
Cevni sistemi iz polimernih materialov - Plastomerni fittingi, oblikovani z injekcijskim vbrizgavanjem, za tlačne cevovode - Metoda za preskus največje deformacije s stiskanjem

Plastics piping and ducting systems - Injection-moulded thermoplastics fittings for pressure piping systems - Test method for maximum deformation by crushing

Kunststoff-Rohrleitungs- und Schutzrohrsysteme - Spritzguß-Formstücke aus Thermoplasten für Druckrohrleitungen - Prüfverfahren für die Verformung durch Quetschen
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Systemes de canalisations et de gaines en plastiques - Raccords thermoplastiques moulés par injection pour canalisations avec pression - Méthode d'essai de déformation maximale par écrasement
SIST EN 802:1997
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English version

**Plastics piping and ducting systems -
Injection-moulded thermoplastics fittings for
pressure piping systems - Test method for
maximum deformation by crushing**

Systèmes de canalisations et de gaines en
plastiques - Raccords thermoplastiques moulés
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CEN

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

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

Foreword

This standard is prepared by CEN/TC 155 "Plastics piping systems and ducting systems".

This standard is based on ISO/DIS 9853:1989 "Injection-moulded unplasticized poly(vinyl chloride) (PVC-U) fittings for pressure pipe systems - Crushing test and basic specification", prepared by the International Organization for Standardization (ISO). It is a modification of ISO/DIS 9853:1989 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 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No existing European Standard is superseded by this standard.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.

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 October 1994, and conflicting national standards shall be withdrawn at the latest by October 1994.

According to the 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, United Kingdom.

Introduction

This method of test was initially developed for use with unplasticized poly(vinyl chloride) (PVC-U) fittings, which can be crushed without failure if they contain little residual stress as a result of the moulding process. However, if these stresses are too great, such fittings will break while a crushing force is applied.

The selection of a given percentage deformation of a fitting, in relation to its initial diameter, constitutes a simple criterion for selecting PVC-U fittings which have an acceptable level of internal stresses.

The method is particularly applicable to PVC-U fittings for pressure pipelines, with solvent sockets or with sockets with elastic sealing rings, but may be applicable to fittings of other materials, through reference by the relevant System Standard.

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1 Scope

This standard specifies a method for applying a crushing test to injection-moulded thermoplastics fittings intended for pressure piping systems to determine whether or not fracture will occur at a specified deformation.

2 Principle

The fitting to be tested is placed between two plates of a press and subjected at a constant speed to the necessary force to give a specified percentage deformation (see 6.5).

The fitting is monitored for fracture before or when the specified deformation has been reached and, if applicable, the type of fracture is determined.

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

- a) the speed of closure of the press plates (see 3.1 and 6.5);
- b) the minimum period, t_1 , between manufacture and testing (see 5.1);
- c) the conditioning period, t_2 (see 5.2);
- d) the percentage deformation, X , to be attained (see 6.4).

3 Apparatus

3.1 Press, capable of applying sufficient force to carry out the test, with a closing speed of the plates that can be controlled to $\pm 10\%$ of the specified closing speed.

3.2 Non-deformable supports, if applicable (see 6.2), to permit the application of the force between the seal ring housing(s) of a fitting, or to a fitting where the shape adjacent to the socket under test is complicated.

3.3 Deformation control or measurement device, capable of setting and/or measuring the amount of deformation applied to the test piece [see 6.4 and item d) of the note to clause 2].

4 Test pieces

4.1 Each test piece shall be a fitting in its condition as manufactured, i.e. without having been subjected to any subsequent process.

4.2 In the case of fittings containing sealing rings, the rings shall be removed before testing.

4.3 Unless otherwise specified in the referring standard, test at least three test pieces for each fitting pattern or feature, e.g. socket, cap, reducer, to be tested. If there are weld lines, provide three test pieces for testing in position 1 and another three others for testing in position 2 (see 6.2).

5 Conditioning

5.1 The fittings shall not be tested until at least t_1 h after their manufacture [see item b) of the note to clause 2].

5.2 Before testing, condition the test pieces at $(23 \pm 2)^\circ\text{C}$ for at least t_2 h [see item c) of the note to clause 2].

6 Procedure

6.1 Carry out the following procedure for at least three test pieces (see 4.3) using any ambient temperature in the range of 15°C to 25°C providing that for each test piece the temperature does not vary by more than $\pm 2^\circ\text{C}$.

6.2 Place the fitting flat on the centre of the lower plate of the press, in such a way that the axis of the socket(s) is (are) parallel to the plane of the plate, using, if necessary, supports conforming to 3.2.

If there is a weld line in the fitting, and if the shape of the fitting allows it, position the weld line in either position 1 or position 2, as follows, so that at least three test pieces are tested in position 1 and at least three others in position 2:

- a) position 1: weld line at 90° to the contact lines between the fitting and the plates of the press;

b) position 2: weld line in contact with the plates.

6.3 Adjust the mobile plate until both plates, or supports (see 3.2), are in contact with the fitting, without the application of force. Measure and record the distance h_0 , in millimetres, between the plates.

6.4 For a specified percentage deformation, X , calculate the limiting distance h_1 , in millimetres, between the plates, or supports, using the following equation:

$$h_1 = \frac{h_0(100 - X)}{100}$$

where:

h_0 is the distance, in millimetres, between the plates, or supports, when in contact with the test piece, without applying any force (see 6.3).

6.5 Set the closing speed of the plates at the specified speed [see item a, of the note to clause 2] and start the compression

6.6 Stop the compression when the distance between the plates, or supports, reaches h_1 mm (see 6.4), or when the test piece fractures, whichever occurs first. If the test piece has fractured, record a description of the type (i.e. brittle or ductile) and position of the fracture.

7 Test report

The test report shall include the following information:

- a) a reference to this standard and to the referring standard;
- b) the type of fitting and the material of which it is made;
- c) the nominal diameter of the fitting and any other sizes and identification;**
- d) the type of socket(s) on the fitting;
- e) the number of test pieces tested;
- f) the conditioning period, t_c , in hours and conditioning temperature, **in degrees Celsius;**
- g) whether supports were used or not;