



SLOVENSKI STANDARD

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Nadomešča:

SIST EN 488:2011+A1:2014

Cevi za daljinsko ogrevanje - Izolirani vezani cevni sistemi za podzemeljska toplovodna omrežja - Sestav jeklenih ventilov za jeklene cevi, poliuretansko toplotno izolacijo in zunanji polietilenski plašč

District heating pipes - Preinsulated bonded pipe systems for directly buried hot water networks - Steel valve assembly for steel service pipes, polyurethane thermal insulation and outer casing of polyethylene

Fernwärmerohre - Werkmäßig gedämmte Verbundmantelrohrsysteme für direkt erdverlegte Fernwärmenetze - Vorgehängte Absperrarmaturen für Stahlmediumrohre mit Polyurethan-Wärmedämmung und Außenmantel aus Polyethylen

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

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EUROPEAN STANDARD

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This European Standard was approved by CEN on 5 September 2015.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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EN 488:2015 (E)**European foreword**

This document (EN 488:2015) has been prepared by Technical Committee CEN/TC 107 “Prefabricated district heating and district cooling pipe systems”, the secretariat of which is held by DS.

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of an identical text or by endorsement, at the latest by May 2016, and conflicting national standards shall be withdrawn at the latest by May 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 488:2011+A1:2014.

In comparison with the previous edition, the main changes in EN 488:2015 are:

- improvement and simplification of the type test of the steel valve. The cycle test has been integrated in the test sequence;
- the formulae in Annex C for the calculation of bending forces have been improved. C.1.3 of EN 488:2011+A1:2014 concerning alternative test application for diameters $DN \leq 200$ mm, has been deleted.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

EN 488 has also been aligned with EN 448 and other relevant European Standards.

Other standards from CEN/TC 107 are:

- EN 253, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene*;
- EN 448, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Fitting assemblies of steel service pipes, polyurethane thermal insulation and outer casing of polyethylene*;
- EN 489, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Joint assembly for steel service pipes, polyurethane thermal insulation and outer casing of polyethylene*;
- EN 13941, *Design and installation of preinsulated bonded pipe systems for district heating*;
- EN 14419, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Surveillance systems*;
- EN 15632 (all parts), *District heating pipes — Pre-insulated flexible pipe systems*;
- EN 15698-1, *District heating pipes — Preinsulated bonded twin pipe systems for directly buried hot water networks — Part 1: Twin pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene*; [SIST EN 488:2016](https://standards.iteh.ai/catalog/standards/sist/83afaca8-deb4-4fdf-99d4-049345400d6/sist-en-488-2016)
- EN 15698-2, *District heating pipes — Preinsulated bonded twin pipe systems for directly buried hot water networks — Part 2: Fitting and valve assembly of steel service pipes, polyurethane thermal insulation and outer casing of polyethylene*. <https://standards.iteh.ai/catalog/standards/sist/83afaca8-deb4-4fdf-99d4-049345400d6/sist-en-488-2016>

EN 488:2015 (E)**1 Scope**

This European Standard specifies requirements and test methods for valves of prefabricated thermally insulated valve assemblies comprising a steel valve, rigid polyurethane foam insulation and an outer casing of polyethylene for use in directly buried hot water networks with pre-insulated pipe assemblies in accordance with EN 253.

This European Standard applies only to factory made prefabricated insulated valve assemblies for continuous operation with hot water at various temperatures in accordance with EN 253:2009+A2:2015, Clause 1 and the valve assemblies with a maximum operation pressure of 25 bar. For higher pressures, additional demands apply.

