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**ECONOMIC COMMISSION FOR EUROPE**

**INLAND TRANSPORT COMMITTEE**

**Working Party on the Transport  
of Dangerous Goods**  
**(Sixty-seventh session,  
Geneva, 8-12 November 1999)**

**TANKS FOR THE TRANSPORT OF DANGEROUS GOODS-  
NON-PRESSURE METALLIC TANKS – DESIGN AND CONSTRUCTION**

Transmitted by the Government of Italy

**Reformulation of the document TRANS/WP.15/R.405 of the 5<sup>th</sup> of August 1996**

Following the comments made by some representatives at WP 15 during the last meeting, which was held from 16 to 20 November 1998, as agreed during the committee, the Italian delegation submits this redrafted proposal concerning the measures to be adopted with regard to protection for polycentric tanks against damage through lateral impact or overturning.

These additional measures have been introduced to increase the safety of polycentric tanks in order to achieve a safety level at least equal to that for circular and elliptical tanks.

The new text of the Italian proposal is given below:.

"**211 127** (b) For shells intended for the carriage of other substances, there is protection against damage when:

4. Steel of forms other than in 1.:

- 1) Box-shaped tanks are provided all around the mid-point of their vertical height and over at least 30% of their height with an additional protection designed in such a way as to offer specific resilience at least equal to that of a shell constructed in mild steel of a thickness of 5 mm (for a shell diameter not exceeding 1.80 m) or 6 mm (for a shell diameter exceeding 1.80 m). The additional protection shall be considered to have been met without further proof of the specific resilience when the additional protection involves the welding of a plate of the same material as the shell to the area to be strengthened, so that the minimum wall thickness is in accordance with paragraph (3).

This protection is dependent upon the possible stresses exerted on mild steel shells in the event of an accident, when the ends and walls have a thickness of at least 5 mm for a diameter not exceeding 1.80 m or at least 6 mm for diameter exceeding 1.80 m. If another metal is used, the equivalent thickness shall be obtained in accordance with the formula in paragraph (3).

- 2) Policentric cross section tanks, having a maximum radius of 3 m at the top and bottom, a maximum radius of 2 m at the sides and a minimum radius of 300 mm linking the top and sides, the shell is equipped with strengthening members comprising partitions or surge plates, so placed that the following conditions are met:

- Distance between two adjacent strengthening elements # 1.40 m
- Volume contained between two adjacent partitions or surge plates # 7500 l
- The junction between the front and the rear ends to the shell shall be protected by a stiffening ring or the thickness of the front and the rear ends shall meet the minimum values provided by paragraph (3)
- The capacity of any compartement of the tank shall not exceed 15000 l (except for tanks dedicated to the transport of bitumen).

The vertical cross section of a ring, with the associated coupling, shall have a section modulus of at least  $10 \text{ cm}^3$ .

External rings shall not have projecting edges with a radius of less than 2.5 mm.

Partitions and surge plates shall conform to the requirements of paragraph (7).

The thickness of the partitions and surge plates shall in no case be less than that of the shell."

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