

SLOVENSKI STANDARD
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Cevi za daljinsko ogrevanje - Izolirani vezani cevni sistemi za podzemeljska toplovodna omrežja - Sestav jeklenih ventilov za jeklene cevi, poliuretanske toplotne izolacije in zunanjega polietilenskega plašča

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 - Vorgedämmte 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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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

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

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prEN 488:2009 (E)

Foreword

This document (prEN 488:2009) has been prepared by Technical Committee CEN /TC 107, "Prefabricated district heating pipe systems", the secretariat of which is held by DS.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 488:2003.

Annex A is informative.

This document includes a Bibliography.

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Introduction

The first edition of EN 488 was approved in 1994. A complete revised standard was published in 2003. The main areas of the current revision are:

In general the whole standard has been edited to make it more readable requirements and test methods have been separated therefore clause numbers have changed and clauses have been split up in other clauses. Exact references for changes are not always possible.

- a) The scope has been amended. The standard applies no longer only to insulated valve assemblies for continuous operation with hot water at various temperatures in accordance with EN 253:2008, clause 1 but also to the valve assemblies with a maximum operation pressure of 25 bar. For higher pressure additional demands apply. It is also explained that the calculation rules of loads and stresses are not included. They depend on the configuration of the system as it is installed. The design and installation rules are given in EN 13941:2003.
- b) In Clause 3 'terms and definitions', definitions for the nominal pressure (PN) and the nominal size (DN) are added; A figure giving an example of a valve assembly and its components has been added.
- c) Clause 4 'requirements'
 - it is added that flange or screwed connections shall not be used except in the non-pressurized area e.g. for the stem extensions (clause 4.3.1);
 - the requirements for the use of stop devices are amended (clause 4.7);
 - the minimum water temperature has been adjusted to 4 °C (clause 4.2);
 - the new clause 4.3.3 has been changed and adjusted to EN 13941:2003 and the text in EN 448:2008;
 - Clause 4.1.6 has become Clause 4.8 "resistance to axial forces bending moments" and has been rewritten totally. For instance Clauses 5.3.1.4 and 5.3.1.6 have therefore been become renumbered and rewritten;
 - additions have been made to the requirements to the corrosion protection of the stem (see 4.6);
 - the clause 'increase in diameter' has been changed to 'diameter and wall thickness of the casing' (see 4.4.3);
 - a table with the tolerances of the main dimensions has been added together with a figure to explain the dimensions (see 4.6.3);
 - a clause was added about the installation of measuring elements for surveillance (see 4.6.4).
- d) Clause 5 'test methods'
 - the clause 'construction testing of the valves' has been adjusted to make the order of test more clear (see 5.3.1);
 - a test for the surveillance system is added (see 5.7).
- e) Clause 6 'marking'

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- for the casing the date of manufacture has been changed to year and week of manufacture (see 6.1.2);
 - for the valve assembly, the type of blowing agent has been added (see 6.1.3).
- f) Annex A 'guidelines for inspection and testing'
- the clause about quality surveillance had been changed in quality control (see A.2);
 - a table for the valve fitting inspection had been added.
- g) Former Annex B, the guidelines for installation of the valves has been deleted. New annexes B and C have been added, in which the actual testing is included.
- h) The former Table 1 "Service pipe dimensions and test forces" has been changed due to cold layer conditions. Therefore the compressive forces have been adapted. In this table the maximum allowable bending moments have been included and the table has been moved to Annex B.
- i) A description of the test method for bending forces has been added in Annex C.

In general, references were changed where needed. If possible references to European standards were used.

For information on the minimum expected thermal life with operation at various temperatures with respect to PUR foam performance see EN 253:2003.

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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 standard applies only to insulated valve assemblies for continuous operation with hot water at various temperatures in accordance with EN 253:2008, clause 1 and the valve assemblies with a maximum operation pressure of 25 bar. For higher pressures additional demands apply.

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

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

This standard does not include calculation rules of 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

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 (including amendments).

EN 19, *Marking of general purpose industrial valves*

EN 253:2008, *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 448:2003, *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 12266-1:2003, *Industrial valves – Testing of valves – Part 1: Pressure tests, test procedures and acceptance criteria – Mandatory requirements*

EN 13941:2003, *Design and installation of preinsulated bonded pipe systems for district heating*

EN 14419:2004, *District heating pipes – Preinsulated bonded pipe systems for directly buried hot water networks – Surveillance systems*

EN ISO 9001, *Quality management systems – Requirements (ISO 9001:2000)*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 253 and EN 448 apply.

For definition of types of valves see EN 736-1.

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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 It comprises the letters PN followed by a dimensionless number.

NOTE 2 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 The designation PN is not meaningful unless it is related to the relevant component standard number.

NOTE 4 The allowable pressure of a pipe work component depends on the PN number, the material and design of the component, its allowable temperature, etc., and is given in tables of pressure/temperature ratings specified in the appropriate standards.

