SLOVENSKI STANDARD
SIST EN 448:2000

01-december-2000

Preinsulated bonded pipe systems for underground hot water networks - Fitting assemblies of steel service pipes, polyurethane thermal insulation and outer casing of polyethylene

Preinsulated bonded pipe systems for underground hot water networks - Fitting assemblies of steel service pipes, polyurethane thermal insulation and outer casing of polyethylene

Werksmäßig gedämmte Verbundmantelrohrsysteme für erdverlegte Fernwärmenetze - Verbund-Formstücke bestehend aus Stahl-Mediumrohr, Polyurethan-Wärmedämmung und Außenmantel aus Polyethylen

Systemes bloqués de tuyaux préisolés pour les réseaux enterrés d'eau chaude - Raccords préisolés, tubes de service en acier, isolation thermique en polyuréthane et tube de protection en polyéthylene

Ta slovenski standard je istoveten z: **EN 448:1994**

ICS:

23.040.10	Železne in jeklene cevi	Iron and steel pipes
23.040.10	Železne in jeklene cevi	Iron and steel pipes
91.140.65	Oprema za ogrevanje vode	Water heating equipment

SIST EN 448:2000 **en**

EUROPEAN STANDARD **EN 488**

NORME EUROPÉENNE

EUROPÄISCHE NORM October 1994

ICS 23.040.90; 23.060.00; 91.140.10

Descriptors: Water pipelines, buried pipes, hot water, cocks, steels, thermal insulation, polyurethane, polyethylene, specifications, tests, leaktightness, marking

English version

Preinsulated bonded pipe systems for underground hot water networks - Steelvalve assembly for steel service pipes, polyurethane thermal insulation and outer casing of polyethylene

Systèmes bloqués de tuyaux préisolés pour les réseaux enterrés d'eau chaude - Robinets préisolés en acier, isolation thermique en polyuréthane et tube de protection en polyéthylène

Werksmäßig gedämmte Verbundmantelrohrsysteme für erdverlegte Fernwärmenetze - Vorgedämmte Absperrarmaturen für Stahlmediumrohre mit Polyurethan-Wärmedämmung und Außenmantel aus Polyethylen

This European Standard was approved by CEN on 1994-10-14. 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

Contents

Foreword

This European Standard was drawn up by CEN/TC 107/WG5 "Fittings" under the Technical Committee CEN/TC 107 "Prefabricated district heating pipe systems", the secretariat of which is held by the Danish Standards Association.

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 April 1995, and conflicting national standards shall be withdrawn at the latest by April 1995.

This specification is part of the series standards for bonded systems using polyurethane foam thermal insulation, applied by injection (pouring), to bond a steel valve and a polyethylene casing pipe.

The other standards from TC 107 are:

EN 253:1994 - Pipes
EN 448:1994 - Fittings
EN 489:1994 - Joints

In accordance with the Common CEN/CENELEC Rules 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 United Kingdom.

1 Scope

This European Standard covers valve assemblies for underground hot water networks with preinsulated pipe assemblies in accordance with EN 253.

This standard specifies requirements and test methods for prefabricated thermally insulated valve assemblies, comprising a steel valve, rigid polyurethane foam insulation and outer casing of polyethylene.

This standard applies only to injected (poured) insulated valve assemblies for continuous operation with hot water at various temperatures in accordance with clause 1 of EN 253:1993.

The estimation of expected life with continuous operation at various temperatures is outlined in annex B of EN 253:1993.

Guidelines for quality inspection are given in annex A to this standard.

Guidelines for installation of values are given in annex B to this standard.

Note: For this application the following valve types are commonly used: Ball valves, gate valves, and butterfly valves.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 253:1993, Peinsulated bonded pipe systems for underground hot water networks. Pipe assembly of steel service pipes, polyurethane thermal insulation and outer casing of high density polyethylene

EN 448:1993, Preinsulated bonded pipe systems for underground hot water networks. Fitting assemblies of steel service pipes, polyurethane thermal insulation and outer casing of high density polyethylene

ISO 5208:1982, Industrial valves - Pressure testing of valves

ISO 5752:1982, Metal valves for use in flanged pipe systems. Face-to-face and centre-to-face dimensioning.

3 Definitions

For the purpose of this standard, the definitions given in EN 253 and EN 448 apply.

For valve type terminology see clause 4 of ISO 5752:1982.

4 Requirements

4.1 Steel parts

4.1.1 General requirements for the valves

The valve body shall be fully welded. Flanged or screwed connections are not allowed.

The design of the valve shall make it possible to operate the valve outside the insulation.

The valve shall close when turned clockwise and open when turned anti-clockwise.

The stem construction shall make it possible to manoeuvre the valve by means of a T-key from ground level. Commonly used keyways are 19, 27, 36, 50 and 60 mm, or conical quadrangle 27/32 mm.

Butterfly valves with nominal diameter DN 100 and larger, ball valves and plug valves with nominal diameter DN 200 and larger shall be provided with a gear or a connection for an actuator to ensure controlled manoeuvring of the valve. Commonly used keyways for connections for actuators are 60, 70 and 90 mm.

Ball valves, butterfly valves and plug valves shall be provided with a stop device that can be replaced without removing the insulation.

The sealing around the stem shall be capable of being serviced without removing the insulation.

Ball valves, butterfly valves and plug valves shall be marked permanently with closed and open positions. The marking shall be legible on the valve assembly.

