
Cevni sistemi iz polimernih materialov - Plastomerni cevovodi, položeni v zemljo, ki delujejo po težnostnem principu - Metode za preskus tesnjenja spojev z elastomernimi tesnilnimi obroči

Plastics piping systems - Thermoplastics piping systems for buried non-pressure applications - Test methods for leaktightness of elastomeric sealing ring type joints

Kunststoff-Rohrleitungssysteme - Erdverlegte Rohrleitungssysteme aus Thermoplasten für drucklose Anwendungen - Prüfverfahren für die Dichtheit von elastomeren Dichtringverbindungen

Systemes de canalisations en plastiques - Systemes de canalisations thermoplastiques pour applications enterrées sans pression - Méthodes d'essai d'étanchéité des assemblages a bague d'étanchéité en élastomere

Ta slovenski standard je istoveten z: EN 1277:1996

ICS:

23.040.80	Tesnila za cevne zveze	Seals for pipe and hose assemblies
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SIST EN 1277:1997

en

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EUROPEAN STANDARD

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EUROPÄISCHE NORM

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ICS 23.040.90

Descriptors: buried pipes, non-pressure pipes, plastic tubes, thermoplastic resins, joining, sealing rings, rubber, leak tests, pressure tests, testing conditions

English version

Plastics piping systems - Thermoplastics piping systems for buried non-pressure applications - Test methods for leaktightness of elastomeric sealing ring type joints

Systèmes de canalisations en plastiques
 Systèmes de canalisations thermoplastiques pour applications enterrées sans pression - Méthodes d'essai d'étanchéité des assemblages à bague d'étanchéité en élastomère

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This European Standard was approved by CEN on 1996-01-27. 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.

The European Standards exist 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 Technical Committee CEN/TC 155 "Plastics piping systems and ducting systems", the secretariat of which is held by NNI.

This standard is based on the respective test methods included in

- ISO 8772:1991 "High-density polyethylene (PE-HD) pipes and fittings for buried drainage and sewerage systems - Specifications";
- ISO 8773:1991 "Polypropylene (PP) pipes and fittings for buried drainage and sewerage systems - Specifications";
- ISO 4435:1991 "Unplasticized poly(vinyl chloride) (PVC-U) pipes and fittings for buried drainage and sewerage systems - Specifications",

prepared by the International Organization for Standardization (ISO). It is a modification of ISO 8772, ISO 8773 and ISO 4435 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:

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- no material is mentioned;
 - basic test parameters are given, but they may be otherwise specified in the referring standard; <http://standards.cen.org/catalog/standards/sist/2ef06876-8174-4acc-9db2-20303309d58b/sist-en-1277-1997>
 - the principle of test condition has been introduced;
 - the external hydrostatic pressure test, alternative to the internal negative air pressure test, has been eliminated;
 - the principle of free angle has been eliminated;
 - editorial changes have been introduced.

The material-dependent 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.

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 1996, and conflicting national standards shall be withdrawn at the latest by October 1996.



According to the CEN/CENELEC Internal Regulations, the national standards organizations of 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.

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1 Scope

This standard specifies three basic test methods for determining the leaktightness of elastomeric sealing ring type joints for buried thermoplastics non-pressure piping systems. It also gives a combined test method where the three methods are executed successively.

Unless otherwise specified in the referring standard, the methods use the following pressures respectively:

- method 1: a low internal hydrostatic pressure for assessing leaktightness;
- method 2: a higher internal hydrostatic pressure for assessing performance;
- method 3: internal negative air pressure (partial vacuum);
- method 4: a combination of the methods 1, 2 and 3.

It also describes three test conditions, as follows:

- a) without any additional deformation or distortion;
- b) with diametric distortion;
- c) with angular deflection,

under which the test can be executed.

These conditions may be applied individually or in combination. The applicable selection of the method(s) and the condition(s) have to be specified in the referring standard.

2 Test methods

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

- a) the method(s);
- b) the condition(s) and their combination with each other and/or the method(s);
- c) the test pressure(s), p_1 and p_2 (see 2.1.4.4) and p_3 (see 2.2.4.3), as applicable, and the percentage of loss of partial vacuum (see 2.2.4.6).

2.1 Internal hydrostatic pressure test

2.1.1 Principle

A test piece assembled from pipes and/or fittings is subjected to a specific initial internal hydrostatic pressure, p_1 (method 1) for assessing leaktightness and, if applicable, a subsequent higher specific internal hydrostatic pressure, p_2 (method 2) for assessing performance. (see 2.1.4.4).

Each pressure is maintained for a specific period during which the joint is monitored for leakage (see 2.1.4.5).

