BS 5119 :1980
UDC 621.643.3.031 :678.066—462

British Standard Specification for

General purpose rubber water hoses

Spécification des tuyaux d'eau en caoutchouc à usage général

Spezifikation für Mehrzweckwasserschläuche aus Kautschuk

Foreword

This revision of this British Standard has been prepared under the direction of the Rubber Standards Committee.

This standard was first published in 1975, and together with others in the series BS 5118 to BS 5122, superseded BS 796 'Hose of rubber with cotton or rayon braided reinforcement' and BS 924 'Hose of rubber with cotton or rayon woven reinforcement'. It was based on the requirements for Type 2 specified in ISO 1403 'General purpose rubber water hose', prepared by Technical Committee TC 45, Rubber and rubber products, of the International Organization for Standardization (ISO).

This revision now includes requirements for high pressure water hoses based on Type 3 of ISO 1403. These requirements were previously specified in BS 3716 which is consequently withdrawn.

Further changes from the 1975 edition are as follows:

(a) the cover and lining thicknesses are the same for mandrel made and non-mandrel made hoses;

(b) the ageing requirements are more stringent;

(c) the test methods of BS 5173 are referred to instead of being included in appendices;

(d) the marking requirement now includes the quarter of the year of manufacture;

(e) the imperial equivalents of metric values are omitted.

This standard differs from ISO 1403 in the following respects:

(1) there is no equivalent to Type 1 of ISO 1403;

(2) certain nominal bore sizes used in the United Kingdom but not adopted internationally are retained;

(3) lining and cover thicknesses are specified;

(4) certain values for tensile properties which are not adopted internationally are specified;

(5) a ratio for working pressure : minimum burst pressure of 1 : 3.15 is given in place of 1 : 4 specified in ISO 1403;

(6) a longer period of ageing is specified.

This standard is based primarily on performance requirements. In order to take account of technological developments, no requirements are included for specific materials, constructions and manufacturing methods although minimum physical properties are specified for the lining and cover compounds.

Attention is drawn to the work of BSI Committee EPC/44/7 on the development of test methods for assessing the effect of materials in contact with potable water. It is intended, ultimately, that this standard will include requirements to the effect that the lining of hoses to be used for potable water shall be free from known toxic substances which can be extracted by water and shall not foster microbial growth nor give rise to taste, odour or cloudiness in the water which it conveys. It is also intended that, when compliance with these requirements can be effectively demonstrated by employing the tests now under development, a requirement to mark such hoses with a distinctive symbol will be added to this standard.

Certification. Attention is drawn to the certification facilities described on the inside back cover of this standard.

1. Scope

This British Standard specifies the requirements for two types of rubber water hoses for use at temperatures below 100 °C, as follows:

Type A: low pressure type for design working pressures up to and including 10 bar* with nominal bores from 10 mm to 100 mm;

Type B: high pressure type for design working pressures up to and including 20 bar with nominal bores from 10 mm to 100 mm.

2. References

The titles of the standards publications referred to in this standard are listed on page 3.

3. Construction

3.1 The hoses shall consist of:

(a) an elastomeric lining;

(b) a reinforcement;

(c) an elastomeric cover.

The lining and cover shall be of uniform thickness, reasonably concentric, and free from holes, porosity and other defects.

NOTE. The lining and cover materials are not defined in this standard but attention is drawn to the work of BSI committee EPC/44/7 in connection with the use of materials in contact with potable water (see foreword).

3.2 Hoses of nominal bore not greater than 38 mm may be mandrel made or non-mandrel made; hoses of nominal bore above 38 mm shall be mandrel made. The cover finish may be smooth, fluted or fabric marked.

4. Dimensions and tolerances

4.1 Bore. When measured in accordance with the method described in BS 5173 : Part 1, the bore of the hoses shall comply with the appropriate values given in table 1.

Table 1. Nominal bores and tolerances

Nominal bore	Tolerances	
	Mandrel made hoses	Non-mandrel made hoses
mm	mm	mm
10 12.5 16 19	± 0.75	± 0.75
25 31.5	± 0.75	± 1.25
38	± 0.75	± 1.50
50 63	± 0.75	–
76 100	± 1.50	–

4.2 Lining and cover thickness. When measured in accordance with the method described in BS 5173 : Part 1, the thickness of the lining and the cover shall be not less than the values given in table 2.

Table 2. Minimum thicknesses of lining and cover

	Type A	Type B
	mm	mm
Lining	1.5	1.5
Cover	1.0	1.5

If the cover is fluted, the depth of the flute shall be not greater than 50 % of the cover thickness.

