SLOVENSKI STANDARD
SIST EN 1763-1:2001

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Gumeni in polimerni cevovodi, cevi in priključki za uporabo trgovskega propana, butana in njunih mešanic v parni fazi - 1. del: Zahteve za gumene in polimerne cevovode in cevi

Rubber and plastics tubing, hoses and assemblies for use with commercial propane, commercial butane and their mixtures in the vapour phase - Part 1: Requirements for rubber and plastics tubing and hoses

Gummi- und Kunststoffschläuche und -schlauchleitungen mit und ohne Einlagen zur Verwendung mit kommerziellem Propan, kommerziellem Butan und ihren Mischungen in der Gasphase -Teil 1: Anforderungen an Gummi- und Kunststoffschläuche mit und ohne Einlagen

Tubes, tuyaux et flexibles en caoutchouc et en plastique pour le propane commercial, le butane commercial et leurs mélanges en phase vapeur - Partie 1: Exigences relatives aux tubes et tuyaux en caoutchouc et en plastique

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This European Standard was approved by CEN on 24 December 1999.

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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 Management Centre has the same status as the official versions.

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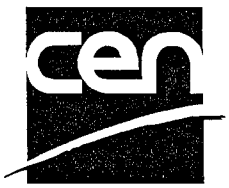

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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 218 "Rubber and plastics hoses and hose assemblies", 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of an identical text or by endorsement, at the latest by June 2001, and conflicting national standards shall be withdrawn at the latest by June 2001.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).

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.

WARNING Due to regulations which are at the time outside the competence of the CEN/CENELEC members (France, Sweden and Italy), this European Standard contains an A-deviation, detailed in annex A (informative).

1 Scope

This European Standard specifies the properties and performance requirements for flexible rubber and plastics tubing and hoses up to a nominal bore of 12,5 for use with commercial propane and butane and mixtures thereof in the vapour phase in appliances, in environments between a minimum ambient temperature of -30 °C and a maximum ambient temperature of +60 °C.

The tests detailed in this standard are also applicable to tubing and hoses which form part of an assembly, such as that used for connecting a cylinder to a regulator.

NOTE 1 Attention is drawn to Part 2 of this standard for details of nipples, couplings and assemblies.

NOTE 2 Flexible rubber and plastics tubing and hoses conforming to this standard may be used where contact with appliances having a maximum surface temperature of 90 °C may occur.

This European Standard does not apply to hoses for welding purposes.

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 ISO 176, *Plastics — Determination of loss of plasticizers — Activated carbon method* (ISO 176:1976)

EN ISO 4671, *Rubber and plastics hose and hose assemblies — Methods of measurement of dimensions* (ISO 4671:1984)

EN ISO 4672, *Rubber and plastics hoses — Sub-ambient temperature flexibility tests* (ISO 4672:1988)

EN ISO 7326, *Rubber and plastics hoses — Assessment of ozone resistance under static conditions* (ISO 7326:1991)

EN ISO 8033, *Rubber and plastics hose — Determination of adhesion between components* (ISO 8033:1991)

ISO 1307, *Rubber and plastics hoses for general-purpose industrial applications — Bore diameters and tolerances and tolerances on length* (ISO 1307:1992)

EN ISO 1402, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing* (ISO 1402:1994)

EN ISO 4080, *Rubber and plastics hoses and hose assemblies — Determination of permeability to gas* (ISO 4080:1991)

EN ISO 11758, *Rubber and plastics hoses —Exposure to a xenon arc lamp — Determination of changes in colour and appearance* (ISO 11758:1995)

ISO 37, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 8330, *Rubber and plastics hoses and hose assemblies — Vocabulary*

3 Terms and definitions

For the purposes of this standard the following definitions and those in ISO 8330 apply.

