BS 5121 : 1975

UDC 621.643.33.04 : 678.066–462 : 621.9249

Specification for

Rubber sandblast hose

Gr 5

British Standards Institution

This British Standard, having been approved by the Rubber Industry Standards Committee, was published under the authority of the Executive Board on 31 January 1975.

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Contract requirements
Attention is drawn to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

Revision of British Standards
In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

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The following BSI references relate to the work on this standard:
Committee reference RUC/9 Draft for comment 72/50925 DC

Co-operating organizations

The Rubber Industry Standards Committee, under whose supervision 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 Ltd.
*Department of Trade and Industry
*Malaysian Rubber Producers' Research Association
*Ministry of Defence
*Rubber and Plastics Research Association of Great Britain
Rubber Growers' Association
*Society of Motor Manufacturers and Traders Ltd.

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
Canvas Hose Manufacturers' Association
Chemical Industries Association
Chief Fire Officers' Association
Department of the Environment
Fire Extinguisher Trades Association
Home Office
Institution of Fire Engineers
Institution of Mechanical Engineers
Liquefied Petroleum Gas Industry Technical Association
National Coal Board
Oil Companies Materials Association
Post Office

BSI

Amendment Slip No. 1
published and effective from 30 January 1981
to BS 5121 : 1975

Rubber sandblast hose

Revised text

AMD 3593
January 1981

Contents

Under 'Appendices' against both 'A' and 'E' delete the existing text and substitute 'Text deleted' in both places.

AMD 3593
January 1981

Foreword

Delete existing paragraph 3 and substitute the following text above the note:

'In the preparation of this standard consideration was given to a preliminary draft of ISO 3861-1977 'Rubber hose for grit blasting' which was discussed in Technical Committee TC 45 of the International Organization for Standardization (ISO). After publication of ISO 3861, amendments were approved to the British Standard to align it more completely with the International Standard particularly in respect of:

(a) pressure requirements;

(b) thickness of the lining and cover up to 19 mm bore;

(c) inclusion of requirements for dissipation of static electricity.

However, the responsible UK committee did not consider the provisions of ISO 3861 to be completely acceptable for application in the UK; consequently the amended British Standard differs from ISO 3861 in the following respects:

(a) the United Kingdom usage of 'sandblast' in preference to 'grit blasting';

(b) inclusion of hoses with nominal bores of 12.5 mm, 16 mm, 19 mm, 38 mm and 45 mm and exclusion of hoses with nominal bores of 20 mm and 40 mm;

(c) tighter tolerance on bore for hoses with a nominal bore of 25 mm and larger;

(d) requirements for a thicker lining on hoses with a nominal bore of 19 mm and larger;

(e) for both lining and cover, more stringent requirements for tensile strength and slightly relaxed requirements for elongation at break;

(f) permitted change in elongation after accelerated ageing.

It is intended to specify a requirement and test method for abrasion resistance of the lining when present discussions within ISO/TC 45 have been finalized.'

AMD 3593
January 1981

1. Scope

In line 2 of the existing clause delete '5 bar' and substitute '6.3 bar'.

AMD 3593
January 1981

Clause 3.1

In item (a) delete the existing text and substitute the following:

'(a) a rubber lining which is highly resistant to abrasion'.

At the end of the existing clause insert the following new paragraph:

'They shall be suitably compounded to comply with the requirements of **6.3.** Alternatively, by agreement between the manufacturer and the purchaser, dissipation of static electricity may be provided for by the inclusion of a bonding wire. The bonding wire shall consist of at least nine strands and the metal used shall have a high resistance to fatigue.'

AMD 3593
January 1981

Clause 4.2 Lining and cover thickness

In line 1, delete 'When measured as described in appendix **A**' and substitute 'When measured in accordance with the method described in BS 5173 : Part 1'.

AMD 3593
January 1981

Table 2. Thickness (minimum) of lining and cover

Delete the existing table and substitute the following:

Table 2. Thickness (minimum) of lining and cover

Nominal bore	Lining	Cover
	mm	mm
Up to and including 19 mm	5.0	1.5
Over 19 mm	6.0	1.5

AMD 3593
January 1981

Clause 6.2 Pressure requirements

In line 1 delete 'When tested as described in appendix E' and substitute 'When tested in accordance with the method described in BS 5173 : Part 2'.

