SLOVENSKI STANDARD

SIST EN ISO 13478:1999

01-julij-1999

Plastomerne cevi za transport fluidov - Ugotavljanje odpornosti proti hitremu širjenju razpoke (RCP) - Preskus polnega obsega (Full-scale test - FST) (ISO 13478:1997

Thermoplastics pipes for the conveyance of fluids - Determination of resistance to rapid crack propagation (RCP) - Full-scale test (FST) (ISO 13478:1997)

Rohre aus Thermoplasten für den Transport von Fluiden - Bestimmung des Widerstandes gegenüber schneller Rißfortpflanzung - Praxistest (FST) (ISO 13478:1997)

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Tubes en matieres thermoplastiques pour le transport des fluides - Détermination de la résistance a la propagation rapide de la fissure (RCP) - Essai grandeur nature (FST) (ISO 13478:1997)

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Ta slovenski standard je istoveten z: **EN ISO 13478:1997**

ICS:

23.040.20 Cevi iz polimernih materialov Plastics pipes

SIST EN ISO 13478:1999 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 13478

May 1997

ICS 23.040.20

Descriptors: see ISO document

English version

Thermoplastics pipes for the conveyance of fluids - Determination of resistance to rapid crack propagation (RCP) - Full-scale test (FST) (ISO 13478:1997)

Tubes en matières thermoplastiques pour le transport des fluides - Détermination de la résistance à la propagation rapide de la fissure (RCP) - Essai grandeur nature (FST) (ISO 13478:1997)

Rohre aus Thermoplasten für den Transport von Fluiden - Bestimmung des Widerstandes gegenüber schneller Rißfortpflanzung - Praxistest (FST) (ISO 13478:1997)

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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

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Foreword

The text of the International Standard ISO 13478:1997 has been prepared by Technical Committee ISO/TC 138 "Plastics pipes, fittings and valves for the transport of fluids" in collaboration with Technical Committee CEN/TC 155 "Plastics piping systems and ducting systems", the secretariat of which is held by NNI.

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 November 1997, and conflicting national standards shall be withdrawn at the latest by November 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 13478:1997 was approved by CEN as a European Standard without any modification.

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INTERNATIONAL STANDARD

ISO 13478

First edition
1997-05-01

Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack propagation (RCP) — Full-scale test (FST)

Tubes en matières thermoplastiques pour le transport des fluides — Détermination de la résistance à la propagation rapide de la fissure (RCP) — Essai grandeur nature (FST)

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Reference number
ISO 13478:1997(E)

Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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International Standard ISO 13478 was prepared by Technical Committee 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*.

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Annexes A and B form an integral part of this International Standard.

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Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack propagation (RCP) — Full-scale test (FST)

1 Scope

This International Standard specifies a full-scale method of test for determination of arrest or propagation of a crack initiated in a thermoplastics pipe at a specified temperature and internal pressure.

It is applicable to the assessment of the performance of thermoplastics pipes intended for the supply of gases or liquids, in the latter case when air may also be present in the pipe.

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2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

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ISO 1167:1996, *Thermoplastics pipes for the conveyance of fluids — Resistance to internal pressure — Test method.*

ISO 3126:1974, *Plastics pipes — Measurement of dimensions.*

ISO 11922-1:1997, *Thermoplastics pipes for the conveyance of fluids — Dimensions and tolerances — Part 1: Metric series.*

3 Definitions

For the purposes of this International Standard, the definitions given in ISO 11922-1 apply.

4 Principle

A thermoplastics pipe, maintained at a specified temperature and containing a fluid at a specified test pressure, is subjected to an impact designed to initiate a crack.

The test temperature and test pressure are as defined in the referring standard.

The fluid is identical to that used in the intended application, or is a substitute fluid which gives equivalent results.

The test simulates the performance of a buried pipe in service under conditions which do not retard the rate of decompression of the pressurizing fluid through any fracture.

The pipe is subsequently examined to determine whether arrest or propagation of the crack has occurred.

From a series of such tests at different pressures but at constant temperature, a critical pressure or critical stress for crack propagation can be determined (see annex A for further information).

Similarly, by testing at a series of temperatures whilst maintaining a constant pressure or hoop stress, the critical temperature for crack propagation can be determined (see annex B for further information).

5 Test parameters

It is assumed that the following parameters will be set by the referring product standard:

a) the diameter(s) and series of the pipe(s) to be tested;

b) the pressurizing fluid (6.4), e.g. gas, water, water plus air;

c) the test pressure(s);

d) the test temperature(s).

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6 Materials

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6.1 Methylated spirits, for use as a cooling fluid (see 7.4.3).

6.2 Solid carbon dioxide, for use as a cooling agent (see 7.4.3).

6.3 Washed gravel, with a size range of 20 mm to 40 mm diameter (see clause 9).

6.4 Pressurizing fluid, which shall be as specified in the referring standard.

NOTES

1 It is satisfactory to use nitrogen or air as the pressurizing fluid instead of natural gas, as the measured pressure for rapid crack propagation (RCP) will be only slightly less than that obtained with natural gas. The decompression speed (velocity of sound) at 0 °C of nitrogen and air is 337 m/s and 334 m/s, respectively, compared with approximately 430 m/s for natural gas.

2 In water-pipeline systems which contain water only, the phenomenon of crack propagation is unlikely to occur. However, when entrained air bubbles or air pockets are present it is possible. It is usual to test with between 5 % and 10 % by volume of air in the water to determine the resistance to crack propagation. A test on water pipe using 100 % gas or air should be expected to give a pessimistic result.

