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**Economic Commission for Europe****Inland Transport Committee****Working Party on the Transport of Dangerous Goods****Joint Meeting of the RID Committee of Experts and the  
Working Party on the Transport of Dangerous Goods**

Geneva, 17-27 September 2019

Item 2 of the provisional agenda

**Tanks****Cross-sectional shapes of shells in accordance with ADR  
6.8.2.1.18 - Guideline for the application of the proposed  
addition to footnote 3 of ADR 6.8.2.1.18****Transmitted by the Government of the United Kingdom\*,\*\***

1. During the discussion on ECE/TRANS/WP.15/2019/11 and INF.12 at the 106<sup>th</sup> session of the Working Party on the Transport of Dangerous Goods it was decided that a guideline should be put in place alongside the proposal in ECE/TRANS/WP.15/2019/11 for consideration at the autumn 2019 session of the Joint Meeting. To respect the concerns expressed in INF.12 the guideline would contain the requirements in section 6.1 of the enquiry version of the revised standard EN 13094:2019 as agreed by the members of CEN/TC 296/WG2, at which a number of the contracting countries are represented. In this way it would be possible to introduce the proposal in ECE/TRANS/WP.15/2019/11 as had already been agreed, irrespective of whether the new standard is published before the deadline of 1 June 2020 to be recognised in the 2021 edition of ADR.

2. In accordance with the enquiry version of the revised standard EN 13094:2019, the guideline would read:

“Guideline for the application of footnote 3 of ADR 6.8.2.1.18

In order to provide safe construction for the safe use of tanks in accordance with footnote 3 of ADR 6.8.2.1.18 in respect of the cross-sectional shapes of shells according to ADR 6.8.2.1.14 (a), the requirements in section 6.1 of prEN 13094:2019 to be recognised in ADR 6.8.2.6.1 are reproduced below for the purpose of the design and construction of tanks according to ADR 6.8.2.1.14 (a):

1. Shell cross section
  - 1.1 General

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\* In accordance with the programme of work of the Inland Transport Committee for 2018-2019, (ECE/TRANS/2018/21/Add.1, Cluster 9, (9.2)).

\*\* Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2019/39.

A shell may have a circular, elliptical or other cross section shape (including box-shaped) or combinations thereof, as defined in EN 14564.

Where a combination of shapes is used for a cross section, the required minimum thickness for the whole cross section at that point according to 6.8.1 shall be the greatest minimum thickness required for the shapes used.

#### 1.2 Requirements for shells of non-circular cross section

(a) The radius of convexity of the shell wall shall not exceed 2 m at the sides and 3 m radius at the top and the bottom;

(b) There shall be a minimum radius of 200 mm linking the top/bottom and side convexities.

NOTE 6.8.1 of prEN 13094:2019 provides a calculation for an equivalent diameter to be calculated.

#### 1.3 Sumps and other projections outside the shell

1.3.1 Projections outside the basic cross-section of a shell shall be kept to a minimum and protection shall be provided from all directions on the shell unless it is provided by vehicle components (e.g. chassis members, suspension components, axles, etc.). The cross-sectional area of each projection shall not exceed 10 % of the cross-sectional area of the shell at that point without the projection. When the projection is not protected, the thickness shall not be less than the thickness specified for the shell given in 6.8.1. When the projection is protected, the thickness shall be the same thickness as the shell.

1.3.2 Shells and their compartments may be provided with sumps and/or internal channelling in order to:

- assist the complete discharge of the substance carried;
- facilitate the removal of entrained water from the substance carried; or
- locate a foot valve away from an area where there exists a risk of damage, for example near the coupling section on a semi-trailer.

Sumps shall not protrude more than 150 mm from the contour of the shell.

Internal channelling and sumps shall be manufactured from the same material as the shell to which they are fitted; flat material may be used. Their minimum thickness shall be at least equal to that of the shell as given in 6.8.2.1.

A sump may consist of a vertical cylindrical section combined with internal or external channelling sections to lower the mounting flange of the foot valve.

#### 1.4 Cut-out sections within the contour of a side or bottom of the shell

##### 1.4.1 Side cut-outs to accommodate service equipment

Side cut-outs to provide space for service equipment such as flow meters shall be designed in accordance with the following criteria:

- The total cross-sectional area of cut-outs at any point shall not exceed 20 % of the total cross-sectional area of the shell without cut-outs where the cut-outs are located;
- The length of the cut-out shall not exceed 40 % of the length of the shell and in any case not exceed 1 400 mm;
- The minimum distance from the sides of the cut-outs to the ends shall be at least 200 mm;
- The height and depth of the cut-out shall be such that it does not encroach within 50 mm of the centre lines of the shell;
- The thickness shall not be less than the thickness specified in 6.8.1;
- The welds shall be fully penetrated (or made of lap joints);

- The cut-out shall not extend beyond one compartment or a section of shell.

#### 1.4.2 Cut-outs to accommodate tank mountings or other structural equipment

Cut-outs to accommodate structural equipment (e.g. couplings for trailers or semi-trailers), shall be designed in accordance with the following criteria:

- The cross-sectional area of the cut-out shall not exceed 30 % of the total cross-sectional area of the shell without cut-out, where it is located;
  - The length of the cut-out shall not exceed 35 % of the length of the tank;
  - Service equipment shall not be welded directly to a concave surface within the cut-out;
  - The weld shall be fully penetrated;
  - The minimum thickness shall not be less than the thickness specified in 6.8.1;
  - The joint of the end of the structural plate to the shell shall be to a partition whose design complies with that for an end;
  - The design shall not compromise complete drainage of the product to be carried.”
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