
Cevni sistemi iz plastomernih materialov - Natezno trdni mehanski spoji med tlačnimi cevmi in fittingi - Metoda za preskus odpornosti na izvlečenje s konstantno osno obremenitvijo

Thermoplastics piping systems - End-load bearing mechanical joints between pressure pipes and fittings - Test method for resistance to pull-out under constant longitudinal force

Thermoplastische Rohrleitungssysteme - Zugfeste mechanische Verbindungen zwischen Druckrohren und Formstücken - Prüfverfahren für den Widerstand gegen Herausziehen unter konstanter Belastung

Systemes de canalisations thermoplastiques - Assemblages mécaniques avec effet des fonds entre tubes avec pression et raccords - Méthode d'essai de résistance a l'arrachement sous force constante

Ta slovenski standard je istoveten z: EN 712:1993

ICS:

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

SIST EN 712:1997

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EUROPEAN STANDARD

EN 712

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 1993

ICS 23.040.60

Descriptors: Pipelines, pipes, pressure pipes, plastic pipes, pipe fitting, joint, pull-out, tensile strength, tests

English version

**Thermoplastics piping systems - End-load bearing
mechanical joints between pressure pipes and
fittings - Test method for resistance to pull-out
under constant longitudinal force**

Systèmes de canalisations thermoplastiques -
Assemblages mécaniques avec effet de fond entre
tubes avec pression et raccords - Méthode
d'essai de résistance à l'arrachement sous
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This European Standard was approved by CEN on 1993-11-25. 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.

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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, Czech Republic, 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 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 international standard ISO 3501:1976 "Assembled joints between fittings and polyethylene (PE) pressure pipes - Test of resistance to pull out", published by the International Organization for Standardization (ISO). It is a modification of ISO 3501:1976 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 specific material is mentioned;
- no diameter limit is given;
- no material-dependent requirements are given;
- editorial changes have been introduced.

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

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According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies a method for checking the ability of assembled end-load bearing mechanical joints (excluding fusion-welded joints) between fittings and pressure pipes to withstand a longitudinal tensile force.

2 Principle

An assembled joint is subjected to a longitudinal tensile force calculated as a function of the pipe dimensions and the maximum permissible induced hoop stress of the relevant pipe.

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

- a) the maximum permissible induced hoop stress σ_c (see 5.2) or, if applicable, the relevant basis for establishing the pull-out force F (see 5.1);
- b) the test temperature T (see 5.2), in degrees Celsius;
- c) the maximum diameter to which the test method is applicable and requirements set.

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3 Apparatus

3.1 **Tensometer**, capable of holding the test piece at a constant longitudinal stress or a device by which the calculated force (see clause 5) may be applied to the test piece by means of weights (see figure 1). In the second case the test piece shall be suspended on a frame with a suitable stirrup at the lower end of the test piece to hold the weights.

4 Test piece

The test piece shall consist of the fitting to be tested assembled with one or more pieces of pipe of the size and type for which the fitting is designed.

Each piece of pipe shall be at least 200 mm in length.

The assembly of the joint shall be carried out in accordance with the manufacturer's instructions.

Pipes and fittings to be assembled shall be at least 24 h old.

NOTE: Certain materials, e.g. polybutylene, may require longer periods before test.

5 Procedure

5.1 Unless the pull-out force F , or its derivation are otherwise specified by the referring standard, from the dimensions of the pipe, calculate the area of the cross section of the pipe wall, and from this figure calculate the force, F , in newtons, necessary to produce a longitudinal stress of one and a half times the maximum permissible induced hoop stress, σ_t , for the material from which the pipe is made, using the following equation:

$$F = 1,5 \pi e_m \sigma_t (d_n - e_m)$$

where:

σ_t is the maximum permissible induced stress, in megapascals, for the relevant pipe, as specified in 5.2;

d_n is the nominal outside diameter of the pipe, expressed in millimetres;

e_m is the mean wall thickness calculated from six values comprising four positions equally spaced around the circumference of the pipe plus the maximum and the minimum wall thickness.

Secure the test piece in the apparatus.

