
Cevni sistemi iz polimernih materialov - Sestavni deli iz duromernih materialov, ojačenih s steklenimi vlakni (GRP) - Preskusne metode za preverjanje modela trdno vpetih oglavnih spojev, tesnjenih z elastomernimi tesnili

Plastics piping systems - Glass-reinforced thermosetting plastics (GRP) components - Test methods to prove the design of rigid locked socket-and-spigot joints with elastomeric seals

Kunststoff-Rohrleitungssysteme - Bauteile aus glasfaserverstärkten duroplastischen Kunststoffen (GFK) - Prüfverfahren zur Bauartprüfung von zugfesten Muffe- und Spitzende-Verbindungen mit elastomeren Dichtungen

[SIST EN 1448:1997](https://standards.iteh.ai/catalog/standards/sist/7d3caeb9-1fff-4afd-9452-11d3caeb9-1fff-4afd-9452)

Systemes de canalisations en plastique - Composants en plastique thermodurcissable renforcé de verre (PRV) - Méthodes d'essai pour confirmer la conception d'assemblages mâle-femelle verrouillés rigides a joints d'étanchéité en élastomere

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23.040.60	Prirobnice, oglavki in spojni elementi	Flanges, couplings and joints
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EUROPEAN STANDARD

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Descriptors: plastic tubes, pipe fittings, reinforced plastics, glass reinforced plastics, thermosetting resins, tests, joining, seals: stoppers, rubber, flexural strength, pressure resistance, hydrostatic pressure

English version

**Plastics piping systems - Glass-reinforced
thermosetting plastics (GRP) components - Test
methods to prove the design of rigid locked
socket-and-spigot joints with elastomeric seals**

Systemes de canalisations en plastique -
Composants en plastique thermodurcissable
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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 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 Draft International Standard ISO/DIS 7432 "Pipes and fittings of glass-fibre reinforced thermosetting plastics (GRP) - Rigid locked socket and spigot joints with elastomeric sealing rings - Performance requirements and test methods", prepared by the International Organization for Standardization (ISO). It is a modification of ISO/DIS 7432 for reasons of possible applicability to other test conditions and alignment with texts of other standards on test methods.

The modifications are as follows:

- test parameters (pressure, time, temperature) are not specified;
- performance requirements are not given;
- editorial changes have been introduced.

The material-dependent parameters and/or performance requirements are incorporated in the referring 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 May 1997, and conflicting national standards shall be withdrawn at the latest by May 1997.

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.

Introduction

In a pipework system, pipes and fittings of different nominal pressures and stiffnesses may be used.

A joint may be made between pipes and/or fittings and should be designed such that its performance is equal to or better than the requirements of the pipeline, but not necessarily of the components being joined.

The requirements for the assembly of the joint are not included in this standard, but they should be in accordance with the manufacturer's recommendations.

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1 Scope

This standard specifies methods of test for rigid locked socket-and-spigot joints using elastomeric sealing rings for plastics piping systems of glass-reinforced thermosetting plastics (GRP) for pressure and non-pressure applications. This standard is only applicable to the joint and covers methods of test to prove its design.

The tests detailed in 6.1 to 6.4 inclusive are applicable to rigid locked socket-and-spigot joints intended to be used in buried or above ground applications.

NOTE: The only purpose of testing the resistance to negative pressure is to give adequate safety against infiltration of pollutants through the joint into the fluid carried in the piping system. Under these test conditions pipes with low stiffnesses may require support to prevent them from buckling.

This test procedure is applicable to joints for pipes and fittings of all nominal sizes.

In addition the bending tests covered in 6.5 can be used to prove the design where the joints are intended to be used in buried applications where the soils are known to have very poor properties or where particular above ground applications make their use appropriate.

The tests detailed in 6.5 are applicable to joints for pipes and fittings up to and including DN 600.

All tests given in this standard are applicable for evaluating joints intended for applications conveying liquids at temperatures up to and including 50 °C and may be applicable to joints for use at higher temperatures (see clause 2).

2 Principle

A joint is subjected to specified internal pressures. The procedure includes prolonged static tests at elevated pressures and also cyclic testing.

A method is included to test the resistance of the joint to an internal negative pressure.

An additional series of tests under bending conditions is included for special applications.

At the end of each test the joint is inspected for signs of leakage and damage.

