

Thermoplastic multi-layer (non-vulcanized) hoses and hose assemblies for the transfer of hydrocarbons, solvents and chemicals — Specification

The European Standard EN 13765:2003 has the status of a British Standard

ICS 23.040.70

National foreword

This British Standard is the official English language version of EN 13765:2003.

The UK participation in its preparation was entrusted to Technical Committee PRI/66, Rubber and plastics tubing, hoses and hose assemblies, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible 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.

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English version

Thermoplastic multi-layer (non-vulcanized) hoses and hose assemblies for the transfer of hydrocarbons, solvents and chemicals - Specification

Tuyaux et flexibles en thermoplastique multicouches (non vulcanisés) utilisés pour le dépotage d'hydrocarbures, solvants et produits chimiques - Spécification

Thermoplastische, mehrlagige (nicht vulkanisierte) Schläuche und Schlauchleitungen für die Förderung von Kohlenwasserstoffen, Lösungsmittel und Chemikalien - Spezifikation

This European Standard was approved by CEN on 28 November 2002.

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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.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document (EN 13765:2003) has been prepared by Technical Committee CEN/TC 218 "Rubber and plastic 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of an identical text or by endorsement, at the latest by August 2003, and conflicting national standards shall be withdrawn at the latest by August 2003.

Annexes B, C, D, E, F, G, H, I, J and K are normative. Annexes A and L are informative.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies requirements for four types of thermoplastic multi-layer (non-vulcanized) hoses and hose assemblies for carrying hydrocarbons, solvents and chemicals. It specifies bore sizes from 25 mm to 300 mm, working pressures from 4 bar¹ to 14 bar and working temperatures from –30 °C to 150 °C.

Type 1 hoses are suitable for vapour applications. Types 2 to 4 hoses are suitable for liquid applications.

NOTE The attention of users is drawn to annex A concerning the selection of the material for the inner wall of layers and any polymeric coating of the inner helix related to the chemical(s) to be conveyed by the hoses and/or hose assemblies.

This standard does not apply to hose assemblies for:

aircraft refuelling	(EN 1361);
fuel dispensing	(EN 1360);
oil burners	(EN ISO 6806);
liquefied petroleum gas and liquefied natural gas	(prEN 13766);
fire fighting	(EN ISO 14775);
refrigeration circuits	

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 the latest edition of the publication referred to applies (including amendments).

EN 590, *Automotive fuels - Diesel - Requirements and test methods*.

EN 10088-1:1995, *Stainless steels — Part 1: List of stainless steels*.

EN ISO 1043-1, *Plastics - Symbols and abbreviated terms - Part 1: Basic polymers and their special characteristics (ISO 1043-1:2001)*.

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

EN ISO 1746, *Rubber or plastics hoses and tubing - Bending tests (ISO 1746:1998, including technical corrigendum 1:1999)*.

EN ISO 2411, *Rubber- or plastics-coated fabrics - Determination of coating adhesion (ISO 2411:2000)*.

EN ISO 4671, *Rubber and plastics hose and hose assemblies - Methods of measurement of dimensions (ISO 4671:1999)*.

EN ISO 4672, *Rubber and plastics hoses - Sub-ambient temperature flexibility tests (ISO 4672:1997)*.

EN ISO 7233, *Rubber and plastics hoses and hose assemblies - Determination of suction resistance (ISO 7233:1991)*.

EN ISO 8031, *Rubber and plastics hoses and hose assemblies - Determination of electrical resistance (ISO 8031:1993)*.

EN ISO 8330:2000, *Rubber and plastics hoses and hose assemblies - Vocabulary (ISO 8330:1998)*.

ISO 209, *Wrought aluminium and aluminium alloys — Chemical composition and forms of products*.

ISO 1817, *Rubber, vulcanized — Determination of the effect of liquids*.

¹ 1 bar = 0,1 MPa

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 8330:2000 apply.

WARNING — Persons using this European Standard should be familiar with normal laboratory practice. This standard does not purport to address all the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate health and safety practices and to ensure compliance with any national regulatory conditions.

4 Classification

Hoses are classified according to working pressure and working temperature range as given in Table 1.

