SLOVENSKI STANDARD
SIST EN 488:2020

01-januar-2020

Nadomešča:
SIST EN 488:2016

Cevi za daljinsko ogrevanje - Poviti enocevni sistemi za neposredno vkopana vročevodna omrežja - Tovarniško izdelan sestav jeklenih ventilov za jeklene delovne cevi, obdane s poliuretansko toplotno izolacijo in zaščitnim plaščem iz polietilena

District heating pipes - Bonded single pipe systems for directly buried hot water networks - Factory made steel valve assembly for steel service pipes, polyurethane thermal insulation and a casing of polyethylene

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

Tuyaux de chauffage urbain - Systèmes bloqués monotubes pour les réseaux d'eau chaude enterrés directement - Assemblages d'appareils de robinetterie manufacturés pour tubes de service en acier, isolation thermique en polyuréthane et tube de protection en polyéthylène

Ta slovenski standard je istoveten z: **EN 488:2019**

ICS:

23.040.07	Cevovodi za daljinsko ogrevanje in njihovi deli	Pipeline and its parts for district heat
23.060.01	Ventili na splošno	Valves in general
91.140.65	Oprema za ogrevanje vode	Water heating equipment

SIST EN 488:2020 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 488

October 2019

ICS 23.060.01

Supersedes EN 488:2015

English Version

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This European Standard was approved by CEN on 12 August 2019.

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

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Ref. No. EN 488:2019 E

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European foreword

This document (EN 488:2019) has been prepared by Technical Committee CEN/TC 107 “Prefabricated district heating and district cooling pipe system”, 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of an identical text or by endorsement, at the latest by April 2020, and conflicting national standards shall be withdrawn at the latest by April 2020.

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

This document supersedes EN 488:2015.

In comparison with the previous edition, the main changes in this new edition of EN 488 are:

— editorial changes to the new structure of standards prepared by the Technical Committee CEN/TC 107.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, 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 — Bonded single pipe systems for directly buried hot water networks — Factory made pipe assembly of steel service pipe, polyurethane thermal insulation and a casing of polyethylene*;

— EN 448, *District heating pipes — Bonded single pipe systems for directly buried hot water networks — Factory made fitting assemblies of steel service pipes, polyurethane thermal insulation and a casing of polyethylene;*

— EN 489-1, *District heating pipes — Bonded single and twin pipe systems for buried hot water networks — Part 1: Joint casing assemblies and thermal insulation for hot water networks in accordance with EN 13941-1*;

— EN 13941-1, *District heating pipes — Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks — Part 1: Design*;

— EN 13941-2, *District heating pipes — Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks — Part 2: Installation*;

— EN 14419, *District heating pipes — Bonded single and twin 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 — Bonded twin pipe systems for directly buried hot water networks — Part 1: Factory made twin pipe assembly of steel service pipes, polyurethane thermal insulation and one casing of polyethylene* ;

— EN 15698-2, *District heating pipes — Bonded twin pipe systems for directly buried hot water networks — Part 2: Factory made fitting and valve assemblies of steel service pipes, polyurethane thermal insulation and one casing of polyethylene*

— EN 17248, *District heating and district cooling pipe systems — Terms and definitions.*

1 Scope

This document specifies requirements and test methods for factory made thermally insulated bonded valve assemblies for hot water networks in accordance with EN 13941-1, comprising a steel valve, rigid polyurethane foam thermal insulation and a casing of polyethylene.

The valve assembly could also include the following additional elements: measuring wires, spacers and diffusion barriers.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. 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, *District heating pipes — Bonded single pipe systems for directly buried hot water networks — Factory made pipe assembly of steel service pipe, polyurethane thermal insulation and a casing of polyethylene*

EN 448, *District heating pipes — Bonded single pipe systems for directly buried hot water networks — Factory made fitting assemblies of steel service pipes, polyurethane thermal insulation and a 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 13941-1, *District heating pipes — Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks — Part 1: Design*

EN 13941-2, *District heating pipes — Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks — Part 2: Installation*

EN 14419, *District heating pipes — Bonded single and twin pipe systems for directly buried hot water networks — Surveillance systems*

EN 17248, *District heating and district cooling pipe systems — Terms and definitions*

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 736-1 and EN 17248 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

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 1,6 MPa or 2,5 MPa.

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 13941-1 and at a minimum water temperature of 4 °C.

4.3 Steel parts

4.3.1 General

Steel grades are specified in EN 13941-1.