4.1.2 Pressure ratings for the valves

The valves shall be designed for use in pipe systems of PN 16 or PN 25.

The valves shall be able to withstand a test pressure of 1,5 times PN in open and closed position.

The valves shall be marked with the pressure rating, PN.

The marking shall be legible on the valve assembly.

4.1.3 Service temperatures for valves

The valves shall be able to withstand continuous operation with hot water at various temperatures in accordance with clause 1 of EN 253:1993 and at a minimum water temperature of 10 °C.

4.1.4 Steel service pipes

Steel pipes to be welded to the valves shall be in accordance with 4.1 of EN 253:1993.

4.1.5 Welding ends on valves

The diameter shall be in accordance with 4.1.2 of EN 253:1993.

The wall thickness shall be in accordance with 4.1.3 of EN 253:1993.

The quality of the steel shall make it weldable to steel service pipes in accordance with 4.1.4 of this standard.

If the valve is painted, the welding ends shall be free from paint for at least 100 mm.

4.1.6 Resistance to bending and axial forces

The valves shall be able to withstand conditions in pre-stressed systems, with a maximum axial tensile stress of 163 N/mm² and an axial compressive stress of 144 N/mm².

This axial stress arises in the part of the system that is
fixed by friction, when the system is cooled by 70 K or heated by 60 K from the temperature where the system is without axial stress.

The corresponding axial tensile and compressive forces are shown in table 1.

For further information, see Annex B.

Table 1

Nominal diameter DN	Outside diameter of the service pipe mm	Wall thickness of the service pipe mm	Tensile force kN	Compressive force kN
20	26.9	2.0	26	23
25	33.7	2.3	37	33
32	42.4	2.6	53	47
40	48.3	2.6	61	54
50	60.3	2.9	85	75
65	76.1	2.9	109	96
80	88.9	3.2	140	124
100	114.3	3.6	204	180
125	139.7	3.6	251	222
150	168.3	4.0	337	297
200	219.1	4.5	495	437
250	273.0	5.0	686	606
300	323.9	5.6	913	806
350	355.6	5.6	1004	887
400	406.4	6.3	1291	1140
450	457.0	6.3	1454	1285
500	508.0	6.3	1619	1430
600	610.0	7.1	2192	1936

The resistance to axial forces of valve constructions shall be tested in accordance with 5.2.1.

The test shall show the ability of the valve construction to function at:

- Axial tensile and compressive forces within the maximum values shown in table 1.
- Medium temperatures up to 140°C.
- Internal pressure up to the nominal pressure for the valve.

The shell and stem casing shall remain tight during the test.

The tightness of the seat during the test shall conform to leakage rate 2 or 3 in accordance with table 4 of ISO 5208:1982.

When manoeuvring the valve during the test, the torque shall be within the limits given by the valve manufacturer.

The test results shall be recorded.

Note: The test can be made on one mean size for a series of valve sizes having the same construction principle and design.

4.1.7 Tightness of the valves

The valve manufacturer shall perform tightness tests with every valve.

4.1.7.1 Tightness of the shell and stem casing

When tested in accordance with 5.2.2.1, the shell and stem casing shall be tight.

4.1.7.2 Tightness of the seat

When tested in accordance with 5.2.2.2, the maximum seat leakage shall conform to leakage rate 2 or 3 in accordance with table 4 of ISO 5208:1982.

4.2 Fusion welding of steel

Fusion welding between steel valves and steel service pipes shall be carried out in accordance with 4.1.7 of EN 448:1993.

4.3 Casing pipe

The casing pipe shall be in accordance with 4.2 of EN 448:1993.

4.4 Polyurethane rigid foam insulation (PUR)

The polyurethane rigid foam insulation (PUR) shall be in accordance with 4.3 of EN 448:1993.

4.5 Valve assembly

4.5.1 Ends of valve assembly

Ends of the steel valve and of the casing shall be in accordance with 4.4.1 of EN 448:1993.

4.5.2 End of stem construction

Where the stem construction passes through the casing, there shall be an arrangement to protect against water ingress to the insulation.

The stem construction outside the insulation shall be made of corrosion resistent material.

4.5.3 General requirements for polyethylene welding

The general requirements for polyethylene welding shall be in accordance with 4.4.3 of EN 448:1993.

4.5.4 Tightness of the welded casing pipe after foaming

The tightness of the welding in the casing pipe after foaming shall be in accordance with 4.4.4 of EN 448:1993.

4.5.5 Increase in diameter of the casing pipe

The increase in diameter of the casing pipe shall be in accordance with 4.4.5 of EN 448:1993.

4.5.6 Minimum insulation thickness

The minimum insulation thickness shall be in accordance with 4.4.6 of EN 448:1993.

4.5.7 Tolerances on the main dimensions

The tolerance on the declared total length between ends of the valve assembly shall be ±10 mm.

The tolerance on the declared height of the stem from the centre line of the steel pipe in the valve assembly shall be ± 5 mm.

5 Test methods

Where test requirements specified in this standard differ from those in other standards referred to, the requirements laid down in this standard shall apply.

5.1 Test specimens

Test specimens from casing pipes and polyurethane foam shall be taken in accordance with 5.1 of EN 448:1993.

5.2 Steel parts

5.2.1 Constructional testing of valves

The tests shall be carried out in the following order and on the same valve for the whole test.

5.2.1.1 Tightness of shell and stem casing of the unloaded valve

The tightness test of the shell and stem casing shall be carried out in accordance with 4.2 of ISO 5208:1982.