

Economic Commission for Europe

Inland Transport Committee

Working Party on the Transport of Dangerous Goods

9 September 2015

**Joint Meeting of the RID Committee of Experts and the
Working Party on the Transport of Dangerous Goods**

Geneva, 15–25 September 2015

Item 6 of the provisional agenda

Tanks

**Information on the revision of EN 14025 on design and
construction of metallic pressure tanks**

Transmitted by the European Committee for Standardisation (CEN)

1. At the Joint Meeting in 2007 and 2008, the Working Group on Tanks considered several documents from Belgium and Germany on the requirement in 6.8.2.2.3 for the shell to be capable of withstanding an explosion resulting from the passage of the flame into the tank (see in particular item 4 in ECE/TRANS/WP.15/AC.1/112/Add.1).
2. EN 14025:2013 ‘Tanks for transport of dangerous goods – Metallic pressure tanks – Design and construction’ is under revision to introduce implementation requirements on this subject.
3. For information of the Working Group on Tanks, the final draft of EN 14025:2013/FprA1:2015 is attached in the Annex.



« Tanks for the transport of dangerous goods»

CEN/TC 296

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Draft Decision CEN/TC 296 C08/2015

Please find here below the draft decision **C08/2015** on the future of prEN 14025:2013/prA1 after CEN Enquiry:

Draft Decision C08/2015 taken by TC 296 on 2015-XX-XX

Subject : Decision on the future of prEN 14025:2013/prA1 after CEN Enquiry

TC 296,

- considering the results of the Enquiry ballot;
- considering the table of decisions and the formal written proposals as distributed after the comments decision meeting;
- considering the CEN/CENELEC Internal Regulations - Part 2, clause 11.2.3;
- considering Decisions BT 34/2002, BT 42/2003 and related document BT N 6962 concerning timeframes for the development of ENs;
- considering Decision BT 35/2014 to associate a vote to the CEN Enquiry and to allow Technical Bodies to decide to skip the Formal Vote
- considering Decision 49/2014 to allow Technical Bodies to decide to skip the Formal Vote through a TC decision based on simple majority only;

decides to proceed to Formal Vote and begin work on drafting the final draft **based on the edited CCMC Enquiry version as voted on by CEN members** for prEN 14025:2013/prA1

Tanks for the transport of dangerous goods - Metallic pressure tanks - Design and construction.

The decision was taken by *unanimity or simple majority with N positive votes, N negative vote(s) and N abstention(s).*

Please vote on [CIB balloting](#) portal before the **30th of September 2015**.

CEN/TC 296

Date: 2015-07

EN 14025:2013/FprA1:2015

CEN/TC 296

Secretariat: AFNOR

Tanks for the transport of dangerous goods — Metallic pressure tanks — Design and construction

Tanks für die Beförderung gefährlicher Güter — Metallische Drucktanks — Auslegung und Bau

Citernes destinées au transport de matières dangereuses — Citernes métalliques sous pression — Conception et fabrication

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Contents

	Page
1 Modification to 5.1, General	4
2 Modification to 6.3.3.5.1, General	4
3 Modification to 6.4.1, General	4
4 Modification to A.5.2	4
5 Addition of new Annex B, Explosion pressure shock resistant design of tanks	5
6 Modification to the Bibliography	6

Foreword

This document (EN 14025:2013/FprA1:2015) has been prepared by Technical Committee CEN/TC 296 "Tanks for transport of dangerous goods", the secretariat of which is held by AFNOR.

This document is currently submitted to the Formal Vote.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

Compared to EN 14025:2013 the following changes have been made:

- a) in 5.1, General, 3) a reference to the new annex B has been added;
- b) in 6.3.3.5.1, non-numbered equation under Equation (5) has been deleted;
- c) in 6.4.1, General, the calculation for external pressure has been changed;
- d) in A.5.2 the layout of the equations has been corrected;
- e) a new Annex B, Explosion pressure shock resistance design of tanks, has been added.

1 Modification to 5.1, General

Replace the text of 3) with

"explosion-pressure-shock resistant condition (if required) (see Annex B);".

