BRITISH STANDARD

BS 3746 : 1990

Specification for

PVC garden hose

Tuyaux de jardin en PVC - Spécifications

Gartenschläuche aus PVC

STANDARDS

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Rubber Standards Policy Committee (RUM/-) to Technical Committee RUM/9, upon which the following bodies were represented:

Association of Metropolitan Authorities
British Coal Corporation
British Compressed Gases Association
British Gas plc
British Railways Board
British Rubber Manufacturers' Association
Chief and Assistant Chief Fire Officers' Association
Energy Industries Council
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Liquefied Petroleum Gas Industry Technical Association (UK)
London Fire and Civil Defence Authority
London Regional Transport
Malaysian Rubber Producers Research Association
Ministry of Defence
Society of Motor Manufacturers and Traders Ltd.

This British Standard, having been prepared under the direction of the Rubber Standards Policy Committee, was published under the authority of the Board of BSI and comes into effect on 30 September 1990

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The following BSI references relate to the work on this standard:
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Contents

Foreword

This British Standard, prepared under the direction of the Rubber Standards Policy Committee, is a revision of BS 3746 : 1964 which is withdrawn. Changes from the previous edition include the following.

(a) The original specification has been replaced by two types, a reinforced flexible PVC hose and an unreinforced PVC hose.

(b) A further type, specifying a layflat hose, has been added together with a specific test for seam splitting for this type.

(c) A test for compatibility with fittings has been introduced.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Specification

1 Scope

This British Standard specifies dimensional and performance requirements for three types of PVC garden hose in a range of sizes.

Hoses complying with this specification are designed for use with cold water at working pressures up to 7 bar[1].

They are not intended for use with potable water, beverages and food stuffs.

Appendix B gives recommendations for the care of PVC hoses to prolong service life.

NOTE. The titles of the publications referred to in this standard are listed on the inside back cover.

2 Classification

The hose shall be supplied as a hose or an assembly.

NOTE. Purchaser and supplier may agree whether the hose is supplied as a hose or an assembly.

Three types of hose are specified:

(a) type A : unreinforced flexible PVC suitable for applications up to 7 bar working pressure where valving off at the outlet is not required;

(b) type B : reinforced flexible PVC suitable for applications up to 7 bar working pressure where greater dimensional stability under working pressure is required and valving off at the outlet may be required;

(c) type C : as for type B but manufactured in a layflat form to enable winding onto a storage reel.

3 Materials and construction

Type A shall be extruded from a flexible PVC compound and the finish shall be smooth or fluted.

Types B and C shall consist of:

(a) lining extruded from flexible PVC;

(b) a natural or synthetic reinforcement;

(c) a cover extruded from flexible PVC which shall have a smooth or fluted finish.

NOTE. The colour of the cover may be different from the lining.

The extrusion shall be as uniform as is commercially practicable in its physical properties, fully gelled and free from visible cracks, porosity, foreign inclusions and other defects that might affect serviceability.

The flexible PVC compound shall be manufactured from a polymer of vinyl chloride or a copolymer, the major constituent of which shall be vinyl chloride with plasticizing and other suitable ingredients.

The plasticized material used in the manufacture of the product shall not contain di-n-butyl phthalate (DBP) or di-isobutyl phthalate (DIBP) plasticizers since these can lead to a whitening of plant leaves when used in horticultural applications (phytotoxicity).

The material shall have a relative density at 20 °C of not more than 1.45.

4 Dimensions and tolerances

When measured in accordance with method 4.1 and method 7.1 of BS 5173 : Section 101.1 : 1985, all types of hose shall comply with the bore dimensions and wall thicknesses given in table 1.

Table 1. Bore dimensions and wall thicknesses

Nominal bore	Allowed limits	Maximum wall thickness[1]	Minimum wall thickness[1]
mm	mm	mm	mm
12.5	$^{+0}_{-0.8}$	2.8	1.5
16	$^{+0}_{-0.8}$	3.2	2.0
19	$^{+0}_{-0.8}$	4.0	2.4

[1] In the case of fluted hoses this measurement shall be taken between the base of the flutes and the inside wall.

