

Cryogenic vessels – Transportable vacuum insulated vessels of not more than 1 000 litres volume
 Part 3: Operational requirements
 English version of DIN EN 1251-3

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Kryo-Behälter – Ortsbewegliche, vakuum-isolierte Behälter mit einem Fassungsraum von nicht mehr als 1 000 Liter – Teil 3: Betriebsanforderungen

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National foreword

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English version

Cryogenic vessels – Transportable vacuum insulated vessels of not more than 1 000 litres volume

Part 3: Operational requirements

Réceptacles cryogéniques – Réceptacles transportables, isolés sous vide, d'un volume n'excédant pas 1 000 litres – Partie 3: Exigences fonctionnement

Kryo-Behälter – Ortsbewegliche, vakuum-isolierte Behälter mit einem Fassungsraum von nicht mehr als 1 000 Liter – Teil 3: Betriebsanforderungen

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

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Central Secretariat: rue de Stassart 36, B-1050 Brussels

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Foreword

This European Standard 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of an identical text or by endorsement, at the latest by July 2000, and conflicting national standards shall be withdrawn at the latest by July 2000.

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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

The 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.

The other parts of EN 1251 are :

- Part 1 : Fundamental requirements ;
- Part 2 : Design, fabrication, inspection and testing.

1 Scope

This European Standard specifies operational requirements for transportable vacuum insulated cryogenic vessels of not more than 1 000 litres volume designed to operate above atmospheric pressure. Appropriate parts may be used as a guidance for a vessel design to operate open to the atmosphere.

For small cryogenic vessels specially designed for personal medical use, this standard can be used as a guide only.

The scope includes putting into service, filling, withdrawal, transport within the location, storage, maintenance, periodic inspection and emergency procedures. Operational requirements for vessels used on public roads, sea and air are not covered.

For the transportation of these vessels by public road, rail, sea and air, other requirements apply; these are defined in specific regulations.

This standard applies to vessels for cryogenic fluids as specified in EN 1251-1. The additional requirements for flammable fluids are detailed in clause 16.

For existing small transportable cryogenic vessels, see annex C.

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.

EN 1251-1, *Cryogenic vessels - Transportable vacuum insulated vessels of not more than 1 000 litres volume - Part 1: Fundamental requirements*

EN 12300, *Cryogenic vessels - Cleanliness for cryogenic service*

3 Definitions

For the purposes of this standard, the following definitions apply in addition with those given in EN 1251-1 :

3.1

putting into service

the operation by which a vessel is prepared to be used. It applies to either a new vessel being used for the first time or an existing vessel being returned to service

3.2

filling

the operation by which a vessel undergoes a prefill check, filling with a cryogenic fluid and an after fill check

3.3

withdrawal

the operation by which vessels are connected to supply equipment and product is drawn off

3.4

outdoor location

location outside of any building or structure and not enclosed by more than two walls

3.5

underground location

areas or rooms whose ground or floor is on all sides lower than the adjacent ground surfaces

3.6

safety distance

the safety distance from a piece of equipment with inherent hazard is that minimum separation which will mitigate the effect of a likely foreseeable incident and prevent a minor incident escalating into a larger incident. The safety distance will also provide protection from foreseeable external impact (e.g. roadway, flare) or activities outside the control of the operation (e.g. plant or customer station boundary).

Included in safety distances are :

- distances between vessels and neighbouring installations, buildings or public roads, the purpose of which is to protect the vessels from any damage, such as heating as a result of fire, or mechanical damage ;
- the distance between the vessel and an object outside the installation, which has to be protected from the effects of a gas release arising from normal operation.

These distances are measured from those points on a vessel from which in the normal course of operation an escape of product may occur, e.g. vent point, fill connection, flanges or other mechanical joints.

The safety distance is the distance, outside of which :

- in the case of flammable gases danger through formation of an explosive atmosphere is eliminated, i.e. the lower explosive limit (LEL) is not exceeded ;
- in the case of inert and oxidising gases, danger from a lack of oxygen or enrichment is eliminated.

The safety distances given in annex B are based on experience and calculation of minor releases.