2.1.2 Apparatus

2.1.2.1 End sealing devices, having a size and using a sealing method appropriate to seal the non-jointed ends of the test assembly. The devices shall be restrained in a manner that does not exert longitudinal forces on the joint.

2.1.2.2 Hydrostatic pressure source, connected to one of the sealing devices and capable of applying and maintaining the specified pressure (see 2.1.4.5).

2.1.2.3 Bleed valve, capable of venting air from the assembly.

2.1.2.4 Pressure measuring devices, capable of checking conformity to the specified test pressure (see 2.1.4).

NOTE: To reduce the volume of water involved, a sealed pipe or mandrel may be located within the test piece.

2.1.3 Test pieces

The test piece shall comprise an assembly of (a) pipe section(s) and/or fitting(s) including at least one elastomeric sealing ring joint.

The joints to be tested shall be assembled in accordance with the manufacturer's instructions.

2.1.4 Procedure

2.1.4.1 Carry out the following procedures at ambient temperatures using water at (19 ± 9) °C.

2.1.4.2 Mount the test piece in the apparatus.

2.1.4.3 While testing in accordance with 2.1.4.4 and 2.1.4.5, monitor the test piece for leakage. Record the details or absence of any leakage during and at the end of that testing.

2.1.4.4 Select the applicable test pressure as follows.

Method 1: The internal hydrostatic pressure shall be test pressure p_1 . Unless otherwise specified in the referring standard, p_1 shall be 0,05 bar (5 kPa) ± 10 %.

Method 2: The internal hydrostatic pressure shall be test pressure p_2 . Unless otherwise specified in the referring standard, p_2 shall be 0,5 bar (50 kPa) $+ \frac{10}{0}$ %.

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2.1.4.5 Fill the test assembly with water and bleed off the air. To ensure temperature equalization, leave it for not less than 5 min for pipes of nominal diameter, d_n , less than 400 mm and not less than 15 min for larger pipes. Raise the hydrostatic pressure gradually over a period of not less than 5 min to the specified test pressure, p_1 or p_2 , and maintain that pressure for at least 15 min or until prior failure by leakage.

2.1.4.6 After having completed the required period under pressure, depressurize and drain the test piece.

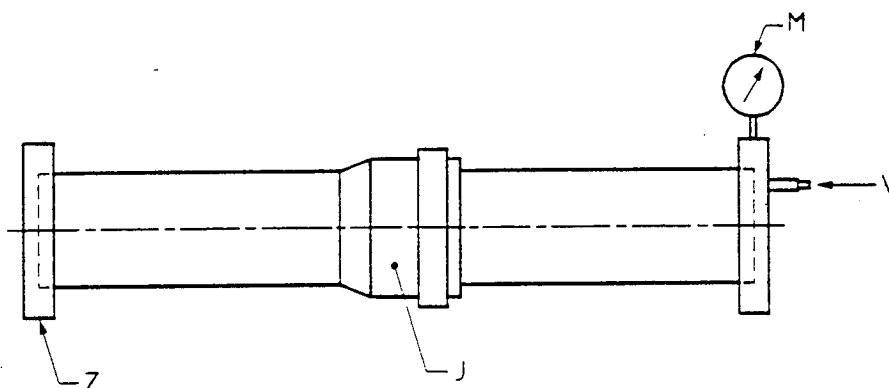
2.2 Internal negative air pressure test (partial vacuum)

2.2.1 Principle

A test piece assembled from pipes and/or fittings is subjected to a specific internal negative air pressure (partial vacuum) for a specific period of time during which the tightness of the joint is monitored by detecting changes in pressure.

2.2.2 Apparatus

The apparatus (see figure 1) shall conform at least to the apparatus specified in 2.1.2.1 and 2.1.2.4 and shall include a negative air pressure source and pressure measuring device appropriate to testing at the specified internal negative air pressure (see 2.2.4.3 and 2.2.4.6).



- M Gauge
V Negative air pressure
J joint under test
Z End seal

Figure 1: Typical apparatus for the internal negative air pressure test.
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2.2.3 Test pieces

The test piece shall comprise an assembly of (a) pipe section(s) and/or fitting(s) including at least one elastomeric sealing ring joint.

The joints to be tested shall be assembled in accordance with the manufacturer's instructions.

2.2.4 Procedure

2.2.4.1 Carry out the following procedures at ambient temperatures in the range of $(23 \pm 5) \text{ }^\circ\text{C}$ and so that when testing in accordance with 2.2.4.5 the temperature variation does not exceed $2 \text{ }^\circ\text{C}$.

2.2.4.2 Mount the test piece in the apparatus.