

Cryogenic vessels - Large transportable vacuum insulated vessels - Part 2: Design, fabrication, inspection and testing

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13530-2:2003 sisaldab Euroopa standardi EN 13530-2:2002 ja selle paranduse EN 13530-2:2002/AC:2006 ingliskeelset teksti.	This Estonian standard EVS-EN 13530-2:2003 consists of the English text of the European standard EN 13530-2:2002 and its corrigendum EN 13530-2:2002/AC:2006.
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English version

Cryogenic vessels - Large transportable vacuum insulated vessels - Part 2: Design, fabrication, inspection and testing

Réceptifs cryogéniques - Grands réceptifs transportables
isolés sous vide - Partie 2: Conception, fabrication,
contrôles et essais

Kryo-Behälter - Große ortsbewegliche, vakuum-isolierte
Behälter - Teil 2: Bemessung, Herstellung und Prüfung

This European Standard was approved by CEN on 29 May 2002.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document EN 13530-2:2002 has been prepared by Technical Committee CEN/TC 268 "Cryogenic vessels", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2003, and conflicting national standards shall be withdrawn at the latest by March 2003.

The European Standard has been submitted for reference into the RID and/or in the technical annexes of the ADR.

Therefore the standards listed in the normative references and covering basic requirements of the RID/ADR not addressed within the present standard are normative only when the standards themselves are referred to in the RID and/or in the technical annexes of the ADR.

EN 13530 consists of the following parts under the general title, *Cryogenic vessels – Large transportable vacuum insulated vessels*:

- *Part 1: Fundamental requirements*
- *Part 2: Design, fabrication, inspection and testing*
- *Part 3: Operational requirements*

The annexes A, D and F are informative, the annexes B, C and E are normative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies requirements for the design, fabrication, inspection and testing of large transportable vacuum insulated cryogenic vessels of more than 1 000 l volume, which are permanently (fixed tanks) or not permanently (demountable tanks) attached to a vehicle, for carriage by road. However, it can be used for other mode of transport providing the specific regulations/requirements are complied with.

This European Standard applies to large transportable vacuum insulated cryogenic vessels for fluids specified in EN 13530-1:2002 and does not apply to vessels designed for toxic fluids.

This European Standard does not include the general vehicle requirements e.g. running gear, brakes, lighting etc. that should be in accordance with the relevant standards/regulations.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 287-1:1992, *Approval testing of welders - Fusion welding - Part 1: Steels.*

EN 287-2:1992, *Approval testing of welders - Fusion welding - Part 2: Aluminium and aluminium alloys.*

EN 288-3:1992, *Specification and approval of welding procedures for metallic materials - Part 3: Welding procedure tests for the arc welding of steels.*

EN 288-4:1992, *Specification and approval of welding procedures for metallic materials - Part 4: Welding procedure tests for the arc welding of aluminium and its alloys.*

EN 288-8:1992, *Specification and approval of welding procedures for metallic materials - Part 8: Approval by a pre-production welding test.*

EN 473:2000, *Non-destructive testing - Qualification and certification of NDT personnel - General principles.*

EN 875:1995, *Destructive tests on welds in metallic materials - Impact tests - Test specimen location, notch orientation and examination.*

EN 895:1995, *Destructive tests on welds in metallic materials - Transverse tensile test.*

EN 910:1996, *Destructive tests on welds in metallic materials – Bend tests.*

EN 1252-1:1998, *Cryogenic vessels - Materials - Part 1: Toughness requirements for temperatures below -80 °C.*

EN 1252-2:2001, *Cryogenic vessels - Materials - Part 2: Toughness requirements for temperatures between -80 °C and -20 °C.*

EN 1418:1997, *Welding personnel – Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanised and automatic welding of metallic materials.*

EN 1435:1997, *Non-destructive examination of weld – Radiographic examination of welded joints.*

EN 1626:1999, *Cryogenic vessels - Valves for cryogenic service.*

EN 1797:2001, *Cryogenic vessels - Gas/material compatibility.*

EN 10028-4:1994, *Flat products made of steels for pressure purposes – Part 4: Nickel alloy steels with specified low temperature properties.*

EN 10028-7:2000, *Flat products made of steels for pressure purposes - Part 7: Stainless Steels.*

EN 12300:1998, *Cryogenic vessels - Cleanliness for cryogenic service.*

EN ISO 6520-1:1998, *Welding and allied processes - Classification of geometrical imperfections in metallic materials – Part 1: Fusion welding (ISO 6520-1:1998).*

EN 13068-3:2001, *Non-destructive testing – Radioscopic testing – Part 3: General principles of radioscopic testing of metallic materials by X- and gamma rays.*

prEN 13445-3:1999, *Unfired pressure vessels – Part 3: Design.*

EN 13530-1:2002, *Cryogenic vessels - Large vacuum insulated vessels - Part 1: Fundamental requirements.*

prEN 13648-3:2001, *Cryogenic vessels – Safety devices for protection against excessive pressure – Part 3: Determination of required discharge capacity and sizing for relief devices.*

ISO 1106-1:1984, *Recommended practice for radiographic examination of fusion welded joints - Part 1: Fusion welded butt joints in steel plates up to 50 mm thick.*

3 Terms, definitions and symbols

For the purposes of this European Standard, the following terms, definitions and symbols apply.

3.1 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply in addition to those given in part 1 of this standard.

3.1.1

large transportable vacuum insulated vessel

vessel of more than 1 000 l volume intended for one or more cryogenic fluids, consisting of an inner vessel, an outer jacket, all of the valves and accessories and additional framework

3.1.2

fixed tank (tank vehicle)

large transportable vessel permanently attached to a vehicle or to units of running gear used in its stead

3.1.3

demountable tank

large transportable vessel non permanently attached to a vehicle. When attached to the carrier vehicle, the demountable tank meets the requirements prescribed for a fixed tank. It is designed to be lifted only when empty

3.1.4

inner vessel

pressure vessel proper intended to contain the cryogenic fluid

3.1.5

outer jacket

gas-tight enclosure which contains the inner vessel and enables a vacuum to be established

3.1.6

automatic welding

welding in which the parameters are automatically controlled. Some of these parameters may be adjusted to a limited extent, either manually or automatically, during welding to maintain the specified welding conditions