The safety distances are not intended to provide protection against catastrophic events or major releases and these should be addressed by other means to reduce the frequency and/or consequences to an acceptable level

3.7

vessel

throughout EN 1251-3, vessels means transportable cryogenic vessel as defined in EN 1251-1, clause 3.2.

4 Preliminaries before putting into service

Before putting into service verification shall take place to ensure that the vessel is suitable for the intended service and that the marking, labelling and handover documents are complete.

4.1 Marking and labelling

Marking and labelling shall be in accordance with EN 1251-1.

4.2 Handover documents

In addition to the manufacturer's documentation, where necessary the cryogenic vessel shall be accompanied by vessel specific documents and instructions for all items :

- operations ;
- auxiliary equipment ;
- inspection records.

These documents shall be retained by the owner of the vessel.

The user shall have appropriate operating instructions available. Such instructions may be attached to the vessel in a permanent manner.

5 Personnel training

Only persons trained for the specific task shall be allowed to put into service, fill, handle, operate or maintain the vessel.

The training programme shall include :

- normal procedures ;
- product and hazard identification ;
- safe operating limits ;
- emergency procedures (see annex A) ;
- physical and chemical properties of the vessel's contents and their effects on the human body ;
- personnel protective equipment (e.g. safety boots/goggles/gloves).

Training shall be repeated as necessary to ensure that personnel remain competent. A training record should be maintained which details the information personnel have received.

6 General safety requirements

6.1 General

Marking and labelling shall not be removed or defaced.

Appropriate warning signs regarding product hazards and personnel protective equipment requirements should be displayed.

Parts under pressure shall be disconnected only if they have been previously depressurized.

When under pressure, leaking valves or connections shall be tightened using suitable tools and procedures.

Direct flame or intense heat shall never be used to raise the pressure.

Vessels and their equipment shall be kept free from oil and grease. Cleanliness requirements shall be in accordance with EN 12300.

Valve outlets shall be kept clean, dry and free from contaminants.

Vessels and their accessories shall not be modified without proper authorisation.

6.2 Safety considerations

In all operations and training the following safety considerations shall be taken into account :

- small amounts of cryogenic fluids will produce large volumes of vaporised gas. Spillage of cryogenic fluids can result in an oxygen deficient atmosphere, or in the case of vaporizing oxygen, in an oxygen enriched atmosphere. Provision is to be made for appropriate measures for this, e.g. ventilation ;
- due to the possibility of cold embrittlement, cryogenic fluids shall not come in contact with materials (metals or plastics) which are not suitable for low temperatures ;
- vaporizing cryogenic fluids produce gases that are always heavier than air and can accumulate in lower areas (e.g. pits, trenches) ;
- because of their extremely low temperatures, cryogenic fluids will produce cold burns when coming in contact with the skin. Cold burns can also be produced from contact with uninsulated equipment ;

- oxygen enrichment due to liquefaction of ambient air can occur on the cold surfaces of uninsulated equipment which contain fluids with a boiling point lower than oxygen.

7 Putting into service

This operation shall follow a written procedure and the results of the steps involved should be recorded (e.g. in a check list). Such lists should be retained by the operating company.

Vessel and accessories shall be visually checked for damage.

It shall be verified that :

- valves and accessories are appropriate for the intended service, comply with the flow-sheet and are appropriately marked ;
- relief device with a set pressure not higher than the maximum allowable working pressure of the vessel are fitted. Devices requiring approval shall be correctly stamped and matching certificates shall be available ;
- all valves are easy to operate ;
- all labels are clearly displayed and appropriate for the product ;
- all required tests have been carried out.

The vessel shall be purged with an appropriate gas at a temperature above 0°C until the gas emerging from the vessel is sufficiently dry and pure.

The vessel shall be cooled down according to the manufacturer's recommendations. Steps shall be taken to avoid uncontrolled pressure rise due to rapid liquid evaporation. The cool down gas chosen shall take into account the risk of solidification.

Measuring and controlling devices (e.g. level gauge, pressure regulator etc.) shall be checked for correct operation or setting.