5 Physical requirements of the finished hose

5.1 Hydrostatic test requirements

When tested in accordance with clause **9** of BS 5173 : Section 102.1 : 1985 the hose shall comply with the minimum burst pressure and proof pressure given in table 2.

When tested in accordance with **7.2.3** of BS 5173 : Section 102.1 : 1985 at a working pressure of 7 bar the hose shall comply with the maximum diameter increase given in table 2.

[1] 1 bar = 10^5 N/m^2 = 10^5 Pa.

Table 2. Hydrostatic test requirements

	Minimum burst pressure	Proof pressure	Increase in diameter at 7 bar to be not greater than:
	bar	bar	%
Type A	17.5	10	25
Type B	24	14	25
Type C	24	14	25

5.2 Compatability with fittings

When hoses are supplied with fittings an acceptability test shall be carried out to satisfy that there are no leaks after the assembly has been subjected to the proof pressure indicated in table 2 for a duration of not less than 30 min.

5.3 Seam splitting test (Type C only)

When tested in accordance with appendix A all six samples shall not split or show evidence of splitting when subjected to a minimum of 25 000 cycles each.

5.4 Cold flex requirements

When tested in accordance with BS 2782 : Method 150B the flexible PVC compound used to manufacture the hose shall comply with the maximum temperature given in table 3.

5.5 Loss of mass on heating

When tested in accordance with BS 2782 : Method 465B the flexible PVC compound used to manufacture the hose shall comply with the loss of mass on heating given in table 3.

Table 3. Requirements for cold flex test and loss of mass on heating

Cold flex temperature before ageing (max.)	0 °C
Cold flex temperature after ageing (max.)	5 °C
Loss of mass on heating	7 %

5.6 Colour bleeding

When tested in accordance with BS 2782 : Method 542A the flexible PVC compound used to manufacture the hose shall show no more than moderate colour bleeding.

5.7 Bending tests (Types A and B only)

The hose shall be manufactured such that the minimum bend radius is 12 × nominal bore.

When the hose is tested in accordance with method A of BS 5173 : Section 103.5 with a bend radius of 12 × the nominal bore, the value of *T/D* shall be not less than 0.80.

6 Marking and packaging

Each length of hose or package of hose shall have a label attached to it giving the following information:

(a) the manufacturer's name or identification;

(b) the number of this British Standard and the type;

(c) the batch reference;

(d) the nominal bore;

(e) the length in metres;

(f) the month and year of manufacture

e.g. MN/BS 3746 Type A/B.REF/16/25 m/12-89.

NOTE. When hose is sold in packages the information may be indelibly indicated on the package.

The following warning shall also be given on the label:

'THE HOSE SHOULD NOT BE USED FOR POTABLE WATER, BEVERAGES AND FOOD STUFFS'.

Appendices

Appendix A. Seam splitting test apparatus

The apparatus shall be arranged so that the valve cams operate two valves feeding air at 7 bar to two samples working a cycle where they shall be pressurized for 3 s and the pressure then released for a further 3 s.

The samples shall have a plugged fitting attached at one end, the other end being attached to the air feed. The plane of the lay flat shall be as shown in figure 1 and be plugged and restrained in such a manner that the sample when not inflated takes up a natural position.

Six samples shall be tested from each production batch, three in air and three in water.

Two 1 m ± 5 mm test lengths shall be fitted to the apparatus. Sample A shall be tested at an ambient air temperature of 23 ± 2 °C. Sample B shall be tested immersed in water which is maintained at a temperature of 12 ± 2 °C.

Appendix B. Use and care of PVC hoses

A prolonged service life may be obtained from the hose if the following precautions are taken.

(a) Never leave the water shut off at the nozzle.

(b) Do not use with steam or with hot water.

