

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

Part 1: General requirements

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- 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
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- 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.

The purpose of this Part of BS 7291 is to establish a specification for general requirements for pipes made from thermoplastics materials and associated fittings for use for hot water under pressure for domestic purposes, including potable water and water for heating purposes.

This specification is applicable to pipes of up to and including 67 mm nominal outside diameter and associated fittings. Particular ranges of sizes are specified with reference to BS 5556 and/or to BS 2871 and BS 864 as appropriate by the other Parts of BS 7291. These alternative size ranges arise because in addition to providing for specifications in accordance with BS 5556 for metric sizes of plastics pipes, it is considered desirable to standardize the requirements for plastics pipes made and widely used for such applications with dimensions compatible with pipework, fittings and accessories for metric sizes of copper pipes.

Complementary requirements for pipes and fittings made from particular types of thermoplastics materials are given in other Parts of BS 7291; in particular, those Parts specify requirements and test methods appropriate to ensure the quality of the material and the performance of pipes and fittings of that material and specify component dimensions which contribute to the performance. Those Parts also rationalize the pipe sizes specified and identify suitable jointing methods. Since dissimilar materials may be incompatible, the guidance of the manufacturer should be sought before jointing pipes or fittings of such materials.

Fittings may also be made of plastics materials other than those from which the pipes are made or of other materials, e.g. metallic fittings complying with BS 864-2, subject to compliance with this Part of BS 7291 and with any applicable requirements for jointed assemblies given in the other relevant Part of BS 7291.

The following Parts are published simultaneously with this Part of BS 7291:

- *Part 2: Polybutylene (PB) pipes and associated fittings;*
- *Part 3: Crosslinked polyethylene (PE-X) pipes and associated fittings;*
- *Part 4: Chlorinated polyvinyl chloride (PVC-C) pipes and associated fittings and solvent cement.*

Attention is drawn to BS 5955-8 which specifies the installation requirements for plastics pipes and associated fittings falling within the scope of BS 7291, and reference therein to other relevant codes of practice and specifications.

When used as piping for a domestic hot water primary circuit it is possible for chemicals which are deleterious to other systems components to be leached out of the pipework. These chemicals can then be transported through the system and may cause degradation of other components of the system. In the case of PVC-C, referred to in Part 4 of BS 7291, chlorine can be so leached, and measurements of the levels of chloride leaching should be made using the method given in Part 4.

Similar deleterious effects on other system components can occur if gases, such as oxygen, can permeate the pipework and thus enter the primary circuit. In the case of PE-X and PB, referred to in Parts 2 and 4 of BS 7291, it is known that the pipes are to some extent permeable to gases. At present there is no suitable method for accurately determining the permeability of pipework and thus no test or acceptance level can be specified in this standard. In order to overcome the deleterious effect such gases can have on system components a corrosion inhibitor should be added to the primary circuit. If an inhibitor is to be used note should be taken of advice given in BS 5955-8.

In preparing BS 7291, account has been taken of concurrent work by Technical Committee 138 of the International Organization for Standardization (ISO), which is not yet sufficiently advanced or aligned with the philosophies in this standard for use in its place.

Attention is drawn to the provisions of the Health and Safety at Work etc. Act 1974 and the need for appropriate precautions to be taken to ensure the safety of personnel when carrying out the methods of test required by this standard.

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 to iv, pages 1 to 14, 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 Scope

This Part of BS 7291 specifies general requirements for thermoplastics pipes and/or fittings intended for use within domestic buildings, or for domestic purposes in other buildings, for conveyance of water, under pressure ¹⁾, for distribution of hot and cold water, including potable water, and for circulation of hot water for heating purposes. Details of specific applications and service conditions are given in Table 2.

This specification is applicable to rigid or flexible pipes, plain or externally coated, having a nominal outside diameter of up to and including 67 mm.

The pipes may carry an external coating, to inhibit gas permeability through the pipe wall.

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

Other Parts of BS 7291 specify additional requirements for pipes and/or fittings manufactured from specific thermoplastics materials. They should be read in conjunction with this Part of BS 7291.

NOTE The titles of publications referred to in this Part of BS 7291 are listed on the inside back cover.

2 Definitions

For the purposes of BS 7291 the definitions given in BS 1755-1 and BS 4118 apply, together with the following.

2.1

flexible pipes

pipes available in coil form

2.2

maximum system service temperature (T_s)

the maximum service temperature that can occur during normal operation because, for example, of thermal stratification within hot water storage vessels or of the positioning and/or operating tolerances of temperature controls

2.3

nominal system flow temperature (T_f)

the intended maximum flow temperature of a system for a particular application as recommended in codes of practice and other guidance documents

2.4

rigid pipes

pipes available in straight lengths

2.5

system malfunction temperature (T_m)

the maximum temperature likely to be applied to pipes and fittings in the event of control thermostat failure or malfunction

3 Classifications

Pipes and fittings shall be classified as given in Table 1 with reference to their intended applications by symbols for which the corresponding purposes and service conditions are given in Table 2.

Table 1 — Classification by application

Class	Applications
W	A, B, C
H	A, B, C, D, E, F
S	A, B, C, D, E, F, G

NOTE The requirements and references to associated test methods for establishing acceptable performance for each class, with the appropriate factors of safety, are given in clause 5; in particular 5.3, 5.4 and 5.5 discriminate between the classes.

4 Dimensions

4.1 General

Subject to 4.2 and 4.3, the dimensions and their tolerances for specific pipes shall be as given in the other Parts of this standard and shall be compatible with either:

- outside diameters up to and including 63 mm for pipe systems in accordance with BS 5556; or
- compression fittings in accordance with BS 864-2 to suit sizes of tube up to and including 67 mm in accordance with BS 2871-1.

NOTE 1 The sizes adopted for a specific Part may be selected from either or both of the ranges in a) and b).

NOTE 2 The dimensions and associated tolerances for fittings to suit a given pipe and application are not specified but are controlled by the need for compliance with the performance requirements of this Part and of the other Part of BS 7291 applicable to the relevant pipe. The method of designating the size or pattern of a fitting is given in 6.6.

4.2 Wall thickness of pipes

When determined in accordance with BS 2782:Method 1101A, the wall thickness of pipe shall be not less than one eleventh of the outside diameter, subject to a minimum value of 1.5 mm.

¹⁾ Reference to pressure in this Part of BS 7291 means gauge pressure unless otherwise stated.