8 Location

The requirements listed in this clause are valid for storage as well as other activities such as filling, withdrawal etc. :

- vessels shall be located in a suitable area such as in the open air or in a sufficiently ventilated enclosed area, away from sources of heat (e.g. welding source, open fire etc.). Hot work shall be subjected to appropriate safety measures. The area shall be kept clear and suitable access shall be provided ;
- vessels should not be located underground. However, where this is unavoidable, relief valve outlet(s) should be piped to a safe external venting point and the underground location shall have sufficient continuous ventilation to deal with product releases arising from normal operation ;
- adequate ventilation shall be provided. In locations over ground level, natural ventilation is generally sufficient, provided that the room is large enough or that the outdoor area is not enclosed by walls. In other circumstances, forced ventilation or other precautions shall be provided ;
- the floor of the designated area shall be level and strong enough to take the weight of the full vessel. The vessel shall be located at a sufficient distance from the normal paths used by people or vehicles. Water accumulation in the vicinity of the vessel shall be avoided ;
- vessels and their components shall be protected against mechanical damage ;
- in case of emergency, adequate means of escape shall be provided. Emergency exits shall be kept clear at all times ;

- all doors/gates should be preferably outward opening and wide enough to provide an easy access and exit route for personnel ;
- vessels which exhibit a risk of toppling over shall be firmly secured in the upright position ;
- the operating area should be clearly marked with appropriate warning signs. These can be displayed on the vessel ;
- if vessels are indoors for extended periods (i.e. overnight or weekends) all vent and relief valve outlets should be piped to a safe place. The vent pipework shall be designed in such a way so as to prevent rainwater accumulation, or blockage by airborne material ;
- access by unauthorized persons shall be prevented. On sites without sufficient supervision fencing shall be provided.

9 Transport within the location

This clause refers to the transport of filled vessels other than by public road, rail, water-ways, sea and air ; these activities are fully covered by specific regulations.

Before transport, the vessels shall be examined for signs or damage or leaks and valves shall be checked to ensure that they are in the correct positions.

Cryogenic vessels should never be subjected to impacts or falls ; these could damage the outer jacket or the suspension system of the inner vessel causing loss of insulating properties. Where vehicles are used (either powered or unpowered) the vessels shall be secured against toppling over.

The vessels shall be handled only by those means for which they are designed and equipped.

Because of the potential hazard of oxygen deficiency or enrichment where an lift is stopped for a certain period between floors, vessels shall not be transported together with persons, unless adequate safety precautions have been taken.

Vehicles used for transport, shall have well ventilated cargo areas and wherever possible separate cargo and passenger compartments. Where this is not possible, or in cases of doubt as to the effectiveness of the ventilation, an atmosphere monitor shall accompany the personnel travelling with the vessel. Vessels should be transported in their correct operating position.

10 Filling

The following operations shall be carried out in accordance with a written procedure.

10.1 Prefill checks

Prior to filling the filler shall examine the condition of the vessel as indicated in table 1.

Table 1 — Prefill checks

	Acceptance criteria for filling
Data plate	Present, legible and in accordance with 4.1
Inspection date	Within required period
Product identification labels	Fitted and legible
Vessel and accessories	No obvious signs of damage, corrosion, dirt, oil or grease ; no excessive ice
Manual valves	Operable
Safety relief devices	In place, free from ice or other obstructions
Filling connection	Correct connection fitted for product and cap-fitted if required
Pressure gauge	Positive pressure in vessel
Connections	Free from dirt, oil or grease and free from water or excessive oil

The vessel shall not be filled if any of these acceptance criteria cannot be met. Prior to filling all non-compliances shall be corrected.

10.2 Preparations

Depending on the type of the cryogenic vessel, it may be filled by volume or by weight, taking into account product density. The necessary measuring equipment shall be in good working order and within the calibration period.

If there is no residual pressure in the vessel prior to filling it should be purged to remove possible contaminants. For carbon dioxide vessels, only gaseous carbon dioxide should be used for purging.

If the vessel is warm, it should be cooled down according to the manufacturer's recommendations. Carbon dioxide vessels shall be pressurized with gaseous carbon dioxide before introducing liquefied gas.