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

- a) if applicable, the bending load to be applied, i.e. F , (see 3.5, 3.6 and 6.5);
- b) the number of test pieces to be used (see 4.1);
- c) the length, L , of the assembled test piece (see 4.2);
- d) the nominal pressure relevant to the joint under test (see 4.2 and 6.2 to 6.4);
- e) if applicable, conditioning other than as given in 4.3;
- f) the test temperature and its permissible deviations (see clause 5);
- g) if applicable, any criteria indicative of damage to the joint components [see clause 6 and j) of clause 7];
- h) the acceptable increase in pressure over 1 h for negative pressure test (see 6.3).

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3 Apparatus

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3.1 End sealing devices of size and type appropriate to the joint system under test. The end-sealing devices shall be anchored to the pipes when end thrust loads are to be applied (see 6.2 to 6.4), and shall permit free axial movement of the test pipes when end thrust loads are not to be applied (see 6.5).

3.2 A source of hydrostatic pressure to meet the needs of the test (see clause 6).

3.3 A means to measure the gauge pressure at the top of the pipe and check conformity to the specified pressures (see clause 6).

3.4 Vacuum pump or equivalent, capable of applying the required negative gauge pressure (see 6.3).

3.5 Strap or cradle, extending up to a 180° arc of the pipe barrel or the joint, fixed at the appropriate position to apply a bending load (see 3.6).

3.6 Means of applying and measuring the required bending load (F , see 6.5.4) to an accuracy within $\pm 5\%$, if applicable.

4 Test pieces

4.1 Number

The number of test pieces shall be as specified in the referring standard.

4.2 Arrangement

The test piece shall be an assembly of one or two pieces of pipe, as applicable, of the correct size and nominal pressure, as specified in the referring standard, in between which the joint to be tested is located.

The length, L , of the assembly shall be not less than that specified in the referring standard and shall allow, if required (see 6.5), the joint under test to be located in the middle of the test arrangement.

The joint shall be assembled in accordance with the manufacturer's recommendations and, if applicable, the requirements of the referring standard.

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WARNING: Bolts which are normally supplied for use at a certain PN rating can reasonably be used in tests at $2 \times [\text{PN}]$, but it would be dangerous to use them at $4 \times [\text{PN}]$. Therefore when performing the test described in 6.4 it is recommended that the capacity of the bolts be checked and, if necessary, suitable higher capacity bolts should be used.

4.3 Conditioning

Unless otherwise specified in the referring standard, condition the test pieces at the test temperature (see clause 5) for at least 24 h prior to testing.

5 Test temperature

Conduct the following procedure at the temperature specified in the referring standard.

6 Procedure

6.1 Sequence for pressure testing

Subject each test piece (see 4.2) to those of the following tests specified in the referring standard, in the sequence as given in table 1 and 6.2 to 6.4.

NOTE: Each reference to hydrostatic pressure specifies an internal gauge pressure (i.e. relative to atmospheric pressure) and the nominal pressure is that relevant to the joint under test.

If a test is interrupted, record the details in the test report and repeat the particular test before carrying on to the next in the series of tests, if applicable. Failure of the end caps shall not constitute failure of the joint. If the test conditions are invalidated thereby, repeat the particular test after replacing the failed component.

Table 1: Summary of test conditions for pressure testing

Test	Tests and sequence	Minimum test pressure	Minimum duration
Initial leakage	Initial pressure	$1,5 \times [\text{PN}]$	15 min
Resistance to internal pressure with hydrostatic end thrust	Preliminary hydrostatic pressure	$1,5 \times [\text{PN}]$	15 min
	Maintained hydrostatic pressure	$2 \times [\text{PN}]$	24 h
	Positive cyclic pressure	Atmospheric to $1,5 \times [\text{PN}]$ to atmospheric	10 cycles of 1,5 min to 3 min each
External ¹⁾ pressure differential	Negative pressure ²⁾	$-0,8 \text{ bar}^{\text{3)}$ ($-0,08 \text{ MPa}$)	1 h
Short duration pressure resistance with hydrostatic end thrust	Preliminary hydrostatic pressure	$1,5 \times [\text{PN}]$	15 min
	Maintained hydrostatic pressure	$4 \times [\text{PN}]$	6 min
<p>1) This test can be performed at any point in the sequence detailed.</p> <p>2) Relative to atmospheric pressure, i.e. approximately 0,2 bar (0,02 MPa) absolute.</p> <p>3) If the referring standard requires a different negative pressure, then that shall be used.</p>			