(c) Keep away from sharp objects and cutting tools.

(d) Do not run over the hose with a car, lawn mower, wheel barrow etc.

(e) Store away without kinks or twists in the hose and preferably in a place where the hose will not be subjected to direct sunlight or heat.

(f) Ensure that the hose is completely drained after use.

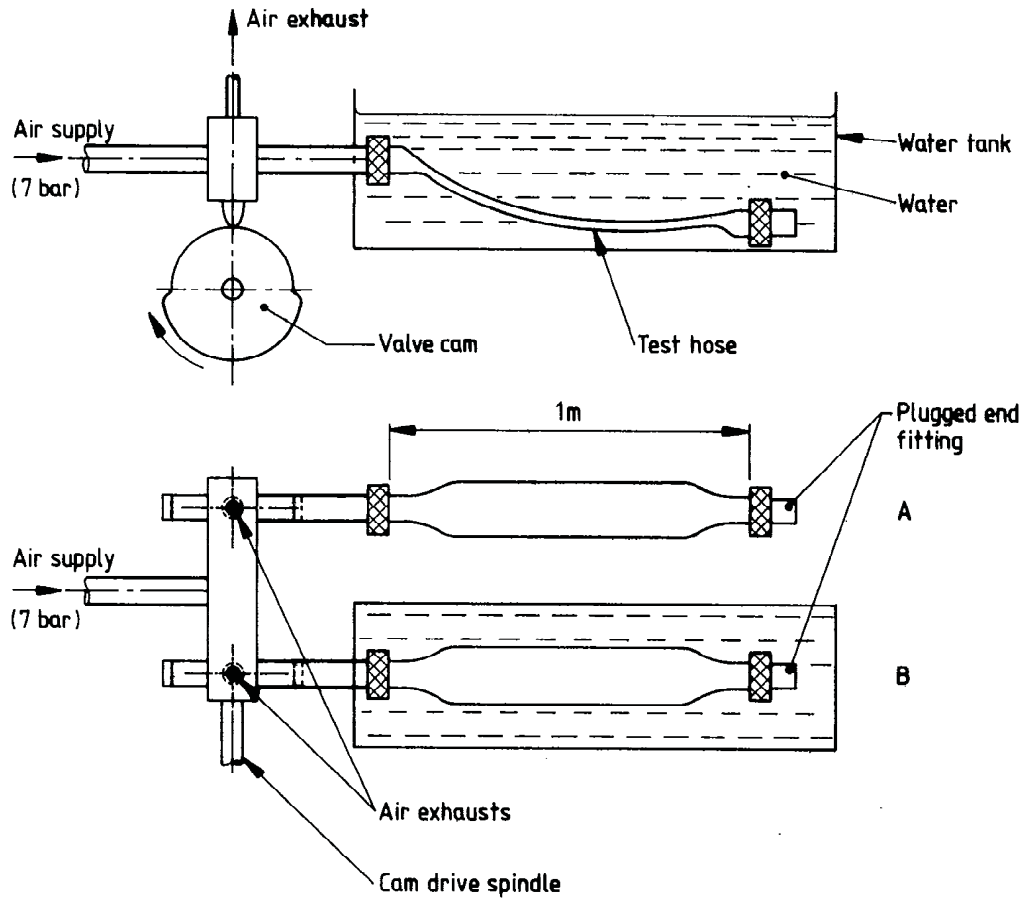

Figure 1. Apparatus for seam splitting test

Publications referred to

BS 2782 Methods of testing plastics
Method 150B Determination of cold flex temperature of flexible polyvinyl compound
Methods 465A and 465B Determination of loss of plasticizers (activated carbon method)
Method 542A Qualitative evaluation of bleeding of colorants

BS 5173 Methods of test for rubber and plastics hoses and hose assemblies
Section 101.1 Measurement of dimensions (excluding length)
Section 102.1 Hydrostatic tests
Section 103.5 Bending tests

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