

Plastics piping systems — Thermoplastics piping systems for non-pressure applications — Test method for watertightness

The European Standard EN 1053 : 1995 has the status of a
British Standard

ICS 23.040.20

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by 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

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The following BSI references relate to the work on this standard:
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National foreword

This British Standard has been prepared by Technical Committee PRI/61 and is the English language version of EN 1053 : 1995 *Plastics piping systems — Thermoplastics piping systems for non-pressure applications — Test method for watertightness*, 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 1112B : 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. This Method supersedes BS 2782 : Part 11 : Method 1112A : 1989, which becomes obsolescent except for supporting references thereto in BS 4576 : Part 1 : 1989, BS 4660 : 1989 and BS 5255 : 1989.

The principal technical differences between EN 1053 : 1995 and BS 2782 : Part 11 : Method 1112A : 1989 are as follows.

	Parameter	EN 1053 : 1995	BS 2782 : Part 11 : Method 1112A : 1989
a)	Ambient temperature during test piece assembly and testing	(23 ± 5) °C	15 °C to 35 °C
b)	Angular deflection applied to the joint under test	Yes, if deflection is possible, to maximum declared for the joint by its manufacturer	Not specifically required, unless specified by the product specification
c)	Period for raising the pressure to the test pressure of ≥ 0,5 bar	‘smoothly over not greater than 15 min’	Not specified
d)	Period for which a test pressure of ≥ 0,5 bar is maintained	‘at least 15 min’	‘not less than 60 s’
e)	Inspection for and report of any change in appearance (other than leakage)	Yes	Not called for

Warning note. This British Standard, which implements EN 1053 : 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 test method should be operated only by trained personnel.

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, water-tightness verification

English version

Plastics piping systems — Thermoplastics piping systems for non-pressure applications — Test method for watertightness

Systèmes de canalisations en plastiques —
Systèmes de canalisations thermoplastiques pour
applications sans pression — Méthode d'essai de
l'étanchéité à l'eau

Kunststoff-Rohrleitungssysteme —
Rohrleitungssysteme aus Thermoplasten für
drucklose Anwendungen — Prüfverfahren auf die
Wasserdichtheit

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 has been 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 B 'Watertightness 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 B 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 method has been extended to cover quick testing of fabricated products made from more than one piece.

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

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 test method for watertightness of:

- a) joints of thermoplastics piping systems for non-pressure applications;
- b) thermoplastics fabricated products made from more than one piece for non-pressure applications.

2 Principle

A test assembly comprising either a fabricated product or an assembly of pipes and/or fittings is subjected to a given internal hydrostatic pressure for a given period during which the leaktightness of the fabricated product or 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 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 deflection to be applied (see 5.2).

3.2 Hydrostatic pressure source, connected to one end of at least one end-sealing device, capable of applying the required pressure gradually and evenly in accordance with 5.4 and then of keeping it constant to within $\pm 1\%$ for the duration of the test required (see clause 5).

3.3 Bleed valve, capable of venting air when hydrostatic pressure is applied to the test piece.

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

4 Test pieces

4.1 Preparation

The test piece shall comprise either a fabricated fitting or an assembly of (a) pipe section(s) (with or without sockets) and/or fitting(s) including at least one joint of the type under test (see figure 1).

To assist air removal, the test piece may be inclined by up to 12° .

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 an ambient temperature of $(23 \pm 5)^\circ\text{C}$ using cold tap water without permitting any condensation on the surface of the test piece.

5.2 Mount the test piece in the apparatus. If the joint to be tested permits angular deflection, arrange the test assembly so that the joint(s) under test is (are) subject to the (their) maximum angular deflection, as declared for the joint by the manufacturer, for the axes of the components thus joined.

5.3 When testing in accordance with 5.4 and 5.5, monitor the test piece for and record any evidence of leakage.

5.4 Introduce water into the test piece, while bleeding off all air, and apply the hydrostatic pressure as follows:

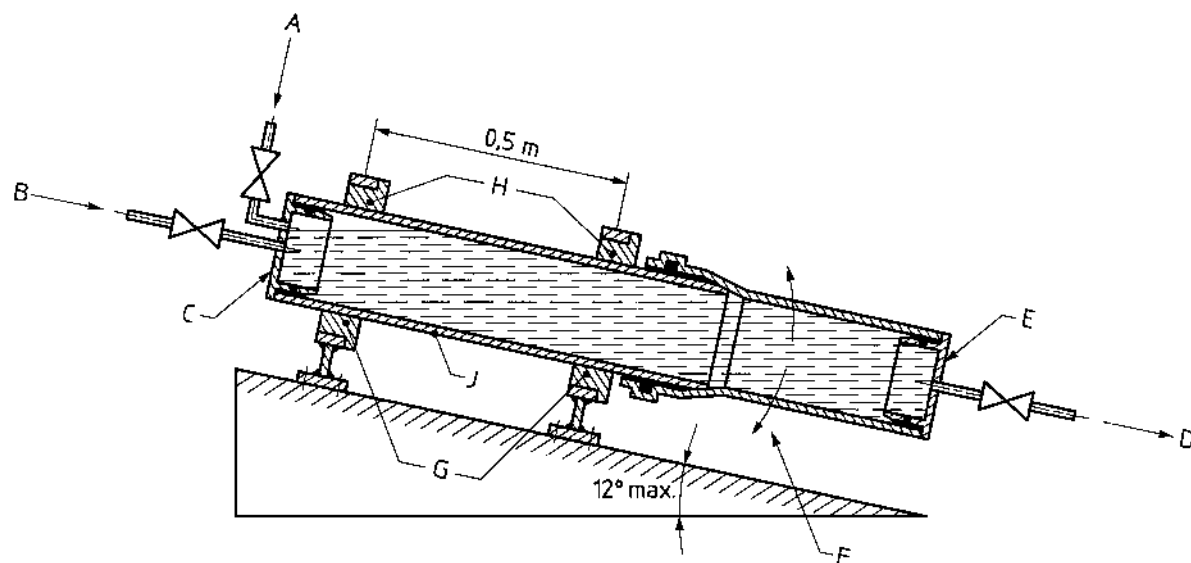
- a) accelerated procedure for fabricated products: unless otherwise specified in the referring standard, apply an hydrostatic pressure of 0,5 bar (50 kPa) and maintain it for at least 1 min.
- b) assemblies of pipes and/or fittings which are not fabricated: raise the hydrostatic pressure smoothly over a period of not greater than 15 min to 0,5 bar (50 kPa) and maintain that pressure for at least 15 min.

5.5 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 identification 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 (see 5.1), in degrees Celsius;
- 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 5.2);
- 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, for example, such as any incidents or any operating details not specified in this standard;
- j) the date of the test.



Dimensions in metres

- A Air outlet
- B Water inlet
- C Sealing plug with water inlet, air outlet 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 5.2)
- G Loose bushes to allow all sizes of pipes to be accommodated on the same test fixture
- H Fixed points
- J Fixed component

Figure 1. Typical arrangement

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