7 Apparatus

7.1 Temperature-controlled trough, capable of accommodating the minimum test-pipe length of 14 m. The trough shall have means for maintaining the temperature specified by the referring standard to within ± 1,5 °C along the whole test-pipe length by means of a water-recirculation system around the test pipe (see figure 1). If necessary, the water shall contain an antifreeze to avoid ice build-up round the test pipe.

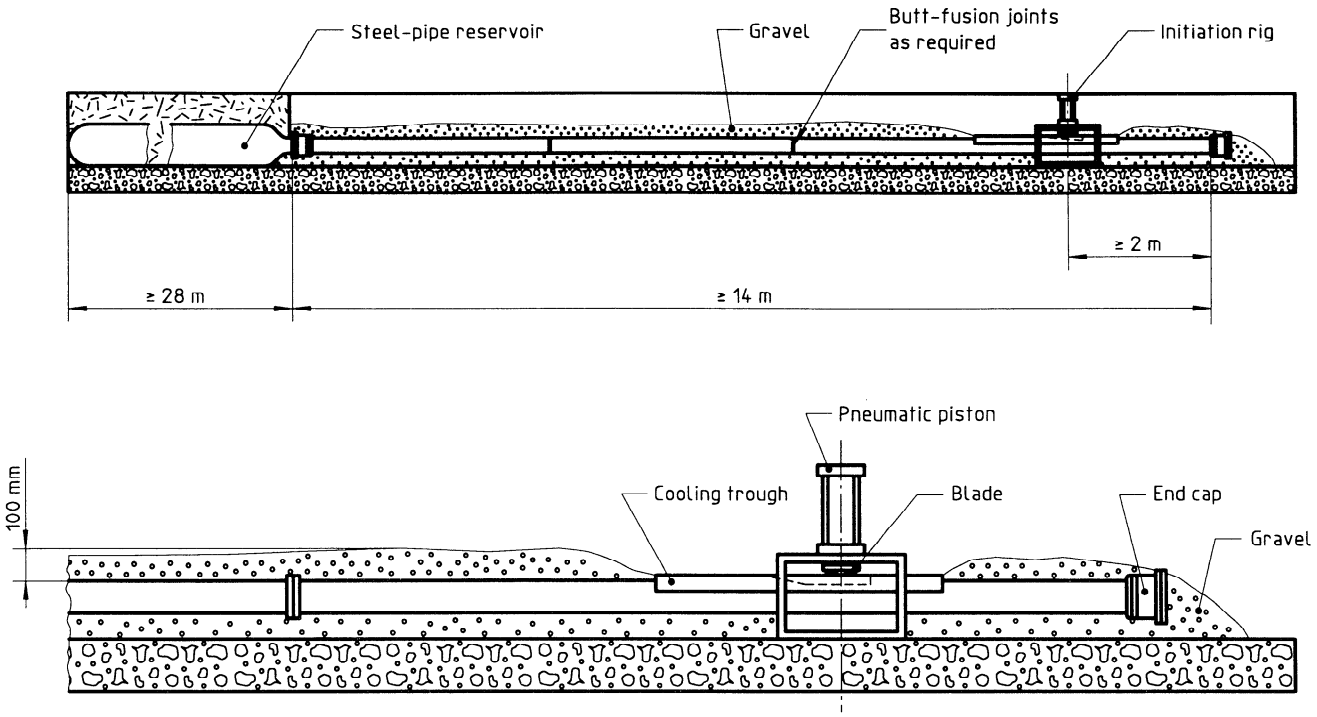

Figure 1 — Example of a test facility for full-scale rapid crack propagation

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7.2 Steel-pipe reservoir, connected to the test pipe at one end of the trough. The steel pipe shall have a bore diameter equal to or greater than the test-pipe bore diameter. The pipe reservoir shall have a minimum length of twice that of the test pipe and a minimum volume of three times that of the test pipe.

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7.3 Pressurization equipment, for pressurizing the test pipe and steel reservoir (7.2) with the test fluid (6.4) to within ± 2 % of the test pressure specified by the referring standard.

7.4 Crack-initiation equipment.

7.4.1 Router, capable of machining a longitudinal groove to an appropriate depth in the test-pipe wall for approximately 500 mm and then gradually decreasing the groove depth to zero over approximately 250 mm (see figure 2).

7.4.2 Metal blade, which can be aligned with the external groove in the test pipe and be driven through the residual pipe-wall thickness.

NOTE — A 400-mm-long steel blade driven by a fast-acting pneumatic piston has been found to be suitable for polyethylene pipe (see figure 3).

Dimensions in millimetres

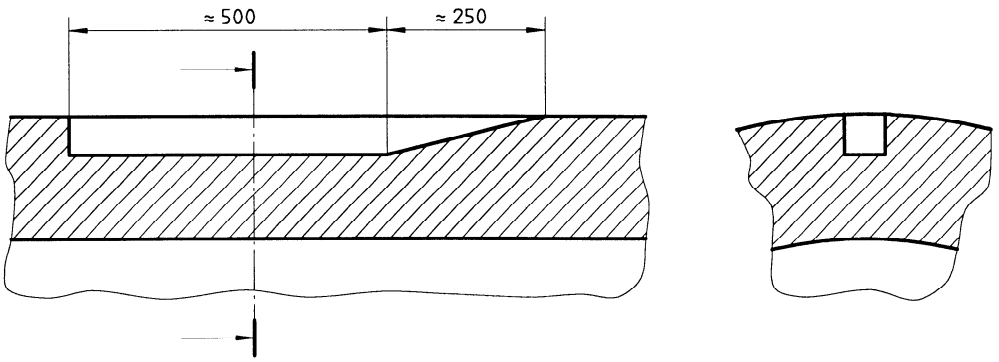

Figure 2 — Groove machined in external pipe wall