SLOVENSKI STANDARD
SIST EN 1251-1:2001

01-januar-2001

Kriogene posode - Premiļne vakuumsko izolirane posode s prostornino, ki ni veļja od 1 000 litrov - 1. del: Osnovne zahteve

Cryogenic vessels - Transportable vacuum insulated vessels of not more than 1000 litres volume - Part 1: Fundamental requirements

Kryo-Behälter - Orstbewegliche, vakuumisolierte Behälter mit einem Fassungsraum von nicht mehr als 1000 Liter - Teil 1: Grundanforderungen

Récipients cryogéniques - Récipients transportables, isolés sous vide, d'un volume n'excédant pas 1000 litres - Partie 1: Exigences fondamentales

Ta slovenski standard je istoveten z: **EN 1251-1:2000**

ICS:

23.020.40	Proti mrazu odporne posode (kriogenske posode)	Cryogenic vessels

SIST EN 1251-1:2001 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1251-1

January 2000

ICS 23.020.40

English version

Cryogenic vessels - Transportable vacuum insulated vessels of not more than 1000 litres volume - Part 1: Fundamental requirements

Récipients cryogéniques - Récipients transportables, isolés sous vide, d'un volume n'excédant pas 1000 litres - Partie 1: Exigences fondamentales

Kryo-Behälter - Ortsbewegliche, vakuum-isolierte Behälter mit einem Fassungsraum von nicht mehr als 1000 Liter - Teil 1: Grundanforderungen

This European Standard was approved by CEN on 19 June 1999.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. 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.

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 Central Secretariat 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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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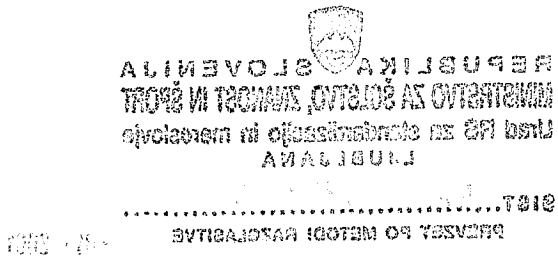

Foreword

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 2 : Design, fabrication, inspection and testing ;

— Part 3 : Operational requirements.

1 Scope

This standard specifies the fundamental requirements for transportable vacuum insulated cryogenic vessels of not more than 1 000 litres volume and designed to operate above atmospheric pressure. Appropriate parts may be used as a guidance for vessels designed to operate to the atmosphere.

This standard applies to transportable vacuum insulated cryogenic vessels for fluids as specified in 3.1 and is not applicable to such vessels designed for toxic fluids.

NOTE For the purposes of this standards, in the English and German versions, "cryogenic vessels" and "Tiefkalte Behälter" mean reciprocating "cryogenic receptacles" and "Kryo-Behälter" as defined in RID/ADR.

2 Normative references

This European Standard incorporates by dated or undated references provisions from other publications. These normative references are cited at 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 1251-2, *Cryogenic vessels - Transportable vacuum insulated vessels of not more than 1 000 litres volume - Part 2 : Design, fabrication, inspection and testing*

EN 1251-3, *Cryogenic vessels - Transportable vacuum insulated vessels of not more than 1 000 litres volume - Part 3 : Operational requirements*

EN 1252-1, *Cryogenic vessels - Materials - Part 1: Mechanical characteristics for temperature below - 80 C*

EN 1626, *Cryogenic vessels - Valves for cryogenic service*

EN 1797-1, *Cryogenic vessels - Gas/material compatibility - Part 1: Oxygen compatibility*

EN 10204, *Metallic products - Types of inspection documents*

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

3 Definitions

For the purposes of this standard, the following definitions apply :

3.1
cryogenic fluid (refrigerated liquefied gas)
a gas which is partially liquid because of its low temperature[1)].In the context of all parts of prEN 1251 the (refrigerated but) non-toxic gases given in table 1 and mixtures of them are referred to as cryogenic fluids.

[1)] This includes totally evaporated liquids and supercritical fluids.