The purity of the residual product in the vessel shall be analyzed and recorded where required by specification. Where the residual purity is outside specification the vessel should be purged until it meets specification.

The fill hose should be purged and cooled down.

Where necessary, the pressure should be reduced by venting to facilitate filling. For carbon dioxide the pressure shall not drop below 5 bar.

10.3 After fill check

The vessel weight or level of contents and pressure shall be checked and, where necessary, the vessel should be vented to reach the level required by specification.

Where required by specification, the vessel contents shall be analyzed and recorded.

The filler should check that all valves are closed, that no cold spots have developed and that valves, piping and fittings are free from leaks.

11 Product withdrawal

The user shall check that the vessel product, pressure and temperature are compatible with the supply system, that the correct hose connection is available and that the vessel is positioned in accordance with manufacturer's recommendations.

Before connecting the vessel for use, the user shall check that backflow from the system into the vessel is not possible and also that liquefied gas cannot become trapped without adequate pressure relief.

Valves shall be opened slowly and shall be closed when not in use.

Flames shall not be used for de-icing frozen valves.

12 Change of service

This operation shall follow a written procedure and the results of the steps involved should be recorded. Such records should be retained by the operating company.

The procedure shall include the following :

- check that the vessel is designed for the intended service. Special attention shall be given to this point if the vessel is intended for oxidizing fluids ;
- depressurization, emptying and disconnecting the vessel shall be performed in accordance with clause 13 ;
- where it is suspected that the vessel may have been contaminated, it shall be cleaned by using a suitable cleaning procedure ;
- the vessel marking, labelling and fittings shall be modified according to the new product ;

If the vessel is intended for oxidizing fluids, the following additional requirements shall be considered :

- the vessel and all piping and accessories shall be purged with inert gas until the outlet temperature is at least close to ambient temperature. The purge gas inlet temperature shall never exceed the maximum operating temperature of the vessel ;
- it shall be verified by suitable methods that the vessel and all piping and accessories are not contaminated by hydrocarbons ;
- before the vessel is filled with an oxidizing fluid a competent person shall verify that the procedure has been carried out correctly.

13 Taking out of service

This operation shall follow a written procedure and the results of the steps involved should be recorded. If the vessel is intended for further service, such records should be retained by the operating company.

The procedure shall include the following :

- depressurization and emptying of the vessel ;
- when depressurizing the vessel, it shall be verified that the valve used for emptying is not obstructed ;
- the procedure shall be checked by monitoring pressure and weight, if necessary ;
- due consideration should be given to the properties of the product involved (e.g. solidification of CO₂).

If the equipment is intended to be taken into service again later, the following additional points shall be considered :

- the purging of the vessel and all piping and accessories with inert gas ;
- if there is a possibility that the vessel could be used for oxidizing fluids at a later time, then the cleaning and hydrocarbon checking steps outlined in clause 12 shall be applied when the vessel is taken out of service ;
- if the vessel is to be transported or stored, protective caps should be fitted on all open connections ;
- when in store, a slight positive pressure of dry inert gas shall be maintained in the vessel and the vessel shall be labelled accordingly.

If the vessel is to be scrapped, it shall be purged with air and labelled accordingly.

14 Maintenance and repair

Maintenance is required to ensure that equipment remains in a safe condition. The responsibility for the maintenance and repair shall be established between the contracting parties (e.g. owner, user, filler). Following maintenance, the vessel shall comply with the current approval documentation.

Maintenance generally comprises :

- checking the condition of the vessel, piping and accessories ;
- checking the operability of valves ;
- minor repairs, e.g. changing of seals ;
- cleaning external surfaces.

Maintenance operations shall only be carried out by personnel trained for the task.

Equipment shall not be removed until all pressure has been released.

Any leakage shall be rectified promptly and in a safe manner. Only original spare parts should be used. If this is not possible the suitability of the spare part shall be approved by a competent person.

Modifications in design, materials and equipment or repairs shall be approved by a competent person and documentation updated accordingly (see also EN 1251-2).

