

Plastics piping systems — Thermoplastics piping systems for soil and waste discharge — Test method for airtightness of joints

The European Standard EN 1054 : 1995 has the status of a
British Standard

ICS 23.040.20; 23.040.90; 91.140.80

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PRI/61, Plastics piping systems and components, upon which the following bodies were represented:

- British Gas plc
- British Plastics Federation
- British Plumbing Fittings Manufacturers' Association
- British Valve and Actuator Manufacturers' Association
- Department of the Environment (British Board of Agrément)
- Department of the Environment (Building Research Establishment)
- Department of the Environment (Property and Buildings Directorate)
- Department of Transport
- Electricity Association
- Federation of Civil Engineering Contractors
- Health and Safety Executive
- Institute of Building Control
- Institute of Materials
- Institution of Civil Engineers
- Institution of Gas Engineers
- Institution of Water and Environmental Management
- National Association of Plumbing, Heating and Mechanical Services Contractors
- Pipeline Industries Guild
- Plastics Land Drainage Manufacturers' Association
- Society of British Gas Industries
- Society of British Water Industries
- Water Companies' Association
- Water Services Association of England and Wales

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

- Engineering Equipment and Materials Users' Association
- ERA Technology Ltd.
- RAPRA Technology Ltd.

This British Standard, having been prepared under the direction of the Sector Board for Materials and Chemicals, was published under the authority of the Standards Board and comes into effect on 15 August 1996

© BSI 1996

The following BSI references relate to the work on this standard:
Committee reference PRI/61
Draft for comment 93/305477 DC

ISBN 0 580 25541 7

Amendments issued since publication

Amd. No.	Date	Text affected

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Foreword	2
Method	
1 Scope	3
2 Principle	3
3 Apparatus	3
4 Test pieces	3
5 Procedure	4
6 Test report	4
Figures	
1 Typical arrangement	3
2 Directions of deflection	5

National foreword

This British Standard has been prepared by Technical Committee PRI/61 and is the English language version of EN 1054 : 1995 *Plastics piping systems — Thermoplastics piping systems for soil and waste discharge — Test method for airtightness of joints*, published by the European Committee for Standardization (CEN).

It is incorporated into BS 2782 *Methods of testing plastics: Part 11: Thermoplastics pipes, fittings and valves*, as Method 1112C : 1996, for association with related test methods for plastics materials and plastics piping components.

This test method has been prepared for reference by other standards under preparation by CEN for specification of plastics piping systems and components. It has been implemented to enable experience of the method to be gained and for use for other fresh applications.

It is also for use for the revision or amendment of other national standards as practicable, but it should not be presumed to apply to any existing standard or specification which contains or makes reference to a different test method until that standard/specification has been amended or revised to make reference to this Method. No existing British Standard is superseded by this Method.

Warning note. This British Standard, which is identical with EN 1054 : 1995, does not necessarily detail all the precautions necessary to meet the requirements of the Health and Safety at Work etc. Act 1974. Attention should be paid to any appropriate safety precautions and the method should be operated only by trained personnel.

Attention is drawn to the descriptor 'gas permeability' which is misleading. This method is a test for the leaktightness of a joint, it does not give any assessment of permeability through any material.

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

ICS 23.040.20

Descriptors: Sanitation, water removal, sewage, buildings, interior, plastic tubes, thermoplastic resins, leak tests, gas permeability, verification

English version

Plastics piping systems — Thermoplastics piping systems for soil and waste discharge — Test method for airtightness of joints

Systèmes de canalisations en plastiques —
Systèmes de canalisations thermoplastiques pour
évacuation des eaux-vannes et des eaux usées —
Méthode d'essai de l'étanchéité à l'air des jonctions

Kunststoff-Rohrleitungssysteme —
Rohrleitungssysteme aus Thermoplasten für
Abwasserleitungen zum Ableiten von häuslichem
Abwasser — Prüfverfahren für die Dichtheit gegen
Gas von Verbindungen

This European Standard was approved by CEN on 1995-10-05. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

This European Standard was prepared by the Technical Committee CEN/TC 155, Plastics piping systems and ducting systems, of which the secretariat is held by NNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 1996, and conflicting national standards shall be withdrawn at the latest by April 1996.

According to CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This standard is based on annex C 'Airtightness test' of ISO 3633 : 1991 *Unplasticized poly(vinyl chloride) (PVC-U) pipes and fittings for soil and waste discharge (low and high temperature) systems inside buildings — Specifications*, published by the International Organization for Standardization (ISO). It is a modification of annex C for reasons of applicability to other plastics materials and/or other test conditions and alignment with texts of other standards on test methods.

The modifications are:

- no material is mentioned;
- test parameters, except those common to all plastics, are omitted;
- no diameter limit is included;
- no material-dependent requirements are given;
- editorial changes have been introduced.

The material-dependent parameters and/or performance requirements are incorporated in the system standard(s) concerned.

No existing European Standard is superseded by this standard.

