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I.S. EN 13648-1:2008

# Cryogenic vessels - Safety devices for protection against excessive pressure - Part 1: Safety valves for cryogenic service

## I.S. EN 13648-1:2008

*Incorporating amendments/corrigenda issued since publication:*

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English Version

## Cryogenic vessels - Safety devices for protection against excessive pressure - Part 1: Safety valves for cryogenic service

Réceptifs cryogéniques - Dispositifs de protection contre les surpressions - Partie 1: Soupapes de sûreté pour service cryogénique

Kryo-Behälter - Sicherheitseinrichtungen gegen Drucküberschreitung - Teil 1: Sicherheitsventile für den Kryo-Betrieb

This European Standard was approved by CEN on 5 October 2008.

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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 CEN Management Centre has the same status as the official versions.

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## **Foreword**

This document (EN 13648-1:2008) 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of an identical text or by endorsement, at the latest by May 2009, and conflicting national standards shall be withdrawn at the latest by May 2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13648-1:2002.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EC Directive(s) 97/23/EC.

For relationship with EC Directive(s), see informative Annex ZA, which is an integral part of this document.

This European Standard is composed of the following Parts:

EN 13648-1, *Cryogenic vessels – Safety devices for protection against excessive pressure – Part 1: Safety valves for cryogenic service;*

EN 13648-2, *Cryogenic vessels – Safety devices for protection against excessive pressure – Part 2: Bursting disc safety devices for cryogenic service;*

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

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

## 1 Scope

This European Standard specifies the requirements for the design, manufacture and testing of safety valves for cryogenic service, that is to say for operation with cryogenic fluids (as defined in EN 1251-1) below  $-10\text{ }^{\circ}\text{C}$  in addition to operation at ambient temperature. It is a requirement of this European Standard that the valves comply with EN ISO 4126-1 or EN ISO 4126-4. In the event of different requirements, the requirements for cryogenic service are applied.

NOTE 1 A cryogenic fluid (refrigerated liquefied gas) is a gas which is partially liquid because of its low temperature (including totally evaporated liquids and supercritical fluids).

This European Standard is restricted to valves not exceeding a size of DN 100 for category B. The valves of category A are limited to DN 25 and set pressures up to 40 bars. Both categories are designed to relieve single phase vapours or gases. A valve can be specified, constructed and tested such that it is suitable for use with more than one gas or with mixtures of gases.

NOTE 2 All safety valves covered in this European Standard correspond to category IV of PED (Directive 97/23/EC) and category 3 of TPED (Directive 99/36/EC).

NOTE 3 This European Standard does not provide methods for determining the capacity of relief valve(s) for a particular cryogenic vessel. Such methods are provided in EN 13648-3.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1252-1, *Cryogenic vessels – Materials – Part 1: Toughness requirements for temperatures below  $-80\text{ }^{\circ}\text{C}$*

EN 1252-2, *Cryogenic vessels – Materials – Part 2: Toughness requirements for temperatures between  $-80\text{ }^{\circ}\text{C}$  and  $-20\text{ }^{\circ}\text{C}$*

EN 1797, *Cryogenic vessels – Gas/material compatibility*

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

EN ISO 4126-1:2004, *Safety devices for protection against excessive pressure – Part 1: Safety valves (ISO 4126-1:2004)*

EN ISO 4126-4:2004, *Safety devices for protection against excessive pressure – Part 4: Pilot operated safety valves (ISO 4126-4:2004)*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### **DN (nominal size)**

alphanumeric designation of size for components of a pipework system, which is used for reference purposes and which comprises the letters DN followed by a dimensionless whole number that is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections

[adapted from EN ISO 6708:1995]

### 3.2

#### **pressure**

gauge pressure that is the value which is equal to the algebraic difference between the absolute pressure and the atmospheric pressure

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