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**Gumene cevi in cevni priključki za utekočinjeni propan/butan (tekoča ali plinska faza) in zemeljski plin do 25 barov (2,5 MPa) - Specifikacija**

Rubber hoses and hose assemblies for liquefied petroleum gas, LPG (liquid or gaseous phase), and natural gas up to 25 bar (2,5 MPa) - Specification

Gummischläuche und -schlauchleitungen für Flüssiggas LPG (flüssig oder gasförmig) und Erdgas bis 25 bar (2,5 MPa) - Spezifikation

Tuyaux et flexibles en caoutchouc pour le gaz de pétrole liquéfié GPL (en phase liquide ou gazeuse) et le gaz naturel jusqu'à 25 bar (2,5 MPa) - Spécification

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English version

## Rubber hoses and hose assemblies for liquefied petroleum gas, LPG (liquid or gaseous phase), and natural gas up to 25 bar (2,5 MPa) - Specification

Tuyaux et flexibles en caoutchouc pour le gaz de pétrole  
liquéfié GPL (en phase liquide ou gazeuse) et le gaz  
naturel jusqu'à 25 bar (2,5 MPa) - Spécification

Gummischläuche und -schlauchleitungen für Flüssiggas  
LPG (flüssig oder gasförmig) und Erdgas bis 25 bar (2,5  
MPa) - Spezifikation

This European Standard was approved by CEN on 18 September 1997.

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.

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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 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of an identical text or by endorsement, at the latest by April 1998, and conflicting national standards shall be withdrawn at the latest by April 1998.

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.

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## 1 Scope

This European Standard specifies the requirements for rubber hoses and rubber hose assemblies used for the transfer of liquefied petroleum gas (LPG) in liquid or gaseous phase and natural gas with a maximum working pressure of 25 bar (2,5 MPa) and vacuum within the temperature range of -30 °C to +70 °C and, when designated -LT, -50 °C to +70 °C.

## 2 Normative references

This European Standard incorporates by dated or undated references, 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 by amendment or revision. For undated references latest edition of the publication referred to applies.

EN 21746	Rubber or plastics hoses and tubing - Bending tests (ISO 1746 : 1983)
EN 24671	Rubber and plastics hoses and hose assemblies - Methods of measurement of dimensions (ISO 4671 : 1984)
EN 24672	Rubber and plastics hoses - Sub-ambient temperature flexibility tests (ISO 4672 : 1988)
EN 27326	Rubber and plastics hoses - Assessment of ozone resistance under static conditions (ISO 7326 : 1991)
EN 28031	Rubber and plastics hoses and hose assemblies - Determination of electrical resistance (ISO 8031 : 1987)
EN 28033	Rubber and plastics hose - Determination of adhesion between components (ISO 8033 : 1991)
EN ISO 1402	Rubber and plastics hoses and hose assemblies - Hydrostatic testing (ISO 1402 : 1994)
EN ISO 7233	Rubber and plastics hoses and hose assemblies - Determination of suction resistance (ISO 7233 : 1991)
ISO 37	Rubber, vulcanized or thermoplastic - Determination of tensile stress-strain properties
ISO 188	Rubber, vulcanized - Accelerated ageing or heat-resistance tests
ISO 1817	Rubber, vulcanized - Determination of the effect of liquids
ISO 4649	Rubber - Determination of abrasion resistance using a rotating cylindrical drum device
ISO/TR 8330	Rubber and plastics - Glossary of terms used by the hose industry

### 3 Definitions

For the purposes of this standard, the definitions given in ISO/TR 8330 apply.

### 4 Types of hoses

Hoses shall be one of the following types:

type D: delivery hose;

type D-LT : delivery hose, low temperature;

type SD: suction and delivery hose, helix reinforced.

type SD-LT : Suction and delivery hose, helix reinforced, low temperature.

All these types can be either:

a) electrically bonded, designated and marked "M" type, or;

b) electrically conductive, using a conductive rubber layer, designated and marked "Ω" type.

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### 5 Materials and construction

The hose shall consist of the following:

- a lining of synthetic rubber resistant to n-pentane;
- a reinforcement of layers of woven, braided or spirally wound textile material or braided or spirally wound wire;
- an embedded helix reinforcement (type SD and type SD-LT only);
- two or more low resistance electrical bonding wires (type "M" only);
- an outer cover of synthetic rubber, resistant to abrasion and outdoor exposure. The cover shall be pricked to allow gas permeation.

Assemblies shall incorporate metallic fittings attached to the hose by the assembler.

Note : All materials used in the construction should be free from defects and suitable for the temperature range specified.

## 6 Dimensions

### 6.1 Nominal bore, internal diameters, outside diameters, minimum bend radius

When measured in accordance with method A of EN 24671 the internal diameter and outside diameter and their tolerances shall comply with table 1 or table 2, depending on the type.

When tested by the method described in EN 21746, the value of the minimum bend radius shall be as given in table 1 or table 2, depending on the type.

**Table 1 : Dimensions of hoses of types D and D-LT**

Nominal bore	Internal diameter mm	Tolerance mm	Outside diameter mm	Tolerance mm	Design minimum bend radius* mm
12	12,7	± 0,5	22,7	± 1,0	100
15	15	± 0,5	25	± 1,0	120
16	15,9	± 0,5	25,9	± 1,0	125
19	19	± 0,5	31	± 1,0	160
25	25	± 0,5	38	± 1,0	200
32	32	± 0,5	45	± 1,0	250
38	38	± 0,5	52	± 1,0	320
50	50	± 0,6	66	± 1,2	400
51	51	± 0,6	67	± 1,2	400
63	63	± 0,6	81	± 1,2	550
75	75	± 0,6	93	± 1,2	650
76	76	± 0,6	94	± 1,2	650
80	80	± 0,6	98	± 1,2	725
100	100	± 1,6	120	± 1,6	800
150	150	± 2,0	174	± 2,0	1200
200	200	± 2,0	224	± 2,0	1600

\*) The design minimum bend radius is measured to the surface of the hose on the inside of the bend.

NOTE : Other diameters than those listed in this table can be agreed with the manufacturer.



Table 2 : Dimensions of hoses of types SD and SD-LT

Nominal bore	Internal diameter mm	Tolerance mm	Outside diameter mm	Tolerance mm	Design minimum bend radius* mm
12	12,7	± 0,5	22,7	± 1,0	90
15	15	± 0,5	25	± 1,0	95
16	15,9	± 0,5	25,9	± 1,0	95
19	19	± 0,5	31	± 1,0	100
25	25	± 0,5	38	± 1,0	150
32	32	± 0,5	45	± 1,0	200
38	38	± 0,5	52	± 1,0	280
50	50	± 0,6	66	± 1,2	350
51	51	± 0,6	67	± 1,2	350
63	63	± 0,6	81	± 1,2	480
75	75	± 0,6	93	± 1,2	550
76	76	± 0,6	94	± 1,2	550
80	80	± 0,6	98	± 1,2	680
100	100	± 1,6	120	± 1,6	720
150	150	± 2,0	174	± 2,0	1000
200	200	± 2,0	224	± 2,0	1400

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\*) The design minimum bend radius is measured to the surface of the hose on the inside of the bend.

NOTE : Other diameters than those listed in this table can be agreed with the manufacturer.

## 6.2 Minimum thickness of lining and cover

The minimum thickness of both the lining and cover of all hoses shall be 1,6 mm.

## 7 Physical properties

### 7.1 Compounds

The physical properties of the compounds used for the lining and cover shall comply with the values given in table 3, when tested by the methods listed in table 3.

Tests shall be carried out either on samples taken from the hose or from separately vulcanized sheets.