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**Cevi za daljinsko ogrevanje - Poviti enocevni sistemi za neposredno vkopana vročevodna omrežja - 1. del: 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 - Part 1: Factory made steel valve assembly for steel service pipes, polyurethane thermal insulation and a casing of polyethylene

Fernwärmerohre - Einrohr-Verbundsysteme für direkt erdverlegte Fernwärmenetze - Teil 1: Werkmäßig gefertigte Stahlaraturenbaueinheit für Stahl-Mediumrohre, Wärmedämmung aus Polyurethan und einer Ummantelung aus Polyethylen

Tuyaux de chauffage urbain - Systèmes bloqués monotubes pour les réseaux d'eau chaude enterrés directement - Partie 1 : Assemblages d'appareils de robinetterie en acier manufacturés pour tubes de service en acier, isolation thermique en polyuréthane et enveloppe en polyéthylène

**Ta slovenski standard je istoveten z: prEN 488-1**

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## District heating pipes - Bonded single pipe systems for directly buried hot water networks - Part 1: Factory made steel valve assembly for steel service pipes, polyurethane thermal insulation and a casing of polyethylene

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

Fernwärmerohre - Einzelrohr-Verbundsysteme für direkt erdverlegte Fernwärmenetze - Werkmäßig gefertigte Stahl-Absperrarmaturen für Stahl-Mediumrohre, Wärmedämmung aus Polyurethan und einer Ummantelung aus Polyethylen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 107.

If this draft becomes a European Standard, 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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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

<b>Contents</b>	<b>Page</b>
European foreword.....	4
Introduction .....	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions .....	6
4 Requirements .....	6
4.1 General.....	6
4.2 Pressure ratings for steel valves .....	7
4.2.1 General.....	7
4.2.2 Valves without indicated flow direction.....	7
4.3 Service temperatures for valves .....	7
4.4 Steel parts .....	7
4.4.1 Specification.....	7
4.4.2 Valve.....	7
4.4.3 Valve extension pipes .....	7
4.4.4 Surface condition .....	8
4.4.5 Welding of steel parts.....	8
4.5 Casing .....	8
4.6 Polyurethane foam thermal insulation.....	8
4.6.1 General.....	8
4.6.2 Minimum thickness of thermal insulation.....	8
4.7 Valve assembly.....	8
4.7.1 General.....	8
4.7.2 Thermal insulation series .....	8
4.7.3 Ends of valve assembly.....	8
4.7.4 Polyethylene welding .....	9
4.7.5 End of stem construction.....	9
4.7.6 Tolerances of main dimensions.....	10
4.7.7 Expected thermal life and long term temperature resistance.....	10
4.7.8 Thermal conductivity .....	10
4.7.9 Surface conditions at delivery.....	10
4.7.10 Measuring wires for surveillance systems.....	10
4.8 Installation, operation and maintenance.....	10
4.8.1 Installation .....	10
4.8.2 Operation .....	10
4.8.3 Maintenance.....	11
4.9 Resistance to axial forces and bending moments.....	11
5 Test methods .....	11
5.1 General conditions and test specimens .....	11
5.2 Test specimens.....	11
5.2.1 Type testing of steel parts of the valve .....	11
5.2.2 Test specimens from casings and polyurethane foam thermal insulation .....	11
5.3 Steel parts .....	12
5.3.1 Type test of the steel parts.....	12
5.3.2 Production testing of steel valves .....	15

