structural requirements of railway vehicle bodies – Part 2: Freight wagons). The requirements of this special provision are deemed to be met by tank-wagons with an automatic coupling device equipped with energy absorption elements capable of absorbing at least 130 kJ at each end of the wagon.	
	TE 25: Shells of tank-wagons shall also be protected against the overriding of buffers and derailment or, failing that, to limit damage when buffers override by at least one of the following measures. Measures to avoid overriding (a) Device to protect against the overriding of buffers	(Reserved)

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	The device to protect against the overriding of buffers shall ensure that the sub-frames of the wagons remain on the same horizontal level. The following requirements shall be fulfilled: – The device to protect against the overriding of buffers shall not interfere with the normal operation of the wagons (for example negotiating curves, Berne rectangle, shunter's handle). The device to protect against the overriding of buffers shall permit the free taking of curves by another wagon fitted with a device to protect against the overriding of buffers in a curve of 75 m radius). – The device to protect against the overriding of buffers shall not interfere with the normal functioning of the buffers (elastic or plastic deformation) (see also special provision TE 22 in 6.8.4 (b)). – The device to protect against the overriding of buffers shall function independently of the condition of the load and the wear and tear of the wagons concerned. – The device to protect against the overriding of buffers shall withstand a vertical force (upwards or downwards) of 150 kN. – The device to protect against the overriding of buffers shall be effective irrespective of whether the other wagon concerned is fitted with a device to protect against the overriding of buffers. It shall not be possible for devices to protect against the overriding of buffers to obstruct each other. – The increase in the overhang for fixing the device to protect against the overriding of buffers shall be less than 20 mm. – The width of the device to protect against the overriding of buffers shall be at least as big as the width of the buffer head (with the exception of the device to protect against the overrid-	

RID	Tank-wagons	Tank-containers
	ing of buffers located above the left-hand footboard, which shall be tangent to the free space for the shunter, although the maximum width of the buffer must be covered). – A device to protect against the overriding of buffers shall be located above every buffer. – The device to protect against the overriding of buffers shall permit the attachment of buffers prescribed in standards EN 12663-2:2010 (Railway applications – Structural requirements of railway vehicle bodies – Part 2: Freight wagons) and EN 15551:2009 + A1:2010 (Railway applications – Railway rolling stock – Buffers) and shall not present an obstacle to maintenance work. – The device to protect against the overriding of buffers shall be built in such a way that the risk of penetration of the tank end is not increased in the event of a shock. Measures to limit damage when buffers override (b) Increasing the wall thickness of the tank ends or using other materials with a greater energy absorption capacity In this case, the wall thickness of the tank ends shall be at least 12 mm. However, the wall thickness of the ends of tanks for the carriage of gases UN 1017 chlorine, UN 1749 chlorine trifluoride, UN 2189 dichlorosilane, UN 2901 bromine chloride and UN 3057 trifluoroacetyl chloride shall in this case be at least 18 mm. (c) Sandwich cover for tank ends If protection is provided by a sandwich cover, it shall cover the entire area of the tank ends and shall have a specific energy absorption capacity of at least 22 kJ (corresponding to a wall thickness of	

RID	Tank-wagons	Tank-containers
	6 mm), which shall be measured in accordance with the method described in Annex B to EN standard 13094 "Tanks for the transport of dangerous goods – Metallic tanks with a working pressure not exceeding 0.5 bar – Design and construction". If the risk of corrosion cannot be eliminated by structural measures, it shall be made possible to undertake an inspection of the external wall of the tank end, e.g. by providing a removable cover. (d) Protective shield at each end of the wagon If a protective shield is used at each end of the wagon, the following requirements shall apply: – the protective shield shall cover the width of the tank in each case, up to the respective height. In addition, the width of the protective shield shall, over the entire height of the shield, be at least as wide as the distance defined by the outside edge of the buffer heads; – the height of the protective shield, measured from the top edge of the headstock, shall cover • either two thirds of the tank diameter • or at least 900 mm and shall in addition be equipped at the top edge with an arresting device for climbing buffers; – the protective shield shall have a minimum wall thickness of 6 mm; – the protective shield and its attachment points shall be such that the possibility of the tank ends being penetrated by the protective shield itself is minimized. (e) Protective shield at each end of wagons fitted with automatic couplers If a protective shield is used at each end of the wagon, the following requirements shall apply:	

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	– the protective shield shall cover the tank end to a height of at least 1100 mm, measured from the top edge of the headstock, the couplers shall be fitted with anticreep devices to prevent unintentional uncoupling and the protective shield shall, over the entire height of the shield, be at least 1200 mm wide; – the protective shield shall have a minimum wall thickness of 12 mm; – the protective shield and its attachment points shall be such that the possibility of the tank ends being penetrated by the protective shield itself is minimized. The wall thicknesses specified in (b), (c) and (d) above relate to reference steel. If other materials are used, except if mild steel is used, the equivalent thickness shall be calculated in accordance with the formula in 6.8.2.1.18. The values of R_m and A to be used shall be specified minimum values according to material standards.	
6.8.4 d)	(Reserved)	TT 3 By derogation from the requirements of 6.8.2.4.2, periodic inspections shall take place at least every eight years and shall include a thickness check using suitable instruments. For such tanks, the leakproofness test and check for which provision is made in 6.8.2.4.3 shall be carried out at least every four years.
	TT 4 Shells shall be inspected every 4 years for resistance to corrosion, by means of suitable instruments (e.g. by ultrasound).	TT 4 Shells shall be inspected every 2½ years for resistance to corrosion, by means of suitable instruments (e.g. by ultrasound).
	TT 5 The hydraulic pressure tests shall take place at least every 4 years.	TT 5 The hydraulic pressure tests shall take place at least every 2½ years.

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	TT 6 The periodic tests, including the hydraulic pressure test, shall be carried out at least every 4 years.	(Reserved)
	TT 10 The periodic inspections according to 6.8.2.4.2 shall take place at least every four years.	TT 10 The periodic inspections according to 6.8.2.4.2 shall take place at least every two and a half years.
7.1.3		Large containers, portable tanks, MEGCs and tank-containers which meet the definition of "container" given in the CSC (1972), as amended, or in UIC leaflets 591 (status at 01.10.2007, 3rd edition), 592 (status at 01.10.2013, 2nd edition), 592-2 (status at 01.10.2004, 6th edition), 592-3 (status at 01.01.1998, 2nd edition) and 592-4 (status at 01.05.2007, 3rd edition) may not be used to carry dangerous goods unless the large container or the frame of the portable tank, MEGC or tank-container satisfies the provisions of the CSC or of UIC leaflets 591, 592 and 592-2 to 592-4.