

Cryogenic vessels — Cryogenic flexible hoses

The European Standard EN 12434:2000 has the status of a
British Standard

ICS 23.020.40; 23.040.70

Confirmed March 2008

National foreword

This British Standard is the official English language version of EN 12434:2000, including Corrigendum February 2001.

The UK participation in its preparation was entrusted to Technical Committee PSE/18, Cryogenic vessels, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

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This British Standard, having been prepared under the direction of the Engineering Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 15 October 2000

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 18, an inside back cover and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments
14115 Corrigendum No. 1	4 October 2002	Correction to the technical committee details cited in the EN foreword

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ISBN 0 580 36420 8

English version

Cryogenic vessels - Cryogenic flexible hoses

Réceptacles cryogéniques - Tuyaux flexibles cryogéniques

Kryo-Behälter - Kryoschlauchleitungen

This European Standard was approved by CEN on 7 July 2000.

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.



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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 BSI.

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 February 2001, and conflicting national standards shall be withdrawn at the latest by February 2001.

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

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

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.

1 Scope

This standard gives design, construction, type and production testing, and marking requirements for non insulated cryogenic flexible hose used for the transfer of cryogenic fluids within the following range of operating conditions :

- working temperature: from - 270 °C to + 65 °C ;
- maximum nominal pressure: 80 bar ;
- nominal size (DN): from 10 to 100.

End fittings for mounting of any couplings are within the scope of this standard, but the couplings are subject to other standards.

It is intended that the hose be designed and tested to satisfy the generally accepted nominal pressure e.g. PN 40. Hoses may then be selected with a PN equal to or greater than the maximum allowable pressure (PS) of the equipment to which it is to be used.

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

EN 1333, Pipework components - Definition and selection of PN

EN 1797-1, Cryogenic vessels - Gas/materials compatibility - Oxygen compatibility

EN 12300, Cryogenic vessels - Cleanliness for cryogenic service

EN ISO 6708, Pipework components - Definition and selection of DN (nominal size) (ISO 6708:1995)

ISO 7369:1995, Pipework - Flexible metallic hoses - Vocabulary of general terms

3 Terms and definitions

For the purposes of this Standard, in addition to those given in ISO 7369:1995, the following terms and definitions apply :

3.1 hose

A flexible leak tight inner tube either corrugated metal, elastomer or plastic.

3.2 braid

A layer, or layers, of cylindrically woven wires covering the hose and attached to the flexible hose assembly end fittings, serving the function of restraining the flexible hose against elongation.

3.3 protection coil or cover

An outer coil or cover fitted to protect the main hose and braid against damage and abrasion.

3.4

end fitting

A fitting (of material compatible with material and product transferred) attached to each end of the hose and braid (when fitted).

3.5

hose assembly

A hose with end fittings attached, complete with braid and/or other covering, ready for service.

3.6

nominal size (DN)

As defined in EN ISO 6708.

3.7

nominal pressure (PN)

As defined in EN 1333.

NOTE 1 $PN \geq PS$ (as defined in PED)

NOTE 2 See also the last sentence of the scope.

3.8

working temperature range

The highest and lowest temperature to which the hose assembly is to be subjected.

3.9

cyclic life

Minimum number of complete cycles which, at the test conditions, the hose assembly is designed to withstand without failure.

4 General requirements

4.1 Design and construction

The nominal pressure used during tests (see clause 5) shall be greater than or equal to the nominal pressure (PN) specified. In addition, the nominal pressure (PN) shall not be less than the maximum allowable pressure (PS) of the equipment to which it is to be used. A hose is typically made from corrugated metal, from strip steel. The corrugation may be parallel or helicoil. The nominal pressure stamped on the hose assembly shall be greater than or equal to the maximum pressure in service.

If elastomers or composites are used, additional requirements shall be applied in accordance with 5.3.2.2.

A braid is commonly fitted over the inner tube. This, generally, consists of woven wire in one or two layers, in stainless steel or a high strength copper alloy. It may have a cover, which shall be compatible with the surroundings and, normally, with the conveyed fluid.

The design shall ensure that pressurisation, or corrosion, between the inner tube and the outer braid or sheath is prevented.

End fittings shall be designed as a rigid seal to the ends of a hose to ensure :

- a tight fixing to the hose ;
- a strong joint between the braid and hose to stabilise the hose against elongation at nominal pressure.

An area for marking shall be provided on one of the end fittings.

A typical cryogenic hose assembly is shown in annex A.