

Thermoplastics pipes and associated fittings for hot and cold water for domestic purposes and heating installations in buildings —

Part 2: Specification for polybutylene (PB) pipes and associated fittings

ICS 83.140.30; 91.140.60

Committees responsible for this British Standard

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

- British Board of Agrément
- British Gas plc
- British Plastics Federation
- British Plumbing Fittings Manufacturers' Association
- British Valve and Actuator Manufacturers' Association
- Department of the Environment (Building Research Establishment)
- Department of the Environment (Construction Industries Directorate)
- Department of the Environment (Property Services Agency)
- Department of Transport
- Electricity Supply Industry in England and Wales
- Engineering Equipment and Materials Users' Association
- Health and Safety Executive
- Institute of Building Control
- Institution of Civil Engineers
- Institution of Gas Engineers
- Institution of Production Engineers
- Institution of Water and Environmental Management
- National Association of Plumbing, Heating and Mechanical Services Contractors
- Plastics and Rubber Institute
- Plastics Land Drainage Manufacturers' Association
- Royal Institute of Public Health and Hygiene
- Society of British Gas Industries
- Society of British Water Industries
- Water Companies Association
- Water Research Centre
- Water Services Association of England and Wales

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Heating and Ventilating Contractors' Association
- Institute of Domestic Heating and Environmental Engineers

This British Standard, having been prepared under the direction of the Plastics Standards Policy Committee, was published under the authority of the Board of BSI and comes into effect on 31 May 1990

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Foreword

This Part of BS 7291 has been prepared under the direction of the Plastics Standards Policy Committee.

It specifies, in accordance with Part 1 of BS 7291, specific requirements for pipes made of polybutylene and associated fittings intended for systems based on pipes having a nominal outside diameter between 10 mm and 35 mm inclusive for the use of hot and cold water for domestic purposes, including heating. It includes material requirements, dimensions, mechanical properties and performance requirements, based on mechanical jointing, to supplement the general requirements of Part 1, which are also applicable. However, it may be noted that it is possible to joint polybutylene pipes by thermal fusion. If thermal fusion fittings are developed for use with pipe complying with this Part of BS 7291, it is intended that this Part will be amended as necessary to include any material-related requirements for such joints and fittings.

This Part of BS 7291 provides for pipes dimensioned to suit two established metric series, being BS 5556 for thermoplastics pipes generally and BS 2871, for compatibility with copper pipework systems widely used for these applications.

No dimensional requirements are specified for fittings, because the performance requirements included for fittings when tested individually or in assemblies with pipe are intended to ensure that the dimensions of the fittings are satisfactory for jointing purposes and pressure containment.

Attention is drawn to BS 7291-3, which gives corresponding requirements for cross linked polyethylene (PE-X) pipes and associated fittings, and to BS 7291-4, which gives corresponding requirements for chlorinated polyvinyl chloride (PVC-C) pipes and associated fittings and solvent cement.

Attention is also drawn to BS 5955-8, which gives requirements and guidance on the correct application and installation of thermoplastics pipes and fittings for the conveyance of domestic hot and cold water.

In preparing this British Standard, account has been taken of concurrent work by Technical Committee 138 of the International Organization for Standardization (ISO), but that work is not yet sufficiently advanced or aligned with the philosophies in this standard for use in its place.

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 technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier's quality system against the appropriate Part of BS 5750.

Enquiries as to the availability of third party certification schemes will be forwarded by BSI to the Association of Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

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 8, 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.

Section 1. General

Before reading this Part, it is essential to read BS 7291-1, issued separately.

1 Scope

This Part of BS 7291 specifies requirements for polybutylene (PB) pipes and associated fittings intended for the conveyance of cold water, including potable water, and heated water, for use in domestic hot and cold water distribution and heating installations within buildings. These requirements supplement the general requirements in Part 1¹⁾ of BS 7291, which are also applicable.

It gives general requirements for materials to be used for or in the form of PB pipes or associated fittings and components, and specific requirements for PB pipe and for push-fit and compression fittings complying with this Part or with other Parts of BS 7291 or other British Standards and intended for use with pipes complying with this Part.

The dimensions of the pipes specified range from 10 mm to 35 mm outside diameter inclusive, in accordance with either BS 5556 (metric series for thermoplastic pipes) or BS 2871 (metric series for copper tubes).

Methods of test, associated guidance and information on quality control testing are given in appendices.

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

2 Materials

2.1 PB base material

The material from which the PB pipe and the bodies of PB fittings are manufactured shall comprise heat-stabilized PB prepared by the polymerization of not less than 85 % butene-1 and not less than 95 % of total olefins by mass; it shall otherwise contain only pigment and those additives that are needed for its manufacture and subsequent conversion into pipes and/or fittings complying with this Part of BS 7291.

When the base material is tested in accordance with Appendix A, the increase in melt flow rate after thermal ageing shall be not greater than 200 %.

2.2 Reworked material

If reworked material is used in the manufacture of PB pipes or of associated PB or PVC-C fittings otherwise complying with this Part or Part 4 of BS 7291, as applicable, it shall comprise the manufacturer's own clean reworked material and be of the same grade as any material to which it is added. No other reworked material shall be admissible.

2.3 Other materials

If materials other than those complying with 2.1 or 2.2 are used for component parts of fittings, e.g. compression rings, or fittings, the complete fitting shall comply with clauses 7 to 10 inclusive as applicable.

2.4 Material in the form of pipe or fittings

2.4.1 Opacity

PB pipe and associated fittings shall comply with 5.7 of Part 1.

2.4.2 Pigmentation

For thermoplastics components, when tested in accordance with BS 2782:Method 1106A:1983, any pigment dispersion shall be at least as uniform as that shown in photomicrograph 2 of Figure 1 of BS 2782:Method 1106A:1983, i.e. appearances similar to those shown in photomicrographs 3 to 6 of that figure shall be unacceptable.

NOTE No range of colour(s) is specified for pipes or fittings complying with this Part of BS 7291 but attention is drawn to 2.4.1, which may be satisfied through incorporation of pigment(s).

2.4.3 Effect of materials on the quality of potable water

Pipes and fittings shall comply with 5.1 of Part 1, as applicable.

2.4.4 Effect of materials on the reactivity of recirculated water

The manufacturer shall identify in accordance with 5.2.1 of Part 1 any constituent other than polymers of butene-1 or other olefins that may be leached from the PB pipe or fittings when used in any application for which the class of the pipe or fitting is suitable, and means by which such leaching shall be prevented or controlled.

Pipes and fittings of PB are to some extent permeable to oxygen; hence if they are used for the primary circuit(s) of a heating system, it may be desirable to add a corrosion inhibitor to the fluids circulating therein, in which case the manufacturer(s) of the pipe and/or fitting shall upon request provide appropriate advice in accordance with BS 5955-8. This advice shall include selection of a compatible corrosion inhibitor and/or methods for reducing the permeability.

NOTE Permeability may be reduced through the use of compatible coatings to provide a permeation barrier. The use of such coatings may be applicable to other parts of the system circuits.

2.4.5 Long-term hydrostatic strength

When tested with or without a coating as applicable (see 2.4.4 and 2.5), pipes shall comply with 5.3 of Part 1.

¹⁾ In this standard, all specific references to Part 1 relate to BS 7291-1:1990.