2 Modification to 6.3.3.5.1, General

Delete the non-numbered equation under Equation (5)

$$" f_d = \frac{R_{p0,2/T}}{1,5} "$$

3 Modification to 6.4.1, General

Replace

" f (in EN 13445-3) = nominal design stress (allowable stress) = f_d (in EN 14025)"

with

" σ_e (in EN 13445-3) = nominal design stress (allowable stress) = f_d (in EN 14025)".

4 Modification to A.5.2

Replace

$$"R = 0,8$$

$$D_e = 0,8 [2 \cdot 300 + 2 \cdot 5^{**}] = 1 \, 848 \text{ mm}$$

**) assumed value using the results up to now

$$r = 0,154$$

$$D_e = 0,154 \times 2 \cdot 310 = 355,74 \text{ mm}"$$

with

$$"R = 0,8 \times D_e = 0,8 [2 \cdot 300 + 2 \cdot 5^{**}] = 1 \, 848 \text{ mm}$$

**) assumed value using the results up to now

$$r = 0,154 \times D_e = 0,154 \times 2 \cdot 310 = 355,74 \text{ mm}."$$

5 Addition of new Annex B, Explosion pressure shock resistant design of tanks

Add

"Annex B (informative)

Explosion pressure shock resistant design of tanks

B.1 Tanks are explosion pressure shock resistant if they are designed and constructed in such a way that these tanks are able to resist an explosion pressure occurring due to an internal explosion without bursting. Permanent deformations are permissible.

The explosion pressure relevant for the proof of the explosion shock resistance depends on the ignition characteristics of the inflammable substance and on the internal initial pressure at which an ignition takes place. Concerning tanks for the transport of inflammable substances it has to be assumed that an interference-related ignition occurs outside the tank causing an explosion running via an operationally free opening (unclosed tank opening) inside the tank.

The initial pressure inside the tank can be set equal to the atmospheric pressure of 1 000 mbar, therefore. Among all substances examined so far¹⁾ at an initial pressure of 1 000 mbar a mixture of 8,0 (volume)% ethylene in air exhibits the highest value for the explosion pressure of 9,7 bar (absolute).

B.2 A tank is considered to be explosion pressure shock resistant if the tank design will be examined experimentally, mainly by carrying out successfully an explosion test with a specimen of that design under atmospheric conditions applying a gas/air-mixture as mentioned above.

B.3 Furthermore a tank is considered to be explosion pressure shock resistant if the calculation of all pressure bearing parts of the tank will be carried out on the basis of the maximum explosion pressure (i.e. 9,7 bar (absolute) at least) following the requirements of this European Standard. Due to the high ductility of the tank materials assigned (elongation at rupture in accordance with 6.8.2.1.12 and 6.8.3.1.1 RID/ADR) and with respect to EN 14460:2006, 6.1, first paragraph, the calculation pressure shall be 8,7 bar / 1,5 as a load case in operating conditions. Partitions can be regarded as explosion shock resistant on the adherence to the following conditions also, even if the calculation would result in a higher wall thickness than those of the cylindrical part of the tank:

- the cylindrical part and partitions have to be manufactured from uniform material;
- the wall thickness has to be appropriate for a test pressure of at least 4 bar;
- the wall thickness has to be not smaller than the wall thickness of the cylindrical part which results from its explosion pressure shock resistant design;
- the partition shall be tested with a test pressure of 8,7 bar on its konvex side (that means outer pressure to the partition) within the framework of the type approval.

B.4 A tank is considered as explosion pressure shock resistant, too, if it is proven that the tank is able to withstand a hydraulic pressure test carried out at a test pressure equal to 1,3 times the maximum explosion pressure (i.e. 9,7 bar (absolute) at least) without bursting.

B.5 Verifications according to B.3 and B.4 can be applied only for tanks without installations which do decrease the tank cross section considerably (like surge plates in particular) which can lead to a further increase of explosion pressure and effect."

1) Substances which are inclined to a spontaneous decomposition have to be excluded from the application of the measures mentioned above.

6 Modification to the Bibliography

Add "[8] EN 14460, *Explosion resistant equipment*" and update the following items.