Hot work (welding, soldering, heat treatment etc.) shall be carried out to the same procedures (fabrication, qualification of personnel, testing, certification etc.) as during manufacture.

Vessels shall be internally clean, dry and free from particulate matter and contaminants; vessels for oxidizing fluids shall be free from oil and grease (see EN 12300).

15 Periodic inspection

The inspection shall be performed by a competent inspection body at intervals not exceeding 10 years.

a) equipment and safety device check

Safety valves shall be lift tested either in situ or off the vessel.

Bursting discs where fitted shall be checked for correct installation and rating. If satisfactory they do not require replacement.

All other equipment shall be checked for satisfactory functioning.

b) visual external examination

Check for signs of damage.

Check content and legibility of data plate (see 4.1) and other markings.

c) leak test

Gas test using an inert gas or the working medium at 90 % of the allowable working pressure.

d) in cases of doubt regarding the integrity of the vacuum interspace, an evaporation test or vacuum measurement should be carried out ;

e) in addition, at intervals not exceeding five years :

1) the safety valves shall be lift tested ;

2) the bursting discs shall be visually inspected.

Satisfactory examination shall be confirmed in accordance with EN 1251-1.

16 Additional requirements for flammable gases

16.1 General safety requirements (see also clause 6)

16.1.1 General

Open vessels/dewars shall not be used.

Precautions shall be taken when approaching a leak as the product may ignite and produce a flame. Products such as hydrogen require specific care as the flame is invisible.

Care should be taken in the choice of personnel clothing, to protect as much as possible against static charges and flames. Anti-static footwear shall be worn.

Fill/withdrawal connections shall be capped when not in use.

Spillage of flammable fluids can result in the risk of fire explosion.

16.1.2 Electrical equipment and installation/earthing

All equipment shall be in accordance with the requirements of the hazardous area classification.

All parts of the installation shall be bonded to ensure electrical continuity.

Installations shall be earthed, (resistance $\leq 10\Omega$ ###).

Major items of equipment (e.g. the vessel) shall be bonded directly to the earth point and shall not rely upon the piping as a means to earth.

For transfilling processes, equalisation of the electrical potentials is necessary.

In the classified area personnel shall not be permitted to carry sources of flame, or non-approved electrical equipment. Consideration shall be given to equipment generating electromagnetic waves, e.g. mobile phones and radio transmitters.

16.2 Putting into service (see also clause 7)

Prior to filling a vessel which is empty or depressurised, it shall be purged with an inert gas. Purging shall be continued until the gas within the vessel will not result in a flammable mixture forming during filling with the flammable fluid.

The purge gas shall initially be at a temperature above 0 °C.

16.3 Location (see also clause 8)

Vessels shall not be located underground.

Vessels shall not be filled or stored indoors.

Vessels which are connected to product withdrawal systems should be located outdoors. However, they may be located indoors providing the following requirements are met :

- The maximum quantity of flammable fluid within the vessel is less than 200 l, or between 200 l and 1 000 l providing the vessel is located in a room which has been specifically designed for this purpose.
- Where forced ventilation is provided, appropriate classified equipment shall be used.
- All relief valve outlets and vent valve outlets shall be piped to a safe external venting point. The fire resistance of the materials in the vicinity of the vent discharge shall be considered.
- Gas detectors shall be fitted within the room, set to alarm when 25 % of the lower explosive limit is reached.

For vessels which are located outdoors, safety distances are given in annex B. For vessels which are located indoors, the entire room in which the vessel is located shall be considered a potentially hazardous area and be subject to individual assessment.

16.4 Transport within the location (see also clause 9)

Vessels should not be transported within the location unless the vessel pressure at the start of the journey is less than 50 % of the vessel maximum allowable working pressure and fill connections are capped.

Vessels shall not be transported in elevators or lifts.

Vessels shall not be transported in enclosed passenger or cargo compartments of vehicles.

16.5 Filling (see also clause 10)

If the vessel is empty or depressurised follow the procedure given in 16.2.

Before starting the transfilling, the earthing conductor shall be connected and the filling hose(s) purged free of air and impurities.

Filling shall only be undertaken outdoors.

