BRITISH STANDARD

BS 6956-5: 1992
Incorporating Amendment No. 1

Jointing materials and compounds —

Part 5: Specification for jointing compounds for use with water, low pressure saturated steam, 1st family gases (excluding coal gas) and 2nd family gases

Confirmed December 2011

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Piping Systems Components Standards Policy Committee (PSE/-) to Technical Committee PSE/2, upon which the following bodies were represented:

Asbestos Information Centre Ltd.
British Adhesives and Sealants Association
British Compressed Gases Association
British Gas plc
British Pump Manufacturers' Association
British Railways Board
Energy Industries Council
Engineering Equipment and Materials Users' Association
Institution of Gas Engineers
Institution of Water and Environmental Management
Liquefied Petroleum Gas Industry Technical Association (UK)
Water Services Association of England and Wales

This British Standard, having been prepared under the direction of the Piping Systems Components Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on
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The following BSI references relate to the work on this standard:
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Amendments issued since publication

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Contents

Foreword

This Part of BS 6956 has been prepared under the direction of the Piping Systems Components Standards Policy Committee. It was previously published as section five of BS 5292:1980 which has been deleted by amendment. The requirements have been brought into alignment with modern practice and the method of presentation has been changed to align with companion standards.

The other Parts of BS 6956 specify the following materials and compounds.

— *Part 1: Specification for corrugated metal joint rings;*

— *Part 2*[1)]*: Specification for vulcanized fibre sheets;*

— *Part 3*[1)]*: Specification for flexible vulcanized fibre sheets;*

— *Part 4*[1)]*: Specification for rubber reinforced jointing;*

— *Part 6*[1)]*: Specification for jointing compound for 3rd family gases;*

— *Part 7*[1)]*: Specification for anaerobic jointing compounds for use with 1st, 2nd and 3rd family gases.*

WARNING. This British Standard calls for the use of substances and/or procedures that may be injurious to health if adequate precautions are not taken. It refers only to the technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 4, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

[1)] In preparation.

1 Scope

This Part of BS 6956 specifies requirements for the physical and sealing properties of jointing compounds for use with water, low pressure saturated steam, 1st family gases (excluding coal gas) and 2nd family gases. The jointing compounds are for use with screwed joints on pipework up to 50 mm nominal bore with threads up to R2 as specified in BS 21 and for use with the following:

a) cold water up to a working pressure of 7 bar[2)] (gauge);

b) hot water up to a working pressure of 7 bar (gauge) and a working temperature of up to 100 °C;

c) 1st (excluding coal based) and 2nd family gases up to a working pressure of 7 bar (gauge) and a working temperature of up to 150 °C;

NOTE 1 These are typically referred to as Towns Gas and Natural Gas respectively.

d) low pressure saturated steam up to a working pressure of 7 bar (gauge)

NOTE 2 For classification of 1st and 2nd family gases see BS 4947.

NOTE 3 The titles of publications referred to in this standard are listed on the inside back cover.

NOTE 4 For applications outside these limitations the manufacturer should be consulted.

2 Definitions

For the purposes of this Part of BS 6956 the following definitions apply.

2.1
jointing compound

a manufactured substance which is used for the purpose of sealing screwed metallic joints from the ingress or egress of fluids or gases

2.2
batch

any quantity of jointing compound manufactured at one time

3 Sampling

A sample sufficient to permit one complete series of tests to be carried out at one time shall be selected at random from a batch of jointing compound.

4 Physical properties

4.1 General

The jointing compound shall be free from lumps and shall have wetting properties necessary for adhesion to metallic surfaces. The solids used in its manufacture shall be thoroughly ground and the jointing compound shall be in such a condition that stirring will produce a smooth uniform substance.

4.2 Jointing compounds in contact with potable water

When used under the conditions for which they are designated, non-metallic products in contact with or likely to come into contact with potable water shall comply with BS 6920-1.

NOTE 1 Non-metallic products for installation and use in the United Kingdom which are verified and listed under the UK Water Fittings Byelaws Scheme are deemed to satisfy the requirements of this subclause. Details of the Scheme are obtainable from Water Research centre (WRc) plc, 660 Ajax Avenue, Slough SL1 4BG.

Non-metallic products approved by the Department of the Environment Committee on Chemicals and Materials of Construction for use in Public Water Supply and Swimming Pools are considered free from adverse health effects for the purposes of compliance with this subclause.

NOTE 2 A list of approved chemicals and materials and details of the approvals scheme is available from the Secretary of the Committee at the Department of the Environment, Water Division, Romney House, 43 Marsham Street, London SW 1P 3PY.

5 Testing

5.1 General

When tested in accordance with the methods described in Appendix A and Appendix B, the jointing compound shall not disintegrate or flow out of the joint made, shall not permit any leakage during testing and shall permit dismantling of the joints.