3.2

nominal size (DN)

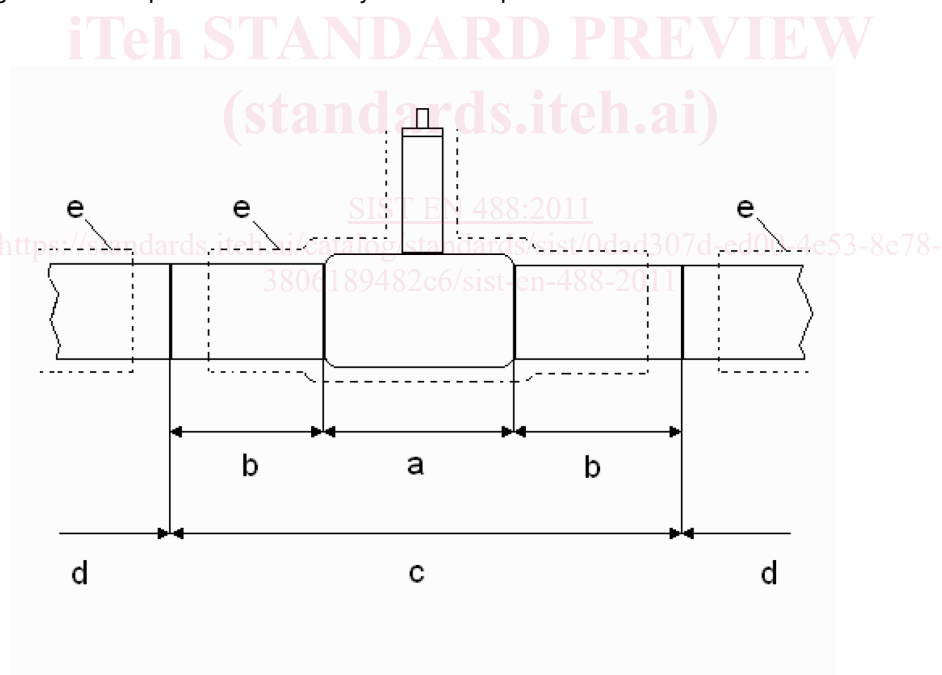
numerical metric designation of size is common to components in piping systems of any one size

3.3

valve assembly

assembly of valve body and stem, valve steel pipe or welded end, PE- casing and PUR-foam

NOTE 5 Figure 1 gives an example a valve assembly and its components.

**Key**

- | | |
|-----------------------------------|----------------|
| a Valve body and stem | d Service pipe |
| b Welded ends or valve steel pipe | e Insulation |
| c Valve assembly | |

Figure 1 — Example valve assembly components

3.4**valve steel pipe**

pipe part of the valve welded to the valve body

3.5**welding end on valve**

welding end of the valve body

3.6**steel service pipe**

service pipe according to EN 253:2008

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 test pressure of 1, 5 times the maximum operating pressure 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 253:2008, clause 1 and at a minimum water temperature of 4 °C.

4.3 Steel parts**4.3.1 Valve Body**

The valve body shall be fully welded. Flange or screwed connections shall not be used except in the non-pressurized area e.g. for the stem extensions.

4.3.2 Valve steel pipe

The quality of the valve steel pipe or welded end, to be welded to the valve body shall match with the steel quality of the valve body.

The external diameter of the valve steel pipe at the welding ends shall match with the external diameter of the welding ends of the valve body respectively the connecting steel service pipe.

4.3.3 Welding ends

The welding ends of the valve assembly shall match with the service pipe in accordance with EN 253:2008, clause 4.2.2.

Pipe ends shall be prepared in accordance with the welding procedure used. When using covered electrodes or gas-shielded metal-arc welding, pipe ends and fittings with equal wall thickness shall be prepared in accordance with EN-ISO 9692:1994, Table 1.

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Table 2 of this standard is derived from EN-ISO 9692:1994 Table 1 and gives the relation between wall thickness and reference number in Table 1.

Table 2 — Preparation of service pipe ends, valve steel pipe and valve body ends for weldings according to EN-ISO 9692:1994, Table 1

Wall thickness T of service pipe or valve steel pipe end	Reference number table 1 of ISO 9692-1
$T < 3 \text{ mm}$	1.2
$3 \text{ mm} \leq T \leq 10 \text{ mm}$	1.3
$T > 10 \text{ mm}$	1.5

Welding ends with different wall thicknesses shall be prepared and adapted for misalignment in accordance with table 3 and Figure 2 of this standard.

Table 3 - Adaptation of misalignment and difference in wall thickness

Misalignment	Adaptation	Remark
Difference in wall thickness		
Misalignment $h \leq 0,3 t$, max. 1 mm	Figure 2 detail A	Adjust to outside diameter
Misalignment $1 \text{ mm} < h \leq 10 \text{ mm}$		Adaptation of pipe ends
Misalignment $h > 10 \text{ mm}$	Extra fitting	Preinsulated reduction piece, Length ≥ 5 times misalignment
Differences in wall thickness: $t' \leq 1,5 t_n$	Figure 2 detail B	Adaptation of thicker wall t'
Differences in wall thickness: $t' > 1,5 t_n$	Figure 2 detail C	Adaptation both sides

Misalignment and preparation of butt welding ends shall be in accordance with Figure 2.