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**Plastics piping systems —  
Elastomeric-sealing-ring-type socket  
joints for use with thermoplastic  
pressure pipes — Test method for  
leaktightness under internal pressure  
and with angular deflection**

*Systèmes de canalisations en plastiques — Assemblages par  
emboîture à bague d'étanchéité en élastomère pour les tubes sous  
pression plastiques — Méthode d'essai d'étanchéité sous pression  
interne et avec déviation angulaire*



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Published in Switzerland

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 13845:2000) 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](#);
- editorial changes have been introduced.

# Plastics piping systems — Elastomeric-sealing-ring-type socket joints for use with thermoplastic pressure pipes — Test method for leaktightness under internal pressure and with angular deflection

**WARNING** — Persons using this International Standard 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 testing the leak tightness under internal pressure with angular deflection of assembled joints between elastomeric-sealing-ring-type sockets made of plastic or metal and plastic pressure pipes.

## 2 Principle

A joint assembly as test piece consisting of a plastic pipe mounted into a socket is subjected, within a specified temperature range, to a specified internal pressure regime for a specified test period while the pipe is also subject to an angular deflection in the socket. While under pressure, the test piece is monitored for signs of leakage.

## 3 Test parameters and requirements

The test parameters of the International Standard which refers to this test International 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.

**NOTE** The following test parameters should be given by the International Standard which refers to this test International Standard.

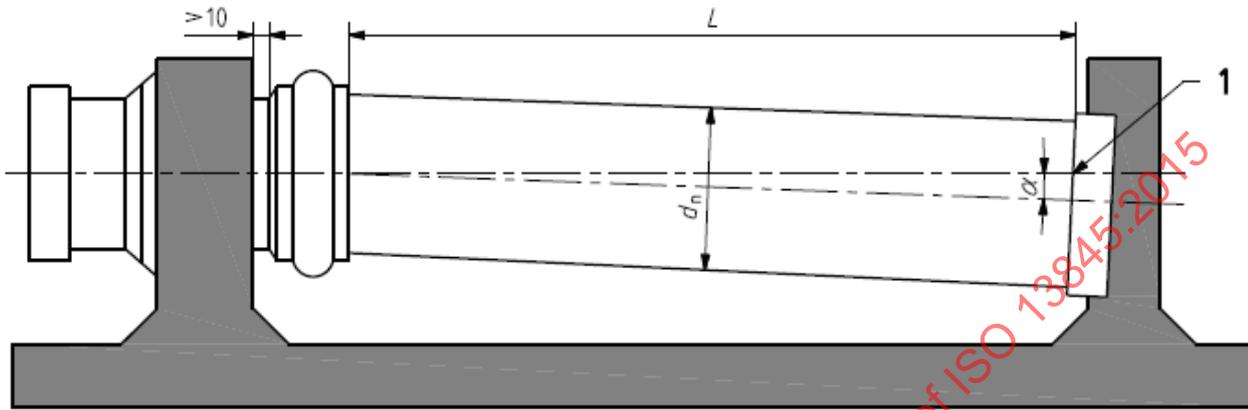
- a) test medium;
- b) test pressure [bar or MPa];
- c) test duration [h];
- d) test temperature [°C];
- e) angle of deflection ( $\alpha$ ) [°];
- f) free length [mm].

## 4 Apparatus

**4.1 Framework**, comprising at least two fixing devices, one of which is movable to allow angular deflection to be applied to the test joint. A typical arrangement is shown in [Figure 1](#).

**4.2 A pressure control device**, connected to the test piece and capable of applying and maintaining a variable internal hydrostatic pressure of up to at least twice the nominal pressure of the plastic pipe and joint assembly.

**4.3 Pressure measuring device**, capable of checking conformity to the specified static pressure values (see 6.6 and Figure A.1).



**Key**

- 1 starting point for measuring and adjusting the angle of deflection  $\alpha$
- $L$  free length of the pipe between the socket mouth and the end-seal
- $d_n$  nominal outside diameter of the pipe

**Figure 1 — Typical test arrangement**

**5 Test pieces preparation**

The test piece shall comprise an assembly of a plastic pipe section mounted into the socket to be tested.

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

The assembly shall be carried out in accordance with the socket manufacturer’s instructions.

A pipe of the same nominal pressure (PN) or the same pipe series S as that of the socket shall be used for the test.

The mean outside diameter,  $d_{em}$ , of the pipe should preferably conform to the minimum specified value, and the socket dimensions (mean inside diameter,  $d_{im}$ , and the diameter of the groove for housing the sealing ring) should preferably conform to the maximum values stated by the manufacturer, in order to have dimensions as close as possible to the extreme limits of their relevant tolerances.

**6 Procedure**

**6.1** Secure the socket, without any deformation, to the solid framework and align the pipe section with the axis of the socket.

**6.2** By inclining the pipe in the test apparatus, determine the free angle of deflection,  $\alpha_{free}$ , which the joint can tolerate without the application of force.

If the free angle of deflection is greater or equal to the required one, firmly anchor the pipe to maintain the deflected pipe in this position for the remainder of the test.

If the free angle of deflection is less than the required one, carry out the test at the required deflection measured at the starting point (see [Figure 1](#)), by forcing the pipe to that position.

**6.3** Fill the test piece with the test medium at the specified temperature. If water is used as test medium, ensure all air is removed and excluded from the test piece for the remainder of the procedure.

**6.4** Condition the test piece to ensure equalization of temperature.

Minimum conditioning times are given in [Table 1](#).

**Table 1 — Conditioning periods**

Nominal wall thickness of the pipe mm	Minimum conditioning period min
$e \leq 10$	20
$10 < e \leq 20$	60
$20 < e$	120

**6.5** While testing in accordance with [6.6](#):

- a) maintain the specified temperature within  $\pm 2$  °C;
- b) examine the joint during the whole test cycle and record any sign of leakage.

NOTE If air is used as test medium, leakage can be detected with leak detection fluid.

**6.6** Apply the specified test regime so that the specified static pressures are maintained within a permitted deviation of  ${}^{+5}_{0}$  %.

## 7 Test report

The test report shall include the following information:

- a) a reference to this International Standard (i.e. ISO 13845:2015) and 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 angle of deflection,  $\alpha$ , used for the test;
- e) the test temperature;
- f) the test duration;
- g) the test procedure;
- h) the maximum test pressure;
- i) if any sign of leakage was observed and the pressure at which this occurred;
- j) information on the leak tightness of the joint including the pressure at which a leakage occurred (if any);
- k) any factors which may have affected the results, such as any incidents or any operating details not specified in this International Standard;

l) the date of the test.

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