Table 1 : Refrigerated but non-toxic gases

Item and group	Identification number, name and description [1]	
3° A	Asphyxiant gases	
	1913	Neon, refrigerated liquid
	1951	Argon, refrigerated liquid
	1963	Helium, refrigerated liquid
	1970	Krypton, refrigerated liquid
	1977	Nitrogen , refrigerated liquid
	2187	Carbon dioxide, refrigerated liquid
	2591	Xenon, refrigerated liquid
	3136	Trifluoromethane, refrigerated liquid
	3158	Gas, refrigerated liquid, N.O.S. [2]
3° O	Oxidizing gases	
	1003	Air, refrigerated liquid
	1073	Oxygen, refrigerated liquid
	2201	Nitrous oxide, refrigerated liquid
	3311	Gas, refrigerated liquid, oxidizing, N.O.S [2]
3° F	Flammable gases	
	1038	Ethylene, refrigerated liquid
	1961	Ethane, refrigerated liquid
	1966	Hydrogen, refrigerated liquid
	1972	Methane, refrigerated liquid or natural gas, refrigerated liquid, with high methane content
	3138	Ethylene, acetylene and propylene mixture, refrigerated liquid, containing at least 71,5 % ethylene with not more than 22,5 % acetylene and not more than 6 % propylene
	3312	Gas, refrigerated liquid, flammable, N.O.S [2]

1) Item group, identification number, name and description according to ADR '97

2) N.O.S. = not otherwise specified

3.2
transportable cryogenic vessel
a thermally insulated vessel intended for the transport of one or more cryogenic fluids, consisting of an inner vessel, an outer jacket, all of the valves and equipment together with any additional framework. This transportable cryogenic vessel represents a complete assembly ready for putting into service

3.3
thermal insulation
a vacuum interspace between the inner vessel and the outer jacket. The space may or may not be filled with material to reduce the heat transfer between the inner vessel and the outer jacket

3.4
inner vessel
the vessel intended to contain the cryogenic fluid

3.5
outer jacket
the gas-tight enclosure which contains the inner vessel and enables the vacuum to be established

3.6
normal operation
the intended operation of the vessel at maximum allowable pressure including the handling loads defined in 3.7

3.7
handling loads
the loads exerted on the transportable cryogenic vessel in all expected situations of transport including loading, unloading, moving by hand or fork lift truck

3.8
documentation
technical documents delivered by the manufacturer to the owner consisting of :

— all certificates establishing the conformity with this standard (e.g. material, pressure test, cleanliness, safety devices) ;

— a short description of the vessel (including characteristic data, etc.) ;

— a list of fluids and their net mass for which the cryogenic vessel is designed ;

— an operating manual (for the user) which consists of :

1) a short description of the vessel (including characteristic data, etc.) ;

2) a statement that the vessel is in conformity with this standard and

3) the instructions for normal operation

3.9
piping system
all pipes which can come in contact with cryogenic fluids including their valves, fittings, pressure relief devices as well as their supports

3.10
equipment
device which have a safety related function with respect to pressure containment and/or control (e.g. protective or limiting devices, regulating and monitoring devices, valves, indicators)

3.11
manufacturer of the transportable cryogenic vessel
the company which carries out the final assembly of the transportable cryogenic vessel

3.12
volume of the inner vessel
the volume of the shell, excluding nozzles, pipes etc. determined at minimum design temperature and atmospheric pressure

3.13
tare mass
the mass of the empty transportable cryogenic vessel

3.14
net mass
the maximum allowable mass of the cryogenic fluid which may be filled

3.15
gross mass
the sum of tare mass plus net mass

3.16
pressure
a pressure relative to atmospheric pressure, i.e. gauge pressure. As a consequence, vacuum is designated by a negative value.

4 General requirements

The transportable cryogenic vessel shall safely withstand the mechanical and thermal loads and the chemical effects encountered during pressure test and normal operation. These requirements are deemed to be satisfied if clauses 5 to 9 are fulfilled. The vessel shall be marked in accordance with clause 10, tested in accordance with clauses 11 and 12 and operated in accordance with EN 1251-3.

5 Mechanical loads

5.1 General

The transportable cryogenic vessel shall resist the mechanical loads mentioned in clause 4 without such deformation which could affect safety and which could lead to leakage. This requirement can be validated by :

— calculation ;

— experimental method ;

— calculation and experimental method

in accordance with prEN 1251-2.

The mechanical loads to be considered are given in 5.2 and 5.3.

5.2 Load during the pressure test

The loads exerted during the pressure test is :

$$P_t \geq 1{,}3(P_s + 1) \text{ bar}$$

where :

P_t is the test pressure (in bar) ;

P_s is the maximum allowable pressure (= relief device set pressure) (in bar) ;

+ 1 is the allowance for external vacuum (in bar).

5.3 Other mechanical loads

5.3.1 The following loads shall be considered to act in combination where relevant :

— a pressure equal to the maximum allowable pressure in the inner vessel and pipework ;

— the pressure exerted by the liquid when filled to capacity ;

— loads produced by the thermal movement of the inner vessel, outer jacket and interspace piping ;

— loads imposed in lifting and handling fixtures (at the vessel) ;

— full vacuum in the outer jacket ;