<b>6</b>	<b>Marking</b> .....	<b>16</b>
<b>6.1</b>	<b>General</b> .....	<b>16</b>
<b>6.2</b>	<b>Steel valve</b> .....	<b>16</b>
<b>6.3</b>	<b>Valve extension pipes</b> .....	<b>16</b>
<b>6.4</b>	<b>Casing</b> .....	<b>16</b>
<b>6.5</b>	<b>Valve assembly</b> .....	<b>16</b>
<b>Annex A (informative) Guidelines for inspection and testing</b> .....		<b>18</b>
<b>A.1</b>	<b>General</b> .....	<b>18</b>
<b>A.2</b>	<b>Manufacturer's type test</b> .....	<b>18</b>
<b>A.3</b>	<b>Manufacturer's quality control</b> .....	<b>18</b>
<b>A.4</b>	<b>Additional inspection</b> .....	<b>18</b>
<b>A.5</b>	<b>Extent of inspection</b> .....	<b>18</b>
<b>A.6</b>	<b>Manufacturer's responsibility</b> .....	<b>18</b>
<b>Annex B (normative) Resistance to axial force and bending moment</b> .....		<b>20</b>
<b>B.1</b>	<b>Axial strength test</b> .....	<b>20</b>
<b>B.2</b>	<b>Bending test</b> .....	<b>20</b>
<b>Annex C (normative) Resistance to bending forces</b> .....		<b>22</b>
<b>C.1</b>	<b>General</b> .....	<b>22</b>
<b>C.2</b>	<b>Standard test assembly (four point bending test)</b> .....	<b>23</b>
<b>C.2.1</b>	<b>Bending moment due to test load <math>F</math></b> .....	<b>23</b>
<b>C.2.2</b>	<b>Bending Moment due to uniform load <math>q</math> (pipe weight and if applicable the medium weight)</b> .....	<b>23</b>
<b>C.2.3</b>	<b>Bending moment due to valve weight <math>F_V</math></b> .....	<b>24</b>
<b>C.2.4</b>	<b>Total Bending Moment <math>M_{total}</math> due to <math>F</math>, <math>P</math> and <math>F_V</math></b> .....	<b>24</b>
<b>C.2.5</b>	<b>Calculation of test force <math>F</math></b> .....	<b>25</b>
<b>Annex D (informative) Waste treatment and recycling</b> .....		<b>26</b>
<b>Bibliography</b> .....		<b>27</b>

**prEN 488-1:2023 (E)****European foreword**

This document (prEN 488-1:2023) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 488:2019.

The main changes compared to the previous edition are listed below:

- alignment with the structure of EN 253;
- the valves shall be designed for an operating pressure of 2,5 MPa in accordance with 4.2.1;
- the requirements for the valve extension pipes are specified in 4.4.3;
- for the leak-tightness of the seat of the unloaded valves up to DN 400, a distinction is no longer made between different leakage rates, see 5.3.1.3;
- added requirement: Before measuring the torque, the valve shall be closed for 24 h, see 5.3.1.4;
- when marking the valve assemblies, information about the diffusion barrier is also to be provided, see 6.5.

The EN 488 series is currently composed of the following parts:

- prEN 488-1, *District heating pipes - Bonded single pipe systems for directly buried hot water networks - Part 1: Factory made steel valve assembly for steel service pipes, polyurethane thermal insulation and a casing of polyethylene* (this document);
- prEN 488-2, *District heating and district cooling pipes - Bonded pipe systems for directly buried hot and cold water networks - Part 2: Factory made steel valve assembly for draining and venting, polyurethane thermal insulation and a casing of polyethylene.*

## Introduction

prEN 488-1 has also been aligned with prEN 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*
- prEN 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*
- prEN 488-2, *District heating and district cooling pipes - Bonded pipe systems for directly buried hot and cold water networks - Part 2: Factory made steel valve assembly for draining and venting, 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 buried hot water networks - Surveillance systems*
- EN 15632 (all parts), *District heating pipes - Factory made flexible pipe systems*
- prEN 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*
- prEN 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*
- EN 17414 (all parts), *District cooling pipes - Factory made flexible pipe systems*
- EN 17415 (all parts), *District cooling pipes - Bonded single pipe systems for directly buried cold water networks*
- EN 17878 (all parts), *District heating pipes - Factory made flexible pipe systems with a lower temperature profile*

Waste management and recycling of materials is dealt with in Annex D.

**prEN 488-1:2023 (E)****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, valve extension pipes, polyurethane (PUR) foam thermal insulation and a casing of polyethylene.

The valve assembly can 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*

prEN 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 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* IST prEN 488-1:2023

<https://standards.iteh.ai/catalog/standards/sist/d87848c3-5fd0-43fd-845b->

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

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

**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 terminology databases for use in standardization at the following addresses:

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

**4 Requirements****4.1 General**

Unless otherwise specified, the requirements shall be valid for each single measurement.

For information on suitable guidelines for inspection and testing see Annex A.



## 4.2 Pressure ratings for steel valves

### 4.2.1 General

The steel valves shall be designed for use in pipe systems with a maximum operating pressure of 2,5 MPa.

NOTE For pressure testing of the pipe systems, see EN 13941-2.