On completion of the tests no damage including corrosion of the metal parts shall be evident.

5.2 Tests

The following tests shall be carried out as described in Appendix A and Appendix B:

a) initial pressure test (see **A.3.1**);

b) drying test (see **A.3.2**);

c) resistance to temperature cycling test (see **A.3.3**);

d) resistance to hydrocarbon test (see **A.3.4**);

e) resistance to hot water test (see **A.3.5**);

f) corrosion test (see Appendix B).

[2)] 1 bar = 10^5 N/m^2 = 100 kPa.

5.3 Retest

If the joint fails in more than one of the tests specified in **5.2**, no retests shall be permitted. If the joint in any one test assembly fails to comply with the requirements of any test, two further test assemblies shall be prepared using jointing compound from the same batch, and each shall comply with the requirements of that test. If the joint of either or both of the retest assemblies fails, it shall be deemed that the whole batch has failed.

5.4 Test conditions

The conditions for all tests shall be a pressure of 14 bar (gauge).

NOTE The test pressure is usually 1½ times the working pressure but 14 bar has been chosen to align with the water industry's practice of testing underground piping at twice the working pressure.

6 Non-corrosive properties

The jointing compound shall not cause corrosion of copper, brass, aluminium or low-carbon steel surfaces when tested in accordance with the method described in Appendix B.

7 Flash point

The flash point temperature, when determined by the Abel apparatus in accordance with BS 2000-170, shall be not less than 13 °C.

8 Storage properties

The jointing compound when stored under conditions specified by the manufacturer and in its original unopened container shall retain the original properties for a minimum period of 2 years.

9 Marking

Packages of jointing compound shall be plainly, clearly and indelibly marked with the following information.

a) The manufacturer's name, and trademark.

b) The number of this British Standard, i.e BS 6956-5[3)].

c) The intended use of the jointing compound, e.g. for use with pipework carrying cold water, hot water, low pressure saturated steam, 1st and 2nd family gases for screwed joints up to 50 mm, 7 bar pressure and 200 °C temperature.

d) Either whether suitable for use with potable water or whether listed by the UK Water Fittings Byelaws Scheme (see **4.2**).

e) A unique identification mark providing traceability, e.g. a manufacturing batch number.

f) Method of application.

[3)] Marking BS 6956-5 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which may also be desirable.

Appendix A Initial pressure test, drying test, temperature cycling test, hydrocarbon test and hot water test

A.1 Apparatus

A.1.1 *Heavy tube*, six 250 mm lengths of 25 mm tube complying with BS 1387 and threaded R1 in accordance with BS 21.

A.1.2 *Six steel sockets* threaded R_p1 in accordance with BS 21.

A.1.3 *Six steel plugs*, externally threaded R_c1 complying with BS 21:1985.

A.1.4 *Air or nitrogen supply* of 14 ± 0.5 bar (gauge) pressure.

A.1.5 *Oven*, capable of holding the assemblies with a heating facility to raise the temperature to 200 ± 5 °C.

A.1.6 *Water bath*, of sufficient capacity to hold the assemblies.

A.1.7 *Four steel sealing plugs*, externally threaded $R_c1 \times \frac{1}{2}$ complying with BS 21:1985.

A.1.8 *Six steel reducing sockets*, threaded $R_p1 \times \frac{1}{2}$ complying with BS 21:1985.

A.2 Preparation of test assemblies

Prepare six test assemblies, each assembly consisting of a 250 mm length of 25 mm heavy tube (**A.1.1**), a steel socket (**A.1.2**), a steel plug (**A.1.3**) and a steel reducing socket (**A.1.8**).

Clean the threads of all swarf, paint, oil or other contaminants before applying the compound.

Evenly coat the whole of the external threads on the tube with the jointing compound, completely filling the threads.

Do not apply jointing compound to the socket. Screw the socket to the pipe until hand tight and using a suitable gripping tool tighten with a torque of 100 N m. Remove any excess jointing compound from the outside of the joint.

In a similar manner screw the plug into the socket and screw the reducing socket on to the other end of the tube, taking care not to transmit the torque to joints already made.

A.3 Tests

A.3.1 *Initial pressure test*

Connect each test assembly in turn to an air pressure or nitrogen supply at 14 bar (gauge) pressure (**A.1.4**) and slowly pressurize it. Immerse each assembly in a water bath (**A.1.6**) at 20 °C ± 5 °C for a minimum of 5 min and inspect it for any leakage by observing any bubbles that appear. Ignore any bubbles that appear during the first 15 s of immersion. Report whether the R1 joints on the assemblies hold pressure or leak.

A.3.2 *Drying test*

De-pressurize the test assemblies used in **A.3.1**, stand vertically and allow to dry for 168 h at a temperature of 20 ± 5 °C.

Repeat the procedure described in **A.3.1**.

