BS EN ISO 3503:2015

BSI Standards Publication

Plastics piping systems — Mechanical joints between fittings and pressure pipes — Test method for leaktightness under internal pressure of assemblies subjected to bending

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National foreword

This British Standard is the UK implementation of EN ISO 3503:2015. It supersedes BS EN 713:1995 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/88/4, Test Methods - Plastic Piping.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Plastics piping systems - Mechanical joints between fittings and pressure pipes - Test method for leaktightness under internal pressure of assemblies subjected to bending (ISO 3503:2015)

Systèmes de canalisations en plastique - Assemblages mécaniques entre raccords et tubes sous pression - Méthode d'essai pour l'étanchéité sous pression interne de montages soumis à une courbure (ISO 3503:2015)

Kunststoff-Rohrleitungssysteme - Mechanische Verbindungen zwischen Fittings und Druckrohren - Prüfverfahren für die Dichtheit von Verbindungen bei Innendruck und gleichzeitiger Biegebeanspruchung (ISO 3503:2015)

This European Standard was approved by CEN on 8 November 2014.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

This document (EN ISO 3503:2015) has been prepared by Technical Committee ISO/TC 138 "Plastics pipes, fittings and valves for the transport of fluids" in collaboration with Technical Committee CEN/TC 155 “Plastics piping systems and ducting systems” the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by September 2015, and conflicting national standards shall be withdrawn at the latest by September 2015.

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Endorsement notice

The text of ISO 3503:2015 has been approved by CEN as EN ISO 3503:2015 without any modification.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 5, *General properties of pipes, fittings and valves of plastic materials and their accessories —Test methods and basic specifications.*

This second edition cancels and replaces the first edition (ISO 3503:1976) which has been technically revised. The reason for modification is for applicability to other plastics materials, other sizes, and/or other test conditions and alignment with texts of other International Standards on test methods.

The modifications are the following:

— no material is mentioned;

— test parameters are omitted, although the original test parameters can be found in Annex A;

— the diameter limit is removed;

— no requirements are given;

— editorial changes have been introduced.

Plastics piping systems — Mechanical joints between fittings and pressure pipes — Test method for leaktightness under internal pressure of assemblies subjected to bending

WARNING — Persons using this document should be familiar with normal laboratory practice, if applicable. The use of this International Standard may involve hazardous materials, operations, and equipment. This International Standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this International Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This International Standard specifies a method for checking the leaktightness under internal pressure of assembled joints between mechanical fittings and plastic pressure pipes when subjected to bending. It defines the calculation method for the average bending radius and how to perform this bending.

Checking of the leaktightness under internal pressure is carried out in accordance with the method given in ISO 3458.

This test method is not applicable to fusion-welded joints.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3458, *Plastics piping systems — Mechanical joints between fittings and pressure pipes — Test method for leaktightness under internal pressure*

3 Principle

Checking of the leaktightness of joints of an assembly, containing one test fitting, to which a bending force is applied throughout its free length (L) under internal pressure.

This bending has an average radius calculated from the pipe nominal diameter and pressure.

4 Test parameters and requirements

The test parameters of the standard which refers to this test standard shall be used and the requirements shall be fulfilled. If one or more parameters are not given in the referring International Standard, the ones given in Annex A shall apply.

The following test parameters should be given by the standard which refers to this test standard:

a) test medium;

b) test pressure (bar or MPa);

c) test duration (h);

d) test temperature (°C);

e) free length (mm);