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

This European Standard does not include calculation rules for loads and stresses. These depend on the configuration of the system as it is installed. The design and installation rules are given in EN 13941.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 19, *Industrial valves — Marking of metallic valves*

EN 253:2009+A2:2015, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene*

EN 448:2015, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Fitting assemblies of steel service pipes, polyurethane thermal insulation and outer casing of polyethylene*

EN 736-1, *Valves - Terminology — Part 1: Definition of types of valves*

EN 10088-1:2014, *Stainless steels — Part 1: List of stainless steels*

EN 10204, *Metallic products — Types of inspection documents*

EN 12266-1, *Industrial valves — Testing of metallic valves — Part 1: Pressure tests, test procedures and acceptance criteria — Mandatory requirements*

EN 12502-4, *Protection of metallic materials against corrosion — Guidance on the assessment of corrosion likelihood in water distribution and storage systems — Part 4: Influencing factors for stainless steels*

EN 13941:2009+A1:2010, *Design and installation of preinsulated bonded pipe systems for district heating*

EN 14419, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Surveillance systems*

EN ISO 12944-2, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 2: Classification of environments (ISO 12944-2)*

EN ISO 12944-5, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 5: Protective paint systems (ISO 12944-5)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 253:2009+A2:2015 and EN 448 and the following apply. For types of valves, the terms and definitions given in EN 736-1 apply.

3.1

nominal pressure (PN) class

alphanumeric designation used for reference purposes related to a combination of mechanical and dimensional characteristics of a component of a pipe work system

Note 1 to entry: It comprises the letters PN followed by a dimensionless number.

Note 2 to entry: The number following the letters PN does not represent a measurable value and should not be used for calculation purposes except where specified in the relevant standard.

Note 3 to entry: The designation PN is not meaningful unless it is related to the relevant component standard number.

Note 4 to entry: The maximum allowable pressure of a pipework component depends on the PN number, the material and design of the component, its maximum allowable temperature, etc. The relevant European Component standards include tables of specified pressure/temperature ratings or, in minimum, include rules how to determine pressure/temperature ratings.

Note 5 to entry: It is intended that all components with the same PN and DN designations have the same mating dimensions for compatible flange types.

[SOURCE: EN 1333:2006, 2.1, modified – added Note 1 to entry.]

3.2

maximum operation pressure

maximum internal pressure acting against the pipe wall at any point or in any section of the pipeline at a given operating temperature

[SOURCE: EN 13941:2009+A1:2010, 3.1.19, modified]

3.3

nominal size

DN

alphanumeric designation of size, common to components in piping systems which are used for reference purposes

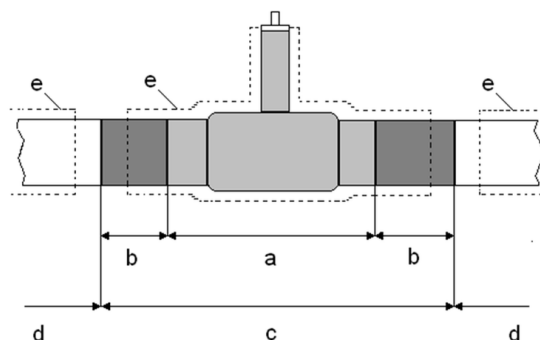
[SOURCE: EN ISO 6708:1995, 2.1, modified]

3.4

valve assembly

assembly of valve, valve extension pipe, PE-casing and PUR-foam

Note 1 to entry: Figure 1 gives an example of a valve assembly and its components.

**Key**

- a valve
- b valve extension pipe
- c valve assembly
- d service pipe
- e insulation

Figure 1 — Example valve assembly components**3.5
valve**

part of the valve assembly supplied by the valve manufacturer (with or without valve extension pipe)

**3.6
valve extension pipe**

pipe part of the valve assembly welded to the valve

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Note 1 to entry: The valve extension may be required before the insulation process. This can be done by the valve manufacturer or the insulation manufacturer. The valve can be extended with valve extension pipes before insulation or delivered by the valve manufacturer with extensions.

**3.7
steel service pipe**

service pipe according to EN 253:2009+A2:2015

4 Requirements**4.1 Pressure ratings for valves****4.1.1 General**

The valves shall be designed for use in pipe systems with a maximum operating pressure of 16 bar or 25 bar.

The valves shall be able to withstand a strength test pressure of the district heating system of 1,3 times the maximum operating pressure at ambient temperature in open and closed position.

4.1.2 Valves without indicated flow direction

Valves without an indicated flow direction shall support the pressure load in both directions.

4.2 Service temperatures for valves

The valves shall be able to withstand continuous operation with hot water at various temperatures in accordance with EN 253:2009+A2:2015 and at a minimum water temperature of 4 °C.

