

Specification for

Joints and fittings for use with unplasticized PVC pressure pipes —

**Part 2: Mechanical joints and fittings,
principally of unplasticized PVC**

UDC 621.643.4:678.743.22

Co-operating organizations

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

- Board of Trade
- British Electrical and Allied Manufacturers' Association
- British Plastics Federation*
- Electrical Research Association
- Engineering Equipment Users' Association*
- Ministry of Defence, Army Department*
- Ministry of Defence, Navy Department*
- Ministry of Public Building and Works, Building Research Station*
- Ministry of Technology
- Oil Companies Materials Association*
- Plastics Institute
- Post Office
- Royal Institute of British Architects*
- Royal Institute of Public Health & Hygiene
- Rubber and Plastics Research Association of Great Britain
- Society of Motor Manufacturers and Traders Ltd.
- Surface Coating Synthetic Resin Manufacturers' Association

The Government departments and scientific and industrial 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 Industrial Biological Research Association
- British Mechanical Rubber Manufacturers' Association
- British Rubber Manufacturers' Association Ltd.
- British Waterworks Association
- Chemical Industries Association
- Copper Tube Fittings Manufacturers' Association
- Food Manufacturers' Federation Incorporated
- Gas Council
- Gas List Tube Association
- Institute of Brewing
- Institute of Plumbing
- Institution of Civil Engineers
- Institution of Municipal Engineers
- Institution of Public Health Engineers
- Institution of Water Engineers
- Lloyd's Register of Shipping
- Ministry of Agriculture, Fisheries and Food
- Ministry of Housing and Local Government
- Ministry of Public Building and Works
- National Brassfoundry Association
- National Coal Board
- National Federation of Plumbers and Domestic Heating Engineers
- Plastic Pipe Manufacturers' Society
- Water Companies Association
- Water Research Association

This British Standard, having been approved by the Plastics Industry Standards Committee, was published under the authority of the Executive Board on 30 November 1970

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Foreword

This standard makes reference to the following British Standards:

BS 903, *Methods of testing vulcanized rubber — Part A26: Determination of hardness*.

BS 2474, *Recommended names for chemicals used in industry*.

BS 2494, *Elastomeric joint rings for pipework and pipelines*.

BS 2782, *Methods of testing plastics*.

BS 3505, *Unplasticized PVC pipe for cold water services*.

BS 3506, *Unplasticized PVC pipe for industrial uses*.

BS 9001, *Sampling procedures and tables for inspection by attributes for electronic parts of assessed quality*.

This British Standard has been prepared under the authority of the Plastics Industry Standards Committee.

Where appropriate the requirements including those for effect on water are the same as those specified in BS 3505¹⁾ and have been updated to enable joints and fittings complying with this British Standard to be acceptable to UK water undertakings.

Attention is drawn to CP 312²⁾ which has been prepared to assist users in assessing the suitability of plastics pipes for particular purposes and to ensure their proper application.

Part 1 of this standard specifies requirements for injection moulded unplasticized PVC fittings for solvent welding for use with pressure pipes, including potable water supply. Part 3 of this standard specifies requirements for solvent cements and solvent welded joints.

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 10, 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⁾ BS 3505, “Unplasticized PVC pipe for cold water services”.

²⁾ CP 312, “Plastics pipework (thermoplastic material)”, Part 1: “General principles and choice of material”, Part 2: “Unplasticized PVC”.

1 Scope

1.1 This British Standard specifies requirements for mechanical joints and fittings of the push-fit type made principally from unplasticized polyvinyl chloride, and of which one or more of the joints is intended for use with unplasticized polyvinyl chloride pressure pipes complying with BS 3505³⁾ and BS 3506⁴⁾.

1.2 Joints complying with this standard may be either purpose-made sockets formed on the pipes themselves, or detachable couplers and other fittings which may either be formed from pipe or injection moulded. Typical joints are shown in Figure 1.

2 Material

2.1 The material from which the fittings are made shall consist substantially of polyvinyl chloride to which may be added only those additives that are needed to facilitate the manufacture of the polymer and of sound fittings, with good surface finish, mechanical strength and opacity. None of these additives shall be used separately or together in quantities sufficient to constitute a toxic hazard, or to impair the chemical and physical properties of the fittings as defined in this standard.

The pipe from which fittings are formed shall comply with BS 3505³⁾ except that it need not comply in respect of dimensions.

NOTE Although the more stringent requirements of BS 3505 are not necessary for fittings used with pipe complying with BS 3506, “Unplasticized PVC pipe for industrial uses”, it has been decided to avoid possible confusion by requiring all fittings to be of the same material.

2.2 *Text deleted.*

2.3 The deformation temperature of the material under load shall not be lower than 72 °C when tested in accordance with BS 2782:Method 120B⁵⁾.

3 Dimensions

3.1 Insertion lengths. Insertion lengths of joints not strong in tension (i.e. rubber ring joints) shall be not less than the appropriate length shown below (the insertion length is defined as the distance between the sealing plane and the register in the root of the socket, or the beginning of any chamfer that acts as a pipe stop; see Figure 1):

Type of joint	Minimum insertion length
Single ended	50 mm + 0.22D
Double ended	30 mm + 0.15D

where D = mean outside diameter of the pipe for which the fitting is designed.

NOTE These socket depths are intended, for example, for use with pipe of 12 m maximum lengths for underground cold water supply.

3.2 Flanges. *(Text deleted)*

4 Performance requirements

4.1 Unplasticized PVC fittings. The requirements of this clause shall apply only to those parts of the joint or fitting that are made of unplasticized PVC. Injection moulded parts shall comply with the requirements specified in 4.2.1, 4.3, 4.4 and 4.5. Parts formed from pipe, or formed on the end of pipe, shall comply with the requirements specified in 4.2.2 and 4.4. The pipe used for this purpose shall comply with BS 3505³⁾ except in respect of dimensions (see 2.1).

NOTE Fittings made from pipe complying with the requirements of BS 3505 “Unplasticized PVC pipe for cold water services” need not be retested for opacity (4.4) or effect on water (4.5).

4.2 Forming quality (batch test requirement)

4.2.1 Stress relief requirement (for injection moulded parts only). When tested by the method described in Appendix A, none of the specimens tested shall show blisters, excessive delamination or cracking, or signs of weld line splitting. The weld line or lines may become more pronounced during the test, but this shall not be deemed to constitute failure.

Special care shall be taken in examining the area around the point of injection, where no cracks or delaminations shall penetrate to a depth greater than 20 % of the wall thickness at that point. The assessment of the depth of penetration of cracks or delaminations shall be carried out by sectioning the specimen at the point of injection and measuring the depth to which these defects penetrate the wall thickness of the fitting.

4.2.2 Forming faults (for parts formed by post forming extruded pipe only). No voids or cracks shall be found by sectioning the fitting longitudinally and across its major axes, i.e. at the point where the degree of expansion from the original pipe diameter is greatest.

Alternatively testing by X-ray or ultrasonic methods may be used by agreement between the purchaser and the manufacturer.

³⁾ BS 3505, “Unplasticized PVC pipe for cold water services”.

⁴⁾ BS 3506, “Unplasticized PVC pipe for industrial uses”.

⁵⁾ BS 2782, “Methods of testing plastics”.