AMD 3593
January 1981

Table 5. Hose hydrostatic pressure requirements

In column 2, headed 'Requirement', delete '5 bar†' and substitute '6.3 bar†'; also delete '10 bar' and substitute '12.5 bar' and delete '20 bar' and substitute '25 bar'.

AMD 3593
January 1981

New clause 6.3

Insert immediately after table 5, the following new clause:

'**6.3 Electrical resistance.** When tested in accordance with the method described in BS 5173 : Part 4, the electrical resistance shall not exceed 2×10^6 ohm/m.'

AMD 3593
January 1981

Appendix A. Measurement of thickness

Delete the entire existing text and substitute 'Text deleted.'

AMD 3593
January 1981

Appendix E. Hydrostatic test

Delete the entire existing text and substitute 'Text deleted.'

AMD 3593
January 1981

Inside back cover

In the list of references insert the following in the correct numerical sequence:

'BS 5173 Methods of test for hoses

Part 1 Measurement of dimensions
Part 2 Hydraulic pressure tests
Part 4 Electrical tests'.

BSI

BS 5121 : January 1975

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Specification for

Rubber sandblast hose

Amendments issued since publication

Amd. No.	Date of issue	Text affected

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Contents

Foreword

This British Standard has been prepared under the authority of the Rubber Industry Standards Committee and replaces Part 9 of BS 924 'Hose of rubber with cotton or rayon woven reinforcement', Part 9 'Type K. Sandblast hose'.

The standard is based on performance requirements. In order to take account of modern technological developments specific materials, constructions and manufacturing methods are not stipulated.

This standard is in line with a document under consideration by technical committee ISO/TC 45 'Rubber and rubber products' of the International Organization for Standardization (ISO).

NOTE. All dimensions are shown in millimetres which are the standard. Approximate inch equivalents are shown in parentheses.

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

British Standard Specification for

Rubber sandblast hose

1. Scope

This British Standard specifies the requirements for rubber sandblast hose suitable for working pressures up to 5 bar*.

2. References

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

3. Construction

3.1 The hose shall consist of:

(a) an inner rubber lining;

(b) a reinforcement applied by any suitable technique;

(c) an abrasion resistant outer rubber cover.

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

3.2 As required by the purchaser, the hose may be mandrel or non-mandrel made and the finish may be smooth or fabric marked.

4. Dimensions and tolerances

4.1 **Bore.** The bore of the hose shall be in accordance with the nominal dimensions and tolerances given in table 1.

Table 1. Hose nominal bores and tolerances

Nominal bore		Tolerance	
mm	(in)	mm	(in)
12.5	(½)	± 0.75	(0.030)
16	(⅝)		
19	(¾)		
25	(1)		
31.5	(1¼)		
38	(1½)		
45	(1¾)		
50	(2)		

4.2 **Lining and cover thickness.** When measured as described in appendix A, the thicknesses of the lining and the cover shall not be less than the values given in table 2.

Table 2. Thickness (minimum) of lining and cover

Nominal bore	Lining		Cover	
	mm	(in)	mm	(in)
Up to and including 19 mm	4.5	(0.177)	0.75	(0.030)
Above 19 mm	6.0	(0.236)	1.5	(0.059)

* 1 bar = 10^5 N/m² = 100 kPa

4.3 Tolerance on cut lengths of hose. The tolerance on cut lengths of hose shall be as shown in table 3 unless otherwise agreed between the manufacturer and the purchaser.

Table 3. Tolerance on length

Length of hose	Tolerance
Up to and including 300 mm	± 3 mm
Over 300 mm and up to and including 600 mm	± 4.5 mm
Over 600 mm and up to and including 900 mm	± 6 mm
Over 900 mm and up to and including 1200 mm	± 9 mm
Over 1200 mm and up to and including 1800 mm	± 12 mm
Over 1800 mm	± 1 % of nominal length

5. Physical properties of rubber lining and cover

5.1 Tensile strength and elongation at break. When tested as described in appendix B, the rubber used for the lining and the cover shall have a tensile strength and elongation at break not less than the values given in table 4.

Table 4. Tensile strength and elongation at break

	Tensile strength, min.	Elongation at break, min.
	MPa*	%
Lining	12	400
Cover	10	350

5.2 Accelerated ageing test. After ageing as described in appendix C, the tensile strength and elongation at break of the lining and cover shall not vary from the corresponding unaged values by more than ± 25 %.