Apply the calculated force, F , gradually over a period of 30 s.

Hold the test piece in constant tension and at the specified temperature for a period of at least 1 h.

Inspect the joint(s) for and record any indications of loosening of the joint or partial or complete separation from the fitting by pull-out.

5.2 Unless otherwise specified in the referring standard, σ_t shall be the maximum permissible induced hoop stress when subjected to water under pressure at $(20 \pm 2) ^\circ\text{C}$ for 50 years.

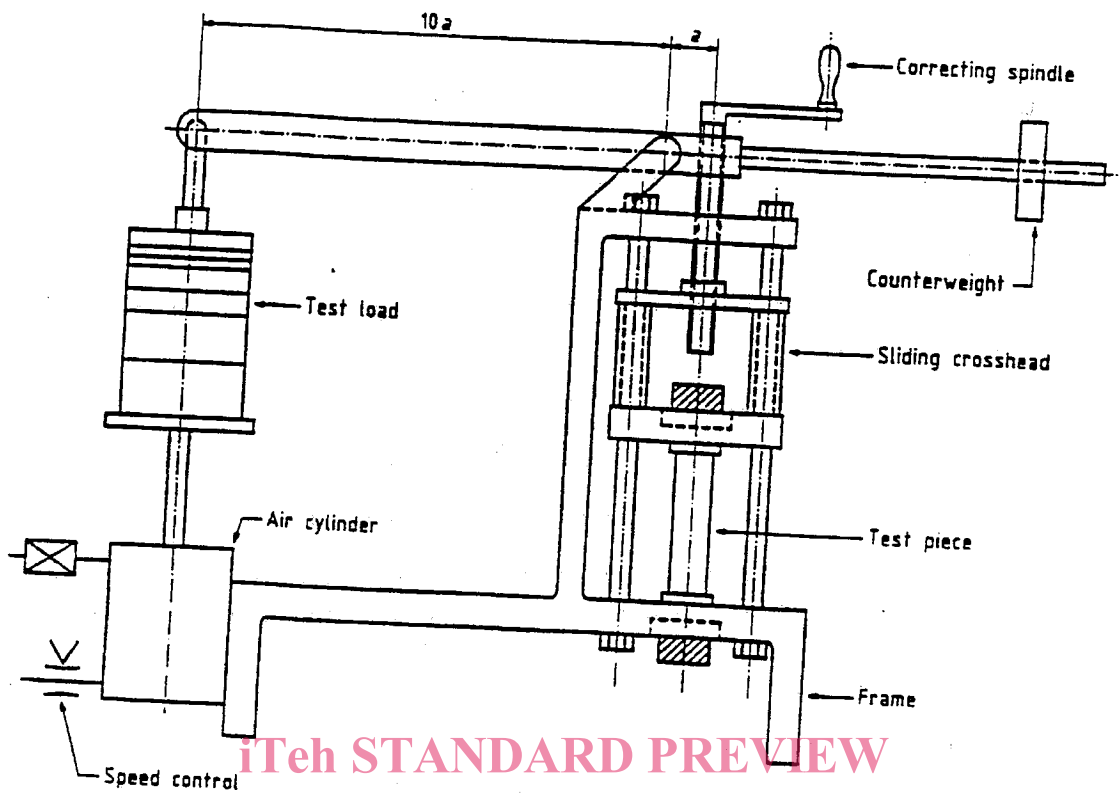
6 Test report

The test report shall include the following information:

- a) a reference to this standard and to the relevant referring standard;
- b) the identity of the components (fitting, pipe(s)) comprising the joint under test;
- c) the calculated force F in newtons;
- d) the test temperature T in degrees Celsius;
- e) the maximum permissible induced hoop stress, σ_c ;
- f) a report of separation of the pipe from the fitting by pull-out, if this occurred, or otherwise a declaration that the joint was not pulled out, together with a report of any signs of loosening of or leakage from the joint, if applicable;
- g) any factors which may have affected the results, such as any incidents or any operating details not specified in this standard;
- h) the date of test.

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Figure 1: Diagram of typical apparatus