

**Krüogeenanumad. Materjalid. Osa 2:  
Vastupidavusnõuded temperatuuridel  
vahemikus -80°C ja -20°C**

Cryogenic vessels - Materials - Part 2: Toughness  
requirements for temperatures between -80 °C and  
-20 °C

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 1252-2:2005 sisaldab Euroopa standardi EN 1252-2:2001 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 15.07.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 1252-2:2005 consists of the English text of the European standard EN 1252-2:2001.</p> <p>This document is endorsed on 15.07.2005 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b> This European Standard specifies the toughness requirements of the metallic materials for use at a temperature between -20°C and -80°C ensuring suitability for use for the cryogenic vessels.</p>	<p><b>Scope:</b> This European Standard specifies the toughness requirements of the metallic materials for use at a temperature between -20°C and -80°C ensuring suitability for use for the cryogenic vessels.</p>
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English version

**Cryogenic vessels - Materials - Part 2: Toughness requirements  
for temperatures between -80 °C and -20 °C**

This European Standard was approved by CEN on 19 January 2001.

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 Management Centre 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 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, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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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 October 2001, and conflicting national standards shall be withdrawn at the latest by October 2001.

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

This document also supports the objectives of the framework Directives on Transport of Dangerous Goods. This standard has been submitted for reference into the RID and/or 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 document are normative only when the standards themselves are referred to in the RID and/or in the technical annexes of the ADR.

This European Standard is composed of the following parts :

- |           |  |
|-----------|--|
| EN 1252-1 | Cryogenic vessels - Materials - Part 1: Toughness requirements for temperatures below - 80 °C              |
| EN 1252-2 | Cryogenic vessels - Materials - Part 2 : Toughness requirements for temperatures between - 80°C and - 20°C |

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.

## Introduction

The use of materials at low temperatures entails special problems which have to be addressed. Consideration has to be given, in particular, to changes in mechanical characteristics, expansion and contraction phenomena and the thermal conduction of the various materials. The most important property to be considered is the material toughness at low temperature.

## 1 Scope

This European Standard specifies the toughness requirements of the metallic materials for use at a temperature between - 80 °C and - 20 °C ensuring suitability for use for the cryogenic vessels.

Fine grain and low alloyed steels with specified yield strength  $\leq 460$  N/mm<sup>2</sup>, aluminium and aluminium alloys, copper and copper alloys and austenitic stainless steels are covered by this standard.

## 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 10045-1, *Metallic materials - Charpy impact test - Part 1 : Test method*

EN 288-3 :1992, A1 :1997, *Specification and approval of welding procedures for metallic materials - Part 3 : Welding procedure tests for the arc welding of steels*

## 3 Terms and definitions

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

### 3.1

#### **minimum metal temperature $T_M$**

the lowest temperature defined for each of the following conditions (see also 3.2 and 3.3) :

- temperature during normal operations ;
- temperature during start up and shut down procedures ;
- temperature which may occur during possible process upsets ;
- temperature which may occur during pressure or leak testing.

### 3.2

#### **temperature adjustment term $T_S$**

term relevant to the calculation of the design reference temperature  $T_R$  and dependent on the pressure induced principal membrane stress at the appropriate minimum metal temperature.