A.3.3 *Resistance to temperature cycling test*

Select two test assemblies that were leak free in **A.3.1** and **A.3.2**. Heat these in the oven (**A.1.5**) to a test temperature of 200 ± 5 °C, hold at this temperature for 1 h and cool to room temperature. Repeat for a total of six cycles, each cycle lasting approximately $1\frac{1}{2}$ h.

Repeat the procedure described in **A.3.1** for both assemblies.

A.3.4 *Resistance to hydrocarbon test*

Fill two new test assemblies that were leak free in **A.3.1** and **A.3.2** with a mixture of 70 % by volume 2,2,4-trimethyl pentane and 30 % by volume of toluene, and seal the reducing sockets (**A.1.8**) with the sealing plugs (**A.1.7**).

Allow them to stand vertically for 168 h at ambient temperature. At the end of the test period carefully remove the plugs and drain the test assembly.

Repeat the procedure described in **A.3.1** for both assemblies.

A.3.5 *Resistance to hot water test*

Fill two new test assemblies that were leak free in **A.3.1** and **A.3.2** with water, and seal the reducing sockets (**A.1.8**) with the sealing plugs (**A.1.7**). Place the assemblies in an oven (**A.1.5**) at 100 °C ± 5 °C for 6 h. At the end of this period remove the assemblies, allow them to cool to room temperature, remove the plugs and drain off the water.

Repeat the procedure described in **A.3.1** for both assemblies.

A.3.6 *Cleaning and inspection*

After all tests have been completed, dismantle the joints, clean and inspect the fittings and report any damage or corrosion observed.

A.4 Results

Report whether the test assemblies held pressure or leaked during the tests carried out as described in **A.3.1** to **A.3.5**. Also report whether any damage or corrosion to the fittings was detected during the inspection of **A.3.6**

Appendix B Corrosion test

B.1 Apparatus

B.1.1 *Tall form glass beaker*, of 100 mL capacity.

B.1.2 *Metal strips*, of commercial copper, brass, aluminium and low carbon steel, not less than 0.5 mm thick, cut into pieces 75 mm long and 13 mm wide.

B.1.3 *Spatula.*

B.1.4 *Oven*, capable of maintaining a temperature of 65 ± 1 °C.

B.1.5 *Clean pair of forceps*.

B.2 Materials

B.2.1 *Emery paper*, No. 150 grade.

B.2.2 *1,1,1-trichloroethane*, as specified in BS 4487.

B.2.3 *Industrial methylated spirit*, as specified in BS 3591.

B.2.4 *Cotton wool*.

B.3 Preparation of metal strips

Mechanically polish the two faces of each strip (**B.1.2**) to obtain a uniform finish free from defects. Clean and polish each strip with the emery paper (**B.2.1**) and then with successive pads of cotton wool until a fresh pad remains unsoiled after use. Wash each strip with 1,1,1-trichloroethane (**B.2.2**) and allow to dry. Use clean forceps (**B.1.5**) for all further handling of the strips.

B.4 Procedure

Fill the beaker (**B.1.1**) with a sample of the jointing compound to within 6 mm of the top, level and smooth the surface with the spatula (**B.1.3**). Coat each freshly prepared strip with a thin film of the sample for a distance of 48 mm from one end and insert that end vertically to a depth of 50 mm into the sample of jointing compound contained in the beaker. Press the surface of the sample into contact with the strip and level it again with the spatula. Place the beaker in an oven (**B.1.4**) controlled at 65 ± 2 °C.

Remove the beaker after 168 h and withdraw the strips. Wipe them with cotton wool (**B.2.4**) and wash them in industrial methylated spirit (**B.2.3**). Examine the surface for etching, pitting, discolouration, bloom or corrosion deposits.

B.5 Results

Report the state of the strips in terms of any visible etching, pitting, discolouration or corrosion deposits.

Publication(s) referred to

BS 21, *Specification for pipe threads for tubes and fittings where pressure-tight joints are made on the threads (metric dimensions).*

BS 1387, *Specification for screwed and socketed steel tubes and tubulars and for plain end steel tubes suitable for welding or for screwing to BS 21 pipe threads.*

BS 2000, *Methods of test for petroleum and its products.*

BS 2000-170, *Flash point by the Abel apparatus (non-statutory method).*

BS 2874, *Specification for copper and copper alloy rods and sections (other than forging stock).*

BS 3591, *Specification for industrial methylated spirits.*

BS 4487, *Specification for inhibited 1,1,1-trichloroethane (methylchloroform).*

BS 4947, *Specification for test gases for gas appliances.*

BS 5292, *Specification for jointing materials and compounds for installations using water, low-pressure steam or 1st, 2nd and 3rd family gases*[4)].

BS 6920, *Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water.*

BS 6920-1, *Specification.*

[4)] Referred to in the foreword only.

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