This standard is one of a series of standards on test methods which support system standards for plastics piping systems and ducting systems.

1 Scope

This standard specifies a method for testing the airtightness of joints of thermoplastics piping systems for soil and waste discharge inside buildings.

2 Principle

A test assembly of pipes and/or fittings is subjected to a given internal air pressure for a given period during which the leaktightness of the joint is verified by inspection.

NOTE. It is assumed that the following test parameters are set by the standard making reference to this standard:

- a) the sampling procedure (see 4.1);
- b) the number of test pieces (see 4.2).

3 Apparatus

3.1 End-sealing devices, having a size and using a sealing method both appropriate to the type of joint assembly under test. The devices shall be restrained in a manner that does not exert longitudinal forces on the joint assembly and that prevents the devices or the assembly under test from separating under pressure. The weight of the devices shall not be allowed to influence the angular deflections to be applied (see 5.8).

3.2 Air pressure source, connected via a shut-off valve to one end of at least one end-sealing device, and capable of maintaining the required pressure within $\pm 10\%$ (see clause 5).

3.3 Pressure measuring device, capable of checking conformity to the required test pressure (see 3.2 and clause 5).

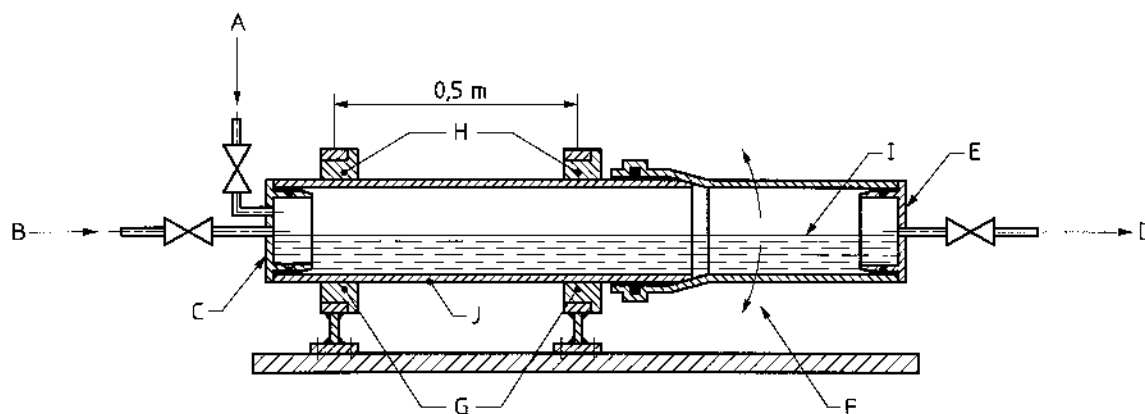
3.4 Water supply and outlet devices, each connected via a shut-off valve to at least one end-sealing device to admit water to the appropriate level within the test piece (see figure 1).

4 Test pieces

4.1 Preparation

The test piece shall comprise an assembly of (a) pipe section(s) (with or without sockets) and/or fitting(s), one part of the test piece being a pipe or a fitting with a spigot mounted in two clamped blocks (see figure 1).

One end of the pipe shall be sealed with a plug that has a combined water and air inlet. A fitting or a joint shall be assembled with the open end of the fixed component. The fitting or joint shall then be sealed at all open ends with plugs, one of which has a centrally mounted water outlet and shut-off valve (see figure 2).



Dimensions in metres

- A Air inlet
- B Water inlet
- C Sealing plug with water inlet, air inlet and end restraint
- D Water outlet
- E Sealing plug with water outlet and end restraint (see 3.1)
- F Direction of movement for angular deflection, if applicable (see 5.8)
- G Loose bushes to allow all sizes of pipes to be accommodated on the same test fixture
- H Fixed points
- I Level of water for test (half of pipe internal bore)
- J Fixed component

Figure 1. Typical arrangement

The assembly of the joint(s) shall be carried out in accordance with the manufacturer's instructions.

The assembly shall comprise the combination of the smallest available spigot end and the largest available socket or socket groove diameter within the applicable tolerance(s) and obtained by sampling in accordance with the referring standard.

The relevant diameters of the selected spigot(s) and socket(s) shall be measured and recorded.

4.2 Number

The number of test pieces shall be as specified in the referring standard.

5 Procedure

5.1 Carry out the following procedure at ambient temperatures of $(23 \pm 5)^\circ\text{C}$ using cold tap water.

5.2 Mount the test piece horizontally in the apparatus (see figure 1).

5.3 When testing in accordance with **5.4** to **5.8** monitor the joint for and record any leaks which are evident by the formation of bubbles of soap solution (see **5.4**) and/or the escape of water.

5.4 Apply a solution of soapy water or equivalent leak-detecting agent around the annular space between the spigot and the mouth of the socket. Afterwards remove any excess, dripping liquid with a dry cloth.

5.5 Open the water outlet valve and close the air inlet valve.

5.6 Open the water inlet valve. When the assembly is half-full, as indicated by water flow from the outlet, close first the water inlet valve(s) and then the water outlet valve(s).