6. Performance requirements

6.1 Adhesion. When tested as described in appendix D, the adhesion between lining and reinforcement, between layers of reinforcement and between cover and reinforcement shall be not less than 2.0 kN/m (11.4 lbf/in).

6.2 Pressure requirements. When tested as described in appendix E, the hose shall comply with the requirements of table 5 and shall show no cracks or leaks at proof pressure.

Table 5. Hose hydrostatic pressure requirements

Property	Requirement
Design working pressure	5 bar†
Proof pressure	10 bar
Change in diameter at proof pressure	+ 15 %, – 5 %
Change in length at proof pressure	± 12 %
Minimum burst pressure	20 bar

* 1 MPa is approximately 145 lbf/in²
† 1 bar = 10^5 N/m² = 100 kPa

7. Marking

Each manufactured length of hose shall be labelled with a tag, tied at each end of the hose, marked with the following information:

(a) hose supplier's name or identification;

(b) details of the hose as given below:

(1) the number of this British Standard, i.e. BS 5121;

(2) the nominal bore, e.g. 16;

(3) the year of manufacture, e.g. 1975.

This information shall be stated in the following form:

e.g. BS 5121/16/1975.

Appendix A

Measurement of thickness

A.1 Take a sample piece of hose, approximately 50 mm in length, and mark a diameter on each end, these diameters being at right angles to one another.

A.2 Cut the sample into two equal portions by cutting at right angles to the longitudinal axis and bisect each portion by cutting longitudinally along the marked diameters.

A.3 Measure the thickness of the lining and of the cover on each segment at one point on each of the longitudinal cut edges using an optical magnifier with a suitable graduated scale.

A.4 The average of the eight measurements shall be regarded as the thickness of the lining or cover.

Appendix B

Method of test for tensile strength and elongation at break

Carry out the test in accordance with the method described in BS 903 : Part A2 : 1971 using dumb-bell test pieces of type 1 dimensions. The test shall be carried out on test sheets of the appropriate rubber compound vulcanized under the same conditions as the hose.

Appendix C

Accelerated ageing test

Prepare test pieces for determination of tensile strength and elongation at break as described in appendix B and age them in accordance with method A or method B of BS 903 : Part A19 : 1956 for 96 h at 70 ± 1 °C.

Appendix D

Method of test for adhesion

Determine the adhesion by the method described in BS 903 : Part A12. In the case of hose containing spiralled yarn or wire reinforcement particular care is required in preparing the test pieces.

Appendix E

Hydrostatic test

E.1 Test piece preparation. Cut from the hose a test piece about 1 m long so as to give a minimum length clear of test fittings of 635 mm. Attach test fittings to the hose and ensure that the fitting at one end of the hose is fixed and the other free to move.

E.2 Hose relaxation. Pressurize the hose to the specified design working pressure given in table 4 for 1 min, then reduce the pressure to zero.

E.3 Measurement of initial dimensions

E.3.1 Measure the outside diameter of the hose at three points along the test length, two readings being taken at each point at right angles to each other. Calculate the average of these six measurements and record it as the initial hose diameter.

E.3.2 Place gauge marks on the test piece at a minimum distance from the end fittings of 50 mm. Measure the distance between the gauge marks and record this value.

E.4 Measurement of dimensions at proof pressure. Apply pressure at a rate of not less than 0.7 bar*/s and not more than 1.7 bar/s. When the proof pressure specified in table 4 has been reached, examine the hose for leaks or defects. Then, as quickly as possible, remeasure and record the hose diameter and the distance between the gauge marks.

E.5 Determination of minimum burst pressure. Continue to apply pressure until the minimum burst pressure specified in table 4 has been reached.

E.6 Test report. The following information shall be included in the test report:

(a) proof pressure;
(b) presence of cracks or leaks at proof pressure;
(c) change in diameter at proof pressure;
(d) change in length at proof pressure;
(e) pressure at which the test piece burst or the test pressure attained without bursting.

* 1 bar = 10^5 N/m^2 = 100 kPa

BSI publications referred to in this standard

This standard makes reference to the following British Standards:

BS 903 Methods of test for vulcanized rubber
Part A2 Determination of tensile stress-strain properties
Part A12 Determination of rubber-to-fabric adhesion (ply separation)
Part A19 Accelerated ageing tests

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