

(Sixty-ninth session,
Geneva, 13-17 November 2000)

**Informal document regarding progress of CEN standards
for reference in chapter 6.8 of the ADR**

Transmitted by the European Committee for Standardisation (CEN)

The objective of this document is to report the progress of CEN in preparing standards for the design, construction and operations of tank-vehicles.

The document concerns two documents, one that has been ratified since the last Spring WP meeting and another that is likely to be ratified before the next WP15 meeting in spring 2001.

If both documents are ratified (published) on time for the next WP15 meeting, formal approval to refer to them in 6.8.2.6 will then be requested as follows:

DOC. Reference	Title of Document	Applicable sections
EN 12252:2000	Equipping of LPG road tankers	6.8.3.2
prEN 12493 (except Annex C)	Design and manufacture of welded steel tanks for LPG road tankers	6.8.2.1; 6.8.2.4.1 (with the exclusion of the leakproofness test); 6.8.2.5.1 and 6.8.3.5.1

The set of two standards covers the requirements relevant to the design, construction and testing of tanks for LPG in chapter 6.8 . However, the pressure test of the piping after piping erection and the leakproofness test after mounting the equipment (valves, piping, etc) to the tank is not covered in neither standard.

It has been decided by TC286 at their plenary meeting in October 2000-Berlin to cover these requirements in EN 12252 and to proceed as soon as possible with an amendment of this standard in order to remove the exclusion in 6.8.2.4.1

A synopsis of the assessments made by the CEN consultant for these standards is attached as Annex 1 .The CEN representative is available for further comments on the standards at the WP 15 meeting or afterwards by fax at +32 10 88 96 82 or by email at wolfsp@apci.com

Annex 1: Synopses of assessment of standards proposed for references in ADR

1. EN 12252:2000 Equipping of LPG road tankers

Conclusions: This standard supplements the standard prEN 12493 for the design, construction and testing of LPG road-tankers. It covers the requirements in ADR for the fitting of equipment and accessories as outlined in section 6.8.3.2. The standard does offer an alternative method of sizing the pressure relief valves other than the one described in 6.8.3.2.9. This additional method has been proposed by AEGPL to WP15 but has not yet been approved by WP15 (Doc. Trans/WP15/2000/12).

Table of concordance between essential requirements of RID/ADR and clauses of EN 12252:2000

Sections of ADR	clauses of standard
6.8.2.1.2 dynamic forces for shells and <u>fastenings</u>	5.2 + Annex B
6.8.3.2.1 closing of discharge pipes with blank flanges	6.1.3.1
6.8.3.2.3 instant closing devices for flammable liquefied gases	6.1.3.3 +9
6.8.3.2.4 protection of openings more than 1.5 mm	6.1.3.1
6.8.3.2.5 requirements for installation of gauges	8.1/8.2/8.3
6.8.3.2.8 to 12 safety valve requirement + (1) max 2 valves, min 20 cm ² per 30 m ³ opens at 0.9/1 Pt	8.9+ Annex A (alternative sizing)

2. prEN 12493 Design and manufacture of welded steel tanks for LPG road tankers

Conclusions: The drafting of this standard started in 1992 and a first draft was presented in 1997 to the WP15 by AEGPL in the document TRANS/WP15/R403. The standard was further modified to take into account the comments received when the document was discussed in 1998, in particular concerning the reference temperatures different to those in ADR. These “other” reference temperatures and the related test pressure and fill conditions have been put in an informative Annex C that CEN proposes to exclude from the reference to the standard. This Annex C will be of use for the countries that allow the operation of road-tankers built for a different climatic zone.

The standard has been further amended with regard to the requirements on the surge plates and to requirements for the stresses local to the supports. Still, the design criteria for resistance to pressure are based on prEN13445 (the future “European construction code for unfired pressure vessels” that will satisfy the requirements of the EU Directive on Pressure Equipment) and not on the design criteria of ADR. This to explain why this standard uses maximum stress values lower than in paragraph 6.8.2.1.16 by a factor of 1.2 for the ratio with R_m and by a factor of 1.12 for the ratio with R_e. In order not to be penalised for the minimum wall thickness the standard uses a design pressure which is the test pressure as defined in ADR for the mixture concerned divided by 1.2.

The formula for the wall thickness used in the standard is based on the outer diameter while it is based on the inner diameter in paragraph 6.8.2.1.17.

Nevertheless; the values calculated according to the criteria of the standard are, within acceptable tolerances (less than 4% of the wall thickness), identical to the thickness values calculated according to the formula in 6.8.2.1.17.

The minimum wall thickness for protection against damage is a linear value and not a stepped value according to the diameter of the shell membrane. However, the requirements for the surge plates in 5.2 provide a level of safety equivalent to the requirements of 6.8.2.1.19 considering that the minimum design pressure of 10 bars generates a minimum wall thickness higher than what is allowed in 6.8.2.1.19.

In conclusion, although the standard makes use of design criteria different in some cases than those in ADR, the outcome is very similar.

Table of concordance between essential requirements of ADR and clauses of PrEN 12493

Marginals of ADR	Clauses of standard
Basic principles	
6.8.2.1.1/6.8.2.1.2 general design requirements, stresses and forces	5.4
6.8.2.1.7 protection against negative pressure	5.6

Materials	
6.8.2.1.8 design temperature range	4.1
6.8.2.1.10 weldability of material; limits for fine-grained steels	4.1 + Annex A
6.8.2.1.11/12 mechanical characteristics limitations Re/Rm < 0.85 elongation >16 or 20 %	4.2
Calculation of the wall thickness	
6.8.2.1.13/15/16 design stress limitations < 0.75 Re or < 0.5 Rm	5.4 +D1
6.8.2.1.17/18 Minimum shell thickness	D3 (linear value instead of stepped value)
6.8.2.1.19/20 protection against damage	5.2 (surge plates)
6.8.2.1.22 surge plates/partitions	5.2
6.8.2.1.23/6.8.3.4.5 welding and inspection of welds	8.5.4 and 8.5.5; 10.3
Tests	
6.8.2.4.1 Initial inspection requirements incl.:	
- external/internal examination	10.2
- hydraulic pressure test (pneumatic test if accepted by competent authority)	10.5+ Annex I (norm.) 10.8 + Annex K (norm.)
6.8.3.4.4 determination of capacity	10.9
6.8.3.4.9 leakproofness test	Not in scope, see comment
Marking	12 + Annex L (normative)
6.8.2.5.1/6.8.3.5.1 marking on tank itself	Table L1
- Approval number	2
- Manufacturer's name or mark	1
- Manufacturer serial number	3
- Year of manufacture	4
- Test pressure	5
- Capacity shell/each element	6
- Design temperature	8
- Date of initial test + stamp of expert	15
- Material of the shell/ref. to materials standards	9
- proper shipping name (if approved for one substance only)	13
- maximum permissible load	14
6.8.2.5.2/6.8.3.5.6 marking on tank-vehicle	Not in scope of standard:
- name of owner or operator	
- unladen mass	
- maximum permissible mass	
- tank code	
- inscription "minimum filling temperature allowed"	
- proper shipping name	
6.8.5 Additional requirements for welded shells	10.2.5.4/6 +ref to EN875
6.8.5.3. Impact-strength tests	