### 4.2.2 Valves without indicated flow direction

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

## 4.3 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 1 °C.

The pressure temperature curve of the manufacturer shall be considered.

## 4.4 Steel parts

### 4.4.1 Specification

Steel grades are specified in EN 13941-1.

All steel valves, valve extension 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 client who orders the valve assembly, this request shall be given whilst placing the order with the manufacturer of the valve assemblies.

NOTE 1 Any later request for provision of such documentation could be too late and possibly can't be met by the manufacturer, since the manufacturer organizes the assignment of 3.1 certificates to the steel valves and parts of the steel service pipes before starting the production.

NOTE 2 For cold-formed steel valve bodies, the material certificates according to EN 10204 apply to the values of the chemical composition, but not to the values of the mechanical properties.

All components shall be designed in accordance with EN 13941-1, for the actions and stresses that normally occur during the service life of the valve assembly (or of the component).

### 4.4.2 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.

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

### 4.4.3 Valve extension pipes

Subject to design considerations other wall thicknesses than those given in EN 253 may be used, but in no case shall these be less than the minima indicated in EN 253.

The nominal diameter, the outside diameter, the tolerances on the diameter of the pipe ends and the wall thickness shall be the same as for the service pipes in accordance with EN 253.

**prEN 488-1:2023 (E)****4.4.4 Surface condition**

The surface conditions of the steel service pipe and the valve body shall be in accordance with EN 253.

**4.4.5 Welding of steel parts**

Fusion welding between the steel valve and the valve extension pipes also as the pressurized parts of the steel valve shall be carried out in accordance with prEN 448.

**4.5 Casing**

Material and casing properties shall be as specified in EN 253.

The polyethylene welding shall be in accordance with prEN 448.

**4.6 Polyurethane foam thermal insulation****4.6.1 General**

The PUR shall be in accordance with EN 253.

Test specimens from fitting assemblies to establish foam properties shall be taken in accordance with prEN 448.

**4.6.2 Minimum thickness of thermal insulation**

The minimum thickness of polyurethane foam thermal insulation shall be in accordance with prEN 448.

**4.7 Valve assembly****4.7.1 General**

All requirements are valid including the diffusion barrier, if any.

**4.7.2 Thermal insulation series**

The thermal insulation series shall be in accordance with EN 253,

The minimum thickness of the Polyurethane (PUR) foam thermal insulation shall be in accordance with prEN 448.

**4.7.3 Ends of valve assembly****4.7.3.1 Pipe ends without thermal insulation**

The ends of the extension pipes shall be free from insulation according to EN 253.

The ends of the extension pipes shall be prepared for welding according to prEN 448.

**4.7.3.2 Diameter and wall thickness of the casing**

The outside diameter and the minimum wall thickness after manufacturing of the valve assemblies shall be in accordance with EN 253.

**4.7.3.3 Centre line deviation**

The distance between the centre lines of the valve extension pipes 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.

#### 4.7.3.4 Angular deviation between valve extension pipes and casing

The angular deviation between the centre lines of the of the valve extension pipes and the casing shall not exceed the limits given in prEN 448.

The angular deviation shall be measured between the centre lines at the welding end of the valve assembly.

#### 4.7.3.5 Minimum length of casing

The length of the casing at the ends of the valves shall not be less than the limit given in prEN 448.

#### 4.7.4 Polyethylene welding

The polyethylene welding shall be in accordance with prEN 448.

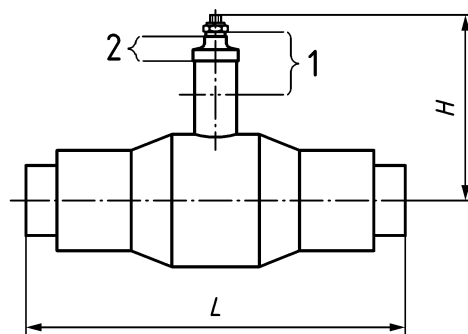
#### 4.7.5 End of stem construction

To ensure a long service life of the end stem passing through the shrinking sealing, the end of stem construction 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 with at least 16 % of chromium. 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.

The protection by corrosion resistant material shall be added at the length of at least 100 mm from the top of the 'stem house', see Figure 1.



#### Key

- $L$  length
- $H$  height offset
- 1 minimum length for corrosion resistant material (100 mm)
- 2 shrinking sealing

**Figure 1 — Main dimensions and anti corrosion protection**