Table 1 — Pressure and temperature range

	Type 1	Type 2	Type 3	Type 4
Maximum working pressure (bar)	4	10	14	14
Proof pressure (bar)	6	15	21	21
Minimum burst pressure (bar)	16	40	56	56
Vacuum rating (bar)	0,5	0,9	0,9	0,9
Working temperature range (°C)	20 to +60	30 to +80	30 to +80	30 to +150

5 Materials and construction

5.1 General

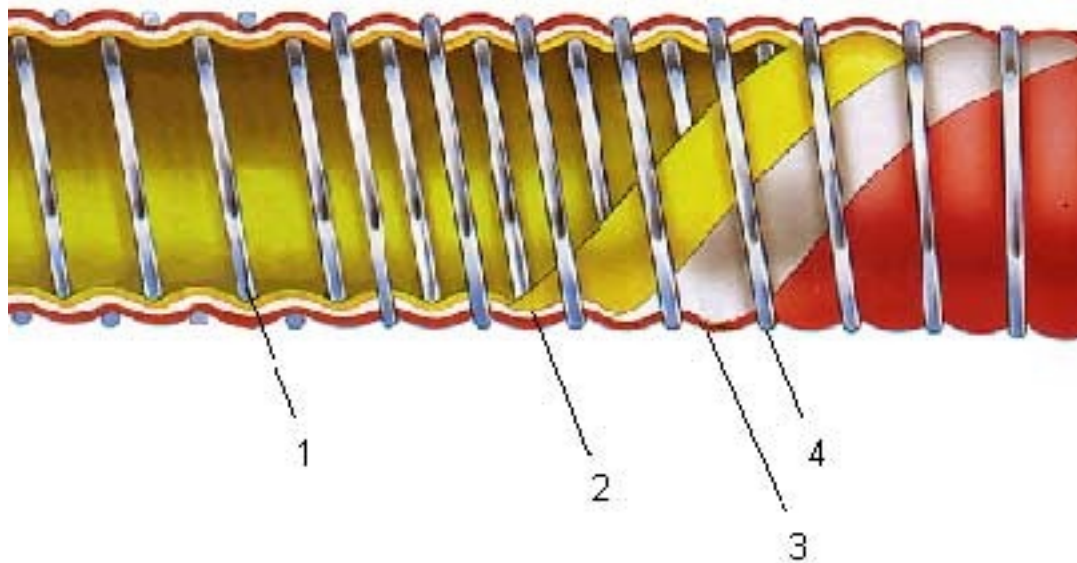
Hoses shall be constructed as shown in Figure 1 and shall consist of the following:

- an internal wire helix (see clause 5.2);
- a multi-ply wall of layers of films and fabrics made of thermoplastics that in combination give the required properties and provide a complete seal (see also annex A);
- a cover consisting of a fabric with abrasion resistant polymeric coating;
- an external wire helix (see clause 5.2).

5.2 Internal and external wire

Wire shall be chosen in accordance with its chemical resistance from one of the following materials:

- stainless steel conforming to EN 10088-1:1995 numbers 1.4306, 1.4401, 1.4404 or 1.4436;
- carbon steel wire conforming to annex B and either galvanized in accordance with annex C or sheathed in a polymeric material of a minimum wall thickness of 0,5mm, resistant to liquid hydrocarbon or liquid chemicals as agreed between purchaser and manufacturer (see annex A);
- aluminium wire conforming to ISO 209.



Key

- 1 Inner wire
- 2 Film
- 3 Fabric
- 4 Outer wire

Figure 1 — Section of a typical thermoplastic multi-layer hose

6 Dimensions

6.1 Internal diameters, with tolerances and minimum bend radii

When measured in accordance with EN ISO 4671, the values of the internal diameters of the hose shall conform to Table 2. When tested by the method described in EN ISO 1746 the values of the minimum bend radius shall be as given in Table 2. The hose shall show no sign of permanent deformation of the cross section i.e. kinking.

Table 2 — Dimensions and minimum bend radii

Dimensions in millimetres

Internal diameter	Tolerance	Minimum bend radii			
		Type 1	Type 2	Type 3	Type 4
25	1	125	125	200	200
32	1	150	150	200	200
38	1	150	150	200	200
40	1	150	150	200	200
50	1	200	200	225	225
65	2	200	200	225	225
75	2	280	280	300	300
80	2	300	300	350	350
100	2	400	400	400	400
150	2	575	575	575	—
200	3	800	800	800	—
250	3	1000	1000	1000	—
300	+3	1200	1200	1200	---

6.2 Tolerance on length

When tested in accordance with EN ISO 4671 the tolerance on the measured length of delivered hose assemblies shall be $^{+2}_{-1} \%$.

7 Performance requirements of hoses and hose assemblies

7.1 Cover

When tested in accordance with EN ISO 2411, the adhesion between the fabric used for the outer cover and its abrasion resistant coating shall be no less than 1,5 kN/m.

7.2 Hoses

When tested in accordance with the methods given in Table 3, the physical properties of the hoses shall conform to Table 3.