All valves, steel pipes and steel components used for manufacturing of valve assemblies under the scope of this document shall as a minimum be delivered to the manufacturer with an inspection certificate 3.1 according to EN 10204. The inspection certificate shall on request be passed on to the customer.

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

Any later request for provision of such documentation can be too late and can possibly not be met by the manufacturer, since the manufacturer shall 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 13941-2.

Pipe ends shall be prepared in accordance with EN 448.

4.3.5 Welding of steel parts

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

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.

4.4 Casing

4.4.1 General

The casing shall be in accordance with EN 448 and EN 253.

4.4.2 Requirements for polyethylene welding

The general requirements for polyethylene welding shall be in accordance with EN 448.

4.4.3 Diameter and wall thickness of the casing

The outside diameter and the minimum wall thickness of the casing shall be in accordance with EN 253.

4.5 Polyurethane (PUR) foam thermal insulation

4.5.1 General

The requirements for thermal insulation shall be the same as in EN 253 when tested in accordance with 5.5 of this document.

4.5.2 Minimum thickness of thermal insulation

The minimum thickness of thermal insulation shall be in accordance with EN 448.

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 thermal insulation in accordance with EN 253.

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.

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 thermal insulation.

The stem construction outside the thermal 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.

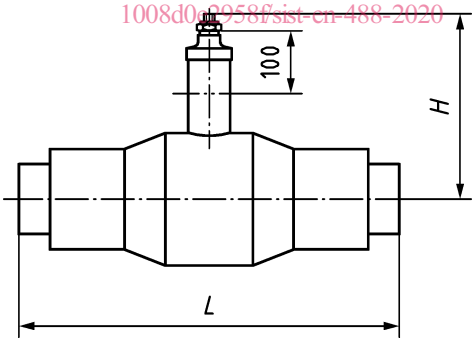
  Specifically used steel type is documented by appropriate quality management system;

  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 categories of Im1, Im2 and Im3 according to EN ISO 12944-2 and for atmospheric-corrosivity categories C5-M and C5-I according to EN ISO 12944-2.

  Specifically used paint system shall be according to EN ISO 12944-5 and documented by appropriate quality management system.

The protection by corrosion resistant material or corrosion protecting paint shall be added at the length of at least 100 mm from the top of the ‘stem house’ (see Figure 1).



Key

L Length

H High offset

Figure 1 — Anti corrosion protection of the stem construction

4.6.3 Main dimensions of the valve assembly

The main dimensions of the valve assembly H and L are shown in Figure 2.

The values of the main dimensions “L” and “H” shall be declared by the manufacturer.

The tolerances of the valve assembly dimensions shown in Figure 2 shall be in accordance with Table 1.

Table 1 — Tolerances on the main valve dimensions

DN	H mm	L mm
≤ 300	±5	±20
> 300	±10	±50

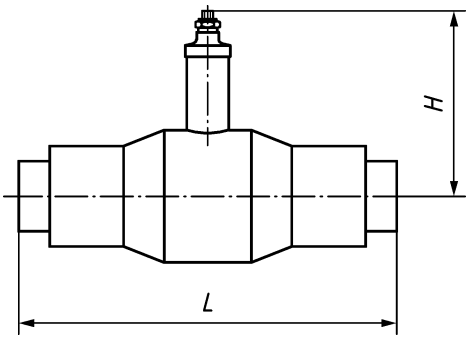


Figure 2 — Main dimensions

4.6.4 Installation of measuring elements

Measuring elements for surveillance systems shall be in accordance with EN 14419.

4.7 Requirements for effective operation and maintenance

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

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.

NOTE 1 Commonly used keyways are 19 mm, 27 mm, 36 mm, 50 mm and 60 mm or conical quadrangle 27 mm/ 32 mm.

Butterfly valves with nominal diameter DN 100 and larger, ball valves and gate 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.

NOTE 2 Commonly used keyways for connections for actuators are 60 mm, 70 mm and 90 mm, or conical quadrangle 27 mm/32 mm.

Valves shall be provided with a stop device that can be replaced without removing the thermal insulation and the casing. Alternatively, an internal stop device can be used. The internal stop device shall be designed to resist a maximum strength torque of at least twice the maximum operating torque specified by the manufacturer with a minimum of 150 Nm in the fully open and fully closed position of the valve. Using an internal stop device, the valve stem shall be designed to resist a maximum strength torque of at least 1,5 times the designed strength torque of the stop device.

The sealing around the stem shall be capable of being maintained without removing the thermal insulation and the casing.