

UIC CODE

573

7th edition, April 2008

Translation

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Technical conditions for the construction of tank wagons

Conditions techniques pour la construction des wagons-citernes

Technische Bedingungen für den Bau von Kesselwagen



UNION INTERNATIONALE DES CHEMINS DE FER
INTERNATIONALER EISENBAHNVERBAND
INTERNATIONAL UNION OF RAILWAYS

Leaflet to be classified in Volumes:

IV - Operating

V - Rolling Stock

Application:

With effect from 1 April 2008

All members of the International Union of Railways

Record of updates

1st edition, January 1978

First issue

6th edition, April 2005

Updated in line with the RID (energy absorption devices). Addition of point 1.4 and Appendix F.

Important: the articles (points) in this leaflet have been renumbered in the new edition. The first digit of each point has been increased by one (i.e. 0 becomes 1, 1 becomes 2, and so on). Please take account of this when using cross-references from other leaflets.

7th edition, April 2008

Addition of specifications for crashworthy components (point 1.1.6)

The person responsible for this leaflet is named in the UIC Code

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Summary

To simplify tank-wagon working, the standardisation characteristics mentioned in this leaflet shall apply to the construction of such types of wagon, except where there are very specific requirements to be observed.

1 - General

1.1 - General provisions

- **1.1.1** - The interchangeable parts listed in *UIC Leaflet 570* (see Bibliography - page 18) must be used for the construction of tank wagons.
- **1.1.2** - Tank wagons must comply with the following running conditions:
 - Wagons with a maximum weight-of-rail of 20 tonnes per axle:
 - wagon strength and running stability characteristics should be such that these wagons may be worked at 100 km/h with loads corresponding to the maximum possibilities of lines suitable for 20-tonne axle-loads (Category C lines);
 - wagon brake gear should be such that running under S conditions with a weight-on-rail of 20 tonnes per axle may be possible.
 - Wagons with a maximum weight-on-rail of 22,5 tonnes per axle:
 - wagon strength and running stability characteristics should be such that these wagons may be worked at 100 km/h with loads corresponding to the maximum possibilities of lines suitable for 22,5-tonne axle-loads (Category D lines) and at 120 km/h with loads corresponding to 20 tonne axle-loads;
 - wagon brake gear should be designed to allow for running under S conditions with a weight-on-rail of 22,5 tonnes per axle.
- **1.1.3** - Tank wagons must be fitted with screw brakes in accordance with the provisions of *UIC Leaflet 535-3* (see Bibliography - page 18).
- **1.1.4** - When conveyed by train-ferry, tank wagons must comply with *RIV* (see List of abbreviations - page 17) regulations.
- **1.1.5** - Tank wagons must be designed to round curves with a minimum radius of 35 m, individually and without any difficulty.
- **1.1.6** - Tank wagons carrying dangerous substances must comply with *RID* regulations

Tank wagons designed for the transport of freight in *Class 2 of Appendix C to the COTIF (RID)* (see List of abbreviations - page 17) must be fitted at least with category C buffers, as per *UIC Leaflet 526-1, point 0.2*. If such wagons are equipped with crashworthy components as per Appendix F - page 14 they may also be equipped with category A buffers provided that they comply with the specifications laid down in points F.1.1 - page 14 and F.1.2 - page 15.

However the structure of these wagons should be designed to withstand maximum loads when shunted with Category A buffers (*ERRI Report B 12/RP 17, point 3* - see Bibliography - page 18).

- R **1.1.7** - The provisions set out in point 1.1.6 are recommended for all other tank wagons.
- **1.1.8** - The underframes of tank wagons must be designed in such a way that they can be fitted with the automatic coupler at a later date.

R 1.1.9 - Prototype tests

When performing buffing tests under load, use should preferably be made of products routinely carried, and alternatively of water subject to strict compliance with the filling ratio stipulated in the *RID* (trough + load).

When the density of the product used differs appreciably from that of water, tests must be performed in accordance with the recommendations in *ERRI Report B 12/RP 17, point 3.1.2*.

- 1.1.10 - In terms of their construction and of the materials used, tank wagons must comply with the legal provisions and with the regulations of Railway Undertakings. Production-line vehicles must be in accordance with the approved prototype.

○ 1.2 - Dimensional characteristics

The standard dimensions of tank wagons are shown in Appendices [A - page 8](#) and [B - page 9](#).

The 300-mm minimum dimension stipulated for wagon extremities (see Appendices [A](#) and [B](#)) must be measured between the headstock plane and the most protruding point at tank extremity (without allowing for the possible existence of any isolation).