3.1
commercial butane
hydrocarbon product composed predominantly of butanes and/or butenes; the remaining part may consist mainly of propane/propene and pentane/pentane isomers

3.2
commercial propene
hydrocarbon product composed predominantly of propane and/or propene; the remaining part may consist mainly of ethane/ethene and butane/butene isomers

4 Classification

One class of tubing and three classes of hose are specified, the characteristics being given in Table 1.

Table 1 — Classification of tubing and hoses

Class	Working pressure bar[1)]	Temperature °C		Reinforced	Permeation requirement mL/m/h
		Minimum	Maximum		
1 (tubing)	0,2	-10	60	No	≤ 15
2 (hose)	10	-20	60	Yes	≤ 25
3 (hose)	20	-20	60	Yes	≤ 25
4 (hose) (for outdoor use only)	20	-30	60	Yes	≤ 75

[1)] 1 bar = 0,1 MPa.

5 Construction

5.1 The hose shall contain a lining, cover and a reinforcement of natural or synthetic fibres applied either spirally wound or braided.

5.2 When inspected in accordance with **9.1,** the tubing or hose shall be free from visible defects.

5.3 Pricking of the hose cover shall not constitute a defect.

6 Dimensions

6.1 Internal diameters

When measured in accordance with **9.3**, the internal diameters, tolerances and concentricity shall conform to the values given in Table 2.

Table 2 — Nominal and internal diameter of hose or tubing

Dimensions in millimetres

Nominal and internal diameters	3,2	4,0	5,0	6,3	8,0	9,0	10,0	10,5	12,5
Tolerance	± 0,3	± 0,4	± 0,4	± 0,4	± 0,5	± 0,5	± 0,5	± 0,5	± 0,5
Maximum variation in concentricity	0,3	0,4	0,4	0,4	0,5	0,5	0,5	0,5	0,5

6.2 Tolerance on outside diameter

When two measurements at 90° to each other are made at both ends of all test pieces (see **9.3**), the overall outside diameter of the tubing or hose shall be within ± 5 % of the nominal dimension stated by the manufacturer.

6.3 Tolerance on lengths

The tolerances on lengths of tubing or hoses shall be as given in EN ISO 1307.

7 Requirements of materials

7.1 Preparation of test pieces

Test pieces of thickness (2 ± 0,2) mm shall be cut from sheets of the material for tensile testing and ageing and from the tubing or hose itself for resistance to pentane test.

Sheet materials shall be from the same compound formulation as that used in the tubing or hose . These sheet materials shall be vulcanized or produced under conditions that are comparable to those used in the production of the tubings or hoses.

7.2 Properties of materials for lining and cover

7.2.1 *Tensile strength and elongation at break*

When tested in accordance with **9.4**, the materials used for tubing, lining and cover shall conform to the values given in Table 3.

Table 3 — Requirements for tensile strength and elongation at break

Class	Component	Tensile strength N/mm^2, min.	Elongation at break, in %, min.
1	tubing	7,0	250
2, 3, 4	lining	7,0	250
2, 3, 4	cover	7,0	250

7.2.2 *Accelerated ageing*

After ageing in accordance with ISO 188, using the normal air oven and conditions given in Table 4, materials used for tubing, lining and cover shall conform to the values given in Table 4.

Table 4 — Requirements for accelerated ageing

Class	Test duration, days	Test temperature, °C	Deviation from original values, max.	
			Tensile strength	Elongation at break
1	14	70	25 %	50 %
2	14	70	25 %	35 %
3	14	70	25 %	35 %
4	14	70	25 %	35 %

7.2.3 *Resistance to n-pentane*

When tested in accordance with **9.5**, samples of the lining or tubing shall have an absorption of n-pentane not exceeding 10 % and an extraction of material by n-pentane not exceeding 8 % (*m/m*).

8 Performance requirements of tubing and hoses

8.1 Pressure requirements

When tested in accordance with EN ISO 1402, using air or water for the working and proof pressure, and water as the fluid medium for the minimum burst pressure, the tubing or hose shall conform to the values given in Table 5.