5.7 Open the air inlet valve and increase the internal air pressure to $(0,1 \pm 0,01)$ bar $[(10 \pm 1)$ kPa] using air at the ambient temperature (see **5.1**).

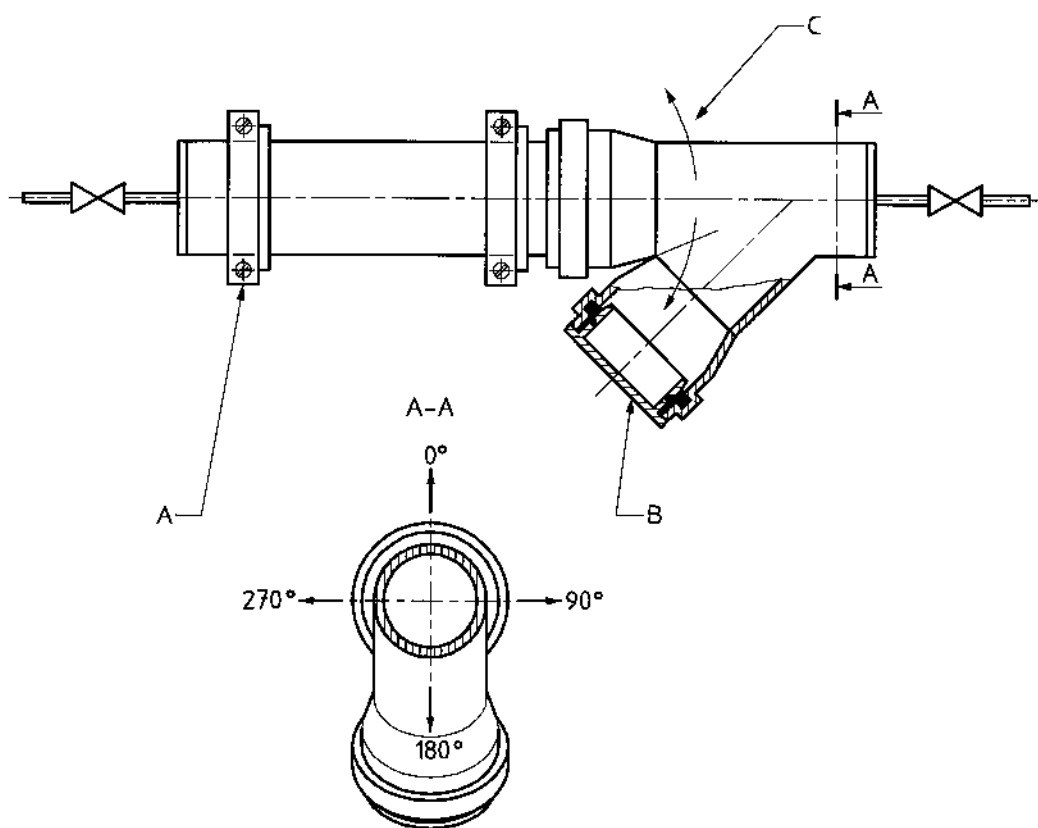
5.8 Maintain this pressure for 5 min, then deflect the fitting or joint manually on the spigot end of the clamped component, until their consecutive axes reach the maximum angular deflection, as declared by the manufacturer for the joint under test. Apply this angular deflection at 0° , 90° , 180° and 270° (see figure 2), maintaining it for 1 min in each of these directions.

5.9 Depressurize, drain and dismantle the test piece. Inspect for and record any changes in the appearance of the components tested.

6 Test report

The test report shall include the following information:

- a) a reference to this standard and to the referring standard;
- b) the identity of the components (e.g. fitting(s), pipe(s), seal(s) comprising the joint(s) under test) and their respective diameters, in millimetres (see **4.1**);
- c) the ambient temperature, in degrees Celsius (see **5.1**);
- d) the test pressure, in bars;
- e) the length of time under pressure, in minutes;
- f) if applicable, the angle of deflection applied to the joint (see **5.8**);
- g) a statement, that the joint did not leak or, if any, a report of signs of leakage or rupture, their position(s) and the pressure at which they occurred;
- h) any changes in the appearance of the components of the test piece(s) during the test, or immediately afterwards;
- i) any factors which may have affected the results, such as any incidents or any operating details not specified in this standard;
- j) the date of the test.



End elevation (indicating directions of deflection during the test)

- A Blocks split and held together with wing-nut
- B Sealing plug
- C Directions of movement of fitting during test

Figure 2. Directions of deflection

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: 020 8996 9001. Fax: 020 8996 7001.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: 020 8996 7111. Fax: 020 8996 7048.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: 020 8996 7002. Fax: 020 8996 7001.

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI.

This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained.

If permission is granted, the terms may include royalty payments or a licensing agreement. Details and advice can be obtained from the Copyright Manager. Tel: 020 8996 7070.