4.3 Tolerance on cut lengths of hoses. The tolerance on cut lengths of hoses shall be as given in table 3.

Table 3. Tolerances on cut lengths

Nominal length of hoses	Tolerances
mm	mm
Up to and including 300	± 3
Over 300 and up to and including 600	± 4.5
Over 600 and up to and including 900	± 6
Over 900 and up to and including 1200	± 9
Over 1200 and up to and including 1800	± 12
Over 1800	± 1 % of nominal length

5. Physical properties of lining and cover

5.1 Tensile strength and elongation at break of lining and cover. When tested in accordance with the method described in BS 903 : Part A2, using dumb-bell test pieces of type 1 dimensions, the elastomeric mix used for the lining and cover shall have a tensile strength and elongation at break not less than the values given in table 4. The test shall be carried out on test sheets of the appropriate elastomeric mix vulcanized to the same degree as the hose.

Table 4. Tensile strength and elongation at break

	Tensile strength	Elongation at break
	MPa	%
Lining	5.0	250
Cover	5.0	300

5.2 Accelerated ageing test. After ageing test pieces, prepared as described in **5.1** for 96 h at 70 ± 2 °C in accordance with method A or method B described in BS 903 : Part A19, the tensile strength and elongation at break shall not vary from the corresponding unaged values by more than + 10 % or - 30 % for both types of hoses.

6. Performance requirements

6.1 Adhesion. When tested in accordance with the method described in BS 5173 : Part 3, the adhesion between lining and reinforcement, between layers of reinforcement and between cover and reinforcement, shall be not less than 1.5 kN/m.

6.2 Pressure requirements. When tested in accordance with the method described in BS 5173 : Part 2, the hoses shall comply with the requirements given in table 5 and shall show no cracks or leak at proof pressure.

*1 bar = 10^5 N/m² = 100 kPa.

Table 5. Hydrostatic pressure requirements

	Type A	Type B
Design working pressure	10 bar	20 bar
Proof pressure	16 bar	31.5 bar
Maximum change in diameter at proof pressure	+15 %, -5 %	+15 %, -5 %
Maximum change in length at proof pressure	± 12 %	± 12 %
Minimum burst pressure	31.5 bar	63 bar

7. Marking

Each length of hose shall be labelled, with a tag tied on the hose, with the following information. In addition, hoses shall be continuously marked with the same information.

(a) Hose supplier's name or identification.

(b) Details of the hose as follows:

(1) the number of this British Standard* with the type letter as suffix, e.g. BS 5119/A;

(2) the nominal bore, e.g. 31.5;

(3) the quarter and year of manufacture, e.g. 4/80;

(4) the design working pressure, e.g. 10.

This information may be conveniently presented in the following manner:

Manufacturer/BS 5119/A/31.5/4/80/10

*Marking BS 5119 on or in relation to a product is a claim by the manufacturer that the product has been manufactured in accordance with the requirements of the standard. The accuracy of such a claim is therefore the manufacturer's sole responsibility. Enquiries as to the availability of third party certification to support such claims should be addressed to the Director, British Standards Institution, Maylands Avenue, Hemel Hempstead, Herts HP2 4SQ in the case of certification marks administered by BSI or to the appropriate authority for other certification marks.

Standards publications referred to

BS 903 Methods of testing vulcanized rubber
Part A2 Determination of tensile stress-strain properties
Part A19 Heat resistance and accelerated air ageing tests

BS 5173 Methods of test for hoses
Part 1 Measurement of dimensions
Part 2 Hydraulic pressure tests
Part 3 General physical tests

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Further particulars may be obtained from the Certification and Assessment Department, British Standards Institution, Maylands Avenue, Hemel Hempstead, Herts. HP2 4SQ.

The Kitemark

The 'Safety Mark'

This British Standard, having been prepared under the direction of the Rubber Standards Committee, was published under the authority of the Executive Board and comes into effect on 30 May 1980.

First published May 1975
First revision May 1980

ISBN 0 580 11362 0

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The following BSI references relate to the work on this standard:
Committee reference RUC/9 Draft for comment 79/50484 DC

Cooperating organizations

The Rubber Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

*British Association of Synthetic Rubber Manufacturers
*British Rubber Manufacturers' Association
Department of Industry (Chemicals and Textiles)
Medical Sterile Products Association
*Ministry of Defence
Plastics and Rubber Institute
Rubber and Plastics Research Association of Great Britain
Rubber Growers' Association
*Society of Motor Manufacturers and Traders Limited
*The Malaysian Rubber Producers' Research Association

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

British Railways Board
Chief and Assistant Chief Fire Officers' Association
Fire Extinguishing Trades Association
Institution of Fire Engineers
Institution of Mechanical Engineers
Liquefied Petroleum Gas Industry Technical Association (UK)
London Transport Executive
National Coal Board

Amendments issued since publication

Amd. No.	Date of issue	Text affected