f) bending radius, *R*

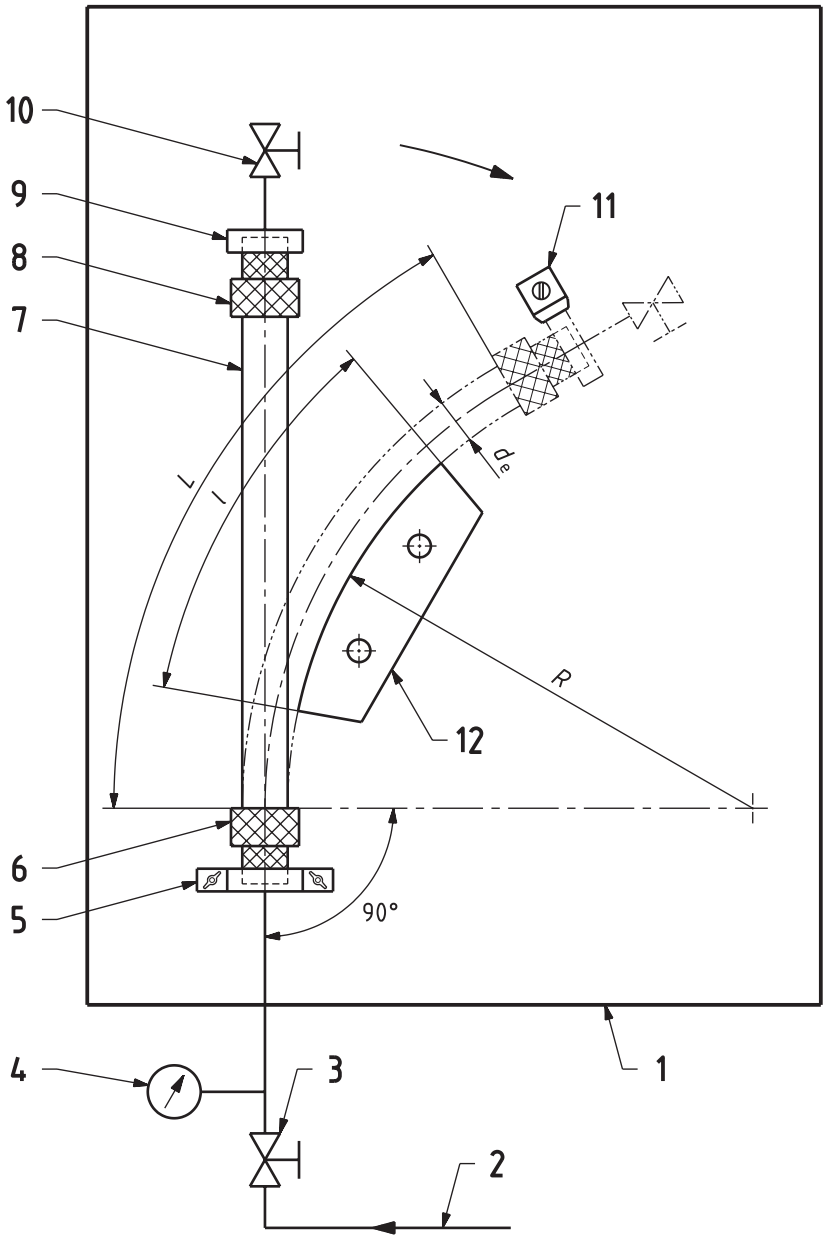
5 Apparatus

5.1 A suitable apparatus is given in Figure 1.

5.2 Bending gauge (12), having a bearing length, *l*, equal to three-quarters of the free length between fittings, i.e. equal to 7,5 times the pipe nominal outside diameter.

This bearing length, *l*, shall have a bending radius equal to that specified for pipe under test.

5.3 Pressurizing system, in accordance with the specification given in ISO 3458.



Key

1	test panel	7	pipe
2	connection pipe to hydraulic pump	8	end fitting (the end fitting is only used for closing the test specimen)
3	valve	9	stop nipple
4	pressure gauge	10	air release valve
5	connection nipple	11	stop block
6	test fitting	12	bending gauge

Figure 1 — Diagram of typical apparatus

6 Test pieces

The test specimen shall consist of a plastic pipe of dimensions conforming to the fittings to be tested.

The fittings and pipes shall not be tested until 24 h after their production. For practical reasons, the manufacturer may wait a shorter time before testing. In case of dispute, a duration of 24 h shall apply.

7 Procedure

The test shall be carried out at a temperature (±2 °C) as specified in the referring International Standard.

Set up the test specimens on the bending gauge in such a way that

— bending stresses are supported by fittings,

— pipe is applied to the bending-gauge's entire length, so that, at either end of it, two free pipe sections equal in length are available, about 1/8 of the free length each, and

— pressure is applied to the mounting according to the specifications of ISO 3458.

8 Test report

The test report shall include the following information:

a) a reference to this International Standard (i.e. ISO 3503:2015) and to the referring International Standard;

b) the nominal pressure class or S series of the components (e.g. fitting(s), pipe) comprising the joint(s) under test;

c) all details necessary for identification of the test pieces, including the nominal size of the pipes and fittings used to produce the test pieces, the type of material and the manufacturer's code;

d) the bending radius;

e) the test medium;

f) the test period;

g) the test pressure;

h) the test temperature;

i) information on the leaktightness of the joint including the pressure at which a leakage occurred (if any);

j) any factors which may have affected the results, such as any incidents or any operating details not specified in this standard;

k) the date of test.

Annex A
(normative)

Test parameters

The test parameters in Table A.1 shall be used, if applicable.

Table A.1 — Test Parameters

Test medium	**Test duration** h	**Test temperature** °C	**Test pressure** MPa
Water	1	23	Three times the nominal design pressure of the lowest rated component in the assembly

After assembly, the pipe shall be such that the free length between fittings is equal to 10 times its nominal diameter. The test shall be carried out with a bending radius, *R*, of

— 15 times the pipe nominal outside diameter, if its nominal pressure is equal to 1 MPa (10 bar) or less, and

— 20 times the pipe nominal outside diameter, with nominal pressure more than 1 MPa (10 bar).

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