16.6 Change of service (see also clause 12)

Vessels designed and used for flammable fluid service shall not be transferred to oxidant, or inert gas service, without appropriate purging, cleaning and design parameter verification.

16.7 Taking out of service (see also clause 13)

The vessel shall be purged with inert gas until the flammable gas concentration in the inert gas is below 50 % of the lower explosive limit of flammable gas in air.

16.8 Maintenance and repair (see also clause 14)

Where maintenance and repair work requires the vessels to be inerted, it shall be emptied using a safe procedure and purged with inert gas until the concentration of flammable gas in the inert gas is below 50 % of the lower explosive limit of the flammable gas in air.

16.9 Periodic inspection (see also clause 15)

At intervals not exceeding 3 years the vessel safety valves shall be lift tested.

17 Emergency equipment/procedures

Emergency procedures shall be prepared to cover fire or any other hazardous events, e.g. spills, which can occur. It is advisable that emergency procedures are prepared in conjunction with the emergency services and that local conditions are considered.

The procedure shall consider the following :

- the properties of the cryogenic fluids ;
- the quantities involved ;
- the local topography ;
- the design of the vessel.

The procedure should include :

- listing of emergency equipment required ;
- nomination of back-up personnel/organisations for managing emergencies and procedures for contacting them both during and outside working hours ;
- immediate self-help actions required (shut down, sounding alarms, evacuation from the area, summoning help, etc.).

The procedures should be readily available to all personnel involved, regularly practised and checked periodically that they are up to date.

As a minimum, fire fighting equipment should consist of one suitable fire extinguisher. If water is used to keep equipment cool in the event of fire, it should not be sprayed near relief device vents, because of the potential danger of plugging vents with ice.

An example of an emergency procedure is given in annex A.

Annex A **(informative)** **Example of an emergency procedure**

<u>Product</u>	- non-flammable, non toxic, cryogenic fluid - colourless, odourless
<u>Hazards</u>	- liquid has very low temperature and evaporates readily - cold gas is heavier than air and spreads along the ground - cold gas is invisible but produces mist in contact with atmospheric moisture - the gas will suffocate without warning - contact with liquid causes cold burns and severe damage to eyes - heating the vessel will cause a pressure rise with a risk of the vessel bursting
<u>Protective clothing</u>	- safety goggles, shoes and gloves
<u>Equipment</u>	- oxygen analyzer - breathing apparatus
<u>Fire fighting equipment</u>	- extinguisher (CO₂, dry chemical) - water
<u>Emergency action</u>	- raise the alarm - evacuate all persons from the immediate danger area - notify fire brigade immediately (if necessary) - isolate the area - place warning signs - keep upwind (outdoors) - in case of leakage/spillage: - tighten up leaks if this can be done without risk - allow liquid to evaporate - prevent liquid entering sewers, pits, trenches - in case of fire: - keep vessel cool by spraying with water - do not spray water directly on valves or safety equipment - move the vessel to a safe location if possible
<u>First aid</u>	- get medical assistance if symptoms of inhalation are noticed or there has been product contact with skin or eyes - in case of contact with liquid, first thaw affected parts with water then remove clothing carefully
<u>Emergency telephone numbers</u>	
Fire brigade:	
Supervisor:	
Hospital/Physician	

Annex B (informative) Safety distance

Table B.1 — Safety distances

Type of exposure	Safety distance (m)		
	Inert fluid	Oxidising fluid	Flammable fluid
Site boundary, vehicle parking areas, public road/railway lines	1	2	5
Area where open flames, smoking or sources of ignition are permitted	1	3	5
Stocks of combustible materials, e.g. timber, including wooden buildings and structures	-	3	3
Pits, ducts, surface water drains, openings of systems below ground level	1	3	3
Offices, canteens and areas where employees/visitors are likely to congregate	3	5	5
Compressors/ventilator air intakes	1	5	5
Bulk flammable liquids and LPG storage	3	5	5

Annex C (informative)

Qualification of existing national small transportable cryogenic vessels for use in the European union

C.1 Scope

This annex defines those checks, inspections and tests which shall be performed in order to qualify existing national small transportable cryogenic vessels to ensure their compliance with the ADR/RID technical provisions for free movement and use within all member states of the European Union.