1.3 - Markings

○ 1.3.1 - Reference mark plates

A reference mark plate of a size corresponding to the dimensions mentioned in the following table must be placed on the left part of each side wall of tank wagons:

	Maximum	Minimum	Recommended
H	1 000	750	1 000
L	2 400	1 900	2 000
H = plate height (mm) L = plate length (mm)			

Practical examples are given in Appendix [C](#), Fig. [3 - page 10](#) and [4 - page 11](#).

1.3.2 - Mobile flaps

- R 1.3.2.1 - In the case of tank wagons designed for the conveyance of several dangerous substances, it may be necessary or worthwhile to display certain markings, such as: substance carried, loading table, danger warning sign, on mobile flaps.

These markings shall be displayed on the reference mark plates mentioned in point [1.3.1](#).

- 1.3.2.2 - These mobile flaps must be strongly-built and designed to prevent untimely collapse or loss as a result of impact or of an unintentional action.
- 1.3.2.3 - It must be possible to seal the mobile flaps in all cases.

○ 1.3.3 - Loading table

1.3.3.1 - On each side wall of the wagon, only one loading table must appear on the reference mark plate.

The loads shown on this table shall, of course, be the minimum loads resulting from application of *UIC Leaflet 700* (see Bibliography - page 18) and of the *RID*.

RID regulations must also be observed in the case of tank wagons carrying dangerous substances.

1.3.3.2 - On tank wagons designed for the conveyance of various dangerous substances and fitted with mobile flaps, the flap bearing the loading table must also bear the designation of the substance carried by this wagon (see Appendix C, Fig. 3 - page 10 and 4 - page 11, and *UIC Leaflet 575, Appendix 4*).

○ **1.3.4** - If the hazard identification plates, as per *RID Appendix VIII*, take the form of fixed or interchangeable panels, these must comply with *UIC Leaflet 575, point 2*.

○ 1.4 - Additional provisions for tank-wagons incorporating crashworthy components compliant with *RID Section 6.8.4*

1.4.1 - Tank-wagons incorporating crashworthy components compliant with *RID Section 6.8.4* and in particular with *UIC Leaflet 505-1, 521, 530-2, 535-2 et 577* (see Bibliography - page 18).

1.4.2 - No plastic deformation of the crashworthy components must occur during the buffing test performed in accordance with the provisions of *ERRI report B 12/RP 17* concerning the tank-wagon at maximum load.

The test shall be performed at speeds of up to 12 km/h.

1.4.3 - The envelope of the crashworthy components incorporated into the buffers or that of the crashworthy component + buffer assembly must comply with the provisions of *UIC Leaflet 526-1, Appendix 2*.

1.4.4 - Crashworthy components must comply with the provisions of Appendix F - page 14.

1.4.5 - The wagons must be marked in accordance with *RIV, plate 30*.

2 - Tanks and tank equipment

o 2.1 - Special provisions

2.1.1 - The tank or each of its compartments, excluding those tanks designed for the conveyance of highly-refrigerated gases (see point 2.5 - page 7), must be provided with an opening the diameter of which is large enough to allow for inspections. This opening may be situated at the top, near the middle of the cylindrical body or at one of the ends of the tank. In the first case, it must be accessible either from both sides of the wagon or directly from one of the two ends of the wagon by means of a gangway with a non-slip surface.

2.1.2 - The filling, emptying, safety or control devices (cocks, valves, valve flaps, tubes, pressure-gauges, thermometers, etc.) taking account of the nature of the commodity carried, must be so positioned that they are protected against any risk of breaking-off and damage during conveyance.

2.1.3 - The gravity-emptying tubes must be such that the wagon can be fully emptied from one of its two sides.

2.1.4 - The controls for the closing devices must be so positioned as to make it unnecessary to go beneath the underframe to operate them, except to unlock the cable control device of the internal rapid-closing safety stop-valve.

2.1.5 - If the connection between underframe and tank allows these parts to move against each other, the emptying equipment in the lower part must be fastened so that such movement does not damage it.

2.1.6 - Filling and emptying devices must be safeguarded against any accidental opening under the effect of impact or of any unintentional action. It must be possible to set filling and emptying devices in their closed position. It must be possible to close them using stoppers or flanges.

2.1.7 - Tanks emptied under pressure must be marked very legibly to show the maximum permissible pressure for the emptying operation.

When a drop nozzle is used, its lower extremity must be positioned to avoid any risk of corrosive materials being projected on braking equipment or running gear.

2.1.8 - The wagon must be designed so as not to jeopardise its operating safety in the event of overflow during tank filling or emptying.

2.1.9 - Tank wagons must be earthed in accordance with *UIC Leaflet 533* (see Bibliography - page 18).

When the tank is not underframe-welded, an earthing connection must be provided between tank wagon and underframe.

Moreover, tank wagons carrying dangerous substances must be fitted with earthing equipment.