4.3 Steel parts

4.3.1 General

All valves, steel pipes and steel components used for manufacturing of valve assemblies under the scope of this European Standard shall as a minimum be delivered to the manufacturer with an inspection certificate 3.1 according to EN 10204. The manufacturer shall keep documentation of the inspection certificates.

In case a material related inspection certificate 3.1 according to EN 10204 is required by the client who orders the preinsulated valve assemblies, this information shall be given while placing the order with the manufacturer of the preinsulated valve assemblies.

NOTE Any later request for provision of such documentation can be too late and can possibly not be met by the manufacturer, since the manufacturer has to organize the assignment of 3.1 certificates to valves and valve assemblies before starting the production.

4.3.2 Valve

The valve shall be fully welded. Detachable joints, such as flanged or screwed connections, except sealing system at the stem, shall not be used in the pressurized area.

4.3.3 Valve extension pipe

The quality of the valve body shall match with the quality of the valve extension pipe.

4.3.4 Welding ends

The welding ends of the valve assembly shall match with the service pipe in accordance with EN 253:2009+A2:2015, 4.2.2.

Pipe ends shall be prepared in accordance with EN 448:2015, 4.1.10.3.

4.3.5 Welding of steel parts

Fusion welding between valves and valve extension pipe, shall be carried out in accordance with EN 448:2015, 4.1.10.

The quality of the steel at the welding ends of the valve or valve assembly shall match with steel of the service pipes.

Welding of pressurized parts of the valve assembly shall comply with EN 448:2015, 4.1.10.2 and 4.1.10.5.

4.4 Casing

4.4.1 General

The casing shall be in accordance with EN 448:2015 and EN 253:2009+A2:2015.

4.4.2 Requirements for polyethylene welding

The general requirements for polyethylene welding shall be in accordance with EN 448:2015, 4.4.3.

EN 488:2015 (E)**4.4.3 Diameter and wall thickness of the casing**

The outside diameter and the minimum wall thickness of the PE casing shall be in accordance with EN 448:2015, 4.4.5.

4.5 Polyurethane rigid foam insulation (PUR)**4.5.1 General**

The requirements for PUR shall be the same as in EN 448:2015, 4.3 when tested in accordance with 5.5 of this European Standard.

4.5.2 Minimum insulation thickness

The minimum insulation thickness shall be in accordance with EN 448:2015, 4.4.6.

4.6 Valve assembly**4.6.1 Ends of valve assembly****4.6.1.1 General**

The ends of the valve extension pipe of the valve assembly shall be prepared for welding according to 4.3.3 and shall be free from insulation for a minimum length of 150 mm. The tolerance in the declared value shall be ± 10 mm.

4.6.1.2 Centre line deviation

The distance between the centre lines of the valve extension pipe and the casing at the ends of the valve assembly shall not exceed the limits given in EN 253:2009+A2:2015, Table 7.

The centre line deviation shall be measured between the centre lines with the largest deviation.

4.6.1.3 Angular deviation

The angular deviation between the centre lines of the not insulated ends of the valve extension pipe at the length of 100 mm from the ends shall not exceed 2° .

The angular deviation shall be measured between the centre lines with the largest deviation.

4.6.2 End of stem construction

To ensure a long service life of the end stem passing through the casing, it shall withstand the aggressive underground condition such as heat, cold, moisture, ground and salty water. Where the stem construction passes the casing there shall be an arrangement to protect against water ingress to the insulation.

The stem construction outside the insulation shall be:

- made from stainless steel as defined in EN 10088-1:2014, 3.1, however minimum specified Cr-content is 16 %. Factors influencing the corrosion probability of the stainless steel construction can be assessed according to EN 12502-4.

Specifically used steel type is documented by appropriate quality management system;

NOTE Under specific installation and operation conditions a chrome content of 16 % alone might not be sufficient, so that other alloy elements are then recommended.

- or made from carbon steel and protected by a paint system securing durability range “high” according to EN ISO 12944-5. Underground installed valves shall be suitable for corrosivity