C.2 Normative references

This annex 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 annex only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1251-1, *Cryogenic vessels – Transportable vacuum insulated vessels of not more than 1 000 litres volume - Part 1: Fundamental requirements*

EN 1251-2, *Cryogenic vessels – Transportable vacuum insulated vessels of not more than 1 000 litres volume - Part 2: Design, fabrication, inspection and testing*

C.3 Symbols

π is the official stamp mark required by the TPED to certify existing conforming to ADR for use through the European Union.

C.4 General requirements

C.4.1 The owner/user of the transportable cryogenic vessels shall indicate to the periodic inspection body the types and the number of transportable cryogenic vessels presented for qualification.

For each of the transportable cryogenic vessel the following data shall be documented :

- manufacturer ;
- serial number(s) ;
- date of manufacture ;
- regulation to which the transportable cryogenic vessels were designed and manufactured ;
- working pressure ;
- test pressure ;
- diameter of the inner vessel ;
- minimum wall thickness of the inner vessel ;

- water capacity ;
- product(s) for which the transportable cryogenic vessel is designed and manufactured.

The inspection body shall verify that this list contains all necessary information to clearly define the transportable cryogenic vessels.

C.4.2 The inspection body shall verify that the wall thickness of the transportable cryogenic vessels is equal to or greater than the minimum wall thickness as calculated in accordance with EN 1251-2.

C.4.3 The inspection body shall verify that valid certificates concerning manufacturing, material and tests are available.

C.4.4 The inspection body shall perform the periodic inspection in accordance with EN 1251-3.

C.5 Markings

C.5.1 A transportable cryogenic vessel passing the periodic inspection can only be stamped with the mark "Pi" provided that the general requirements of C.4 have been fully verified.

C.5.2 To avoid any confusion in the new countries of use the transportable cryogenic vessels shall be marked :

- either in accordance with EN 1251-1 ;
- or in accordance with the authorised marking of the new country of use and fulfilling ADR requirements.

C.6 Inspection report

The authorised inspection body shall prepare an inspection report for each type of small transportable cryogenic vessels and confirm compliance with the relevant requirements.

Annex D (informative) A-deviations

A- deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN/ CENELEC member. This European Standard falls under Directive 94/55/CE and 96/49/CE.

NOTE (from CEN/ CENELEC Internal Regulations Part 2: 1994, 3.1.9): Where standards fall under EU Directives, it is the view of the Commission of the European Communities (OJ No C 59, 9.3.1982) that the effect of the decision of the Court of Justice in case 815/ 79 Cremonini/ Vrankovich (European Court Reports 1980, p. 3583) is that compliance with A- deviations is no longer mandatory and that the free movement of products complying with such a standard should not be restricted within the EU except under the safeguard procedure provided for in the relevant Directive.

Sweden :

In application of the following national regulations :

Act on Explosives and Flammables : SFS 1998:868 ;

Ordinance on Explosives and Flammables : SFS 1988:1145 ;

Regulations on Handling of Flammable Gases and Liquids in connection to certain transportation : SÄIFS 1990:2 ;

Regulations on Classification of Hazardous areas : SÄIFS 1996:6 ;

Regulations on Handling of Vessels with Flammable Gases : SÄIFS 1997:6;

The following clauses shall be changed :

Clause	Modification in Sweden	
8	The vessel may not be placed on a flammable surface, e.g. asphalt.	
10.1	The vessel must have a connection for cable against difference of potential tightly fastened.	
14	The user is responsible for the maintenance.	
16.1.2 last indent	Mobile phones and radios shall meet the requirements of hazardous area classification.	
16.3	Vessels are to have safety distances regardless of being indoors or outdoors.	
16.7	The allowable limit is to be only 25 % of the lower explosion limit.	
16.8	The allowable limit is to be only 25 % of the lower explosion limit.	
Annex B	The last column of the table shall read :	
	Flammable fluid	
	6	
	6	
	25	
	3	
	6	
	6	
	25	