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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 Verbundmantelsysteme für direkt erdverlegte Fernwärmenetze - Vorgehängte Absperrarmaturen für Stahlmediumrohre mit Polyurethan-Wärmdämmung und Außenmantel aus Polyethylen

Tuyaux de chauffage urbain - Systemes 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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This European Standard was approved by CEN on 28 November 2002.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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**EN 488:2003 (E)****Foreword**

This document (EN 488:2003) has been prepared by Technical Committee CEN/TC 107 "Prefabricated district heating 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of an identical text or by endorsement, at the latest by August 2003, and conflicting national standards shall be withdrawn at the latest by August 2003.

This document supersedes EN 488:1994.

Annexes A and B are informative.

This document includes a Bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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## Introduction

The first edition of EN 488 was approved in 1994. The main areas of the revision are:

- the title has been amended by "District heating pipes";
- the term "underground" has been changed to "directly buried";
- the mentioning in the foreword of the production method "injected (poured)" has been deleted;
- two notes concerning commonly used types of valves and rules for calculation of loads and stresses in valve assemblies have been added to the scope;
- service pipes with nominal diameters from DN 700 up to and including DN 1200 have been added and the requirements have been amended accordingly;
- through the reference to EN 448 casings with nominal outside diameters from 900 mm up to and including 1400 mm have been added and the requirements have been amended accordingly;
- through the reference to EN 448 the requirements for polyethylene welding have been changed.

This specification is part of the standards for bonded systems using polyurethane foam thermal insulation applied to bond to a steel service pipe and a polyethylene casing.

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

The other standards from TC 107 are:

EN 253:2003, *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 489:2003, *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 13941:2003, *Design and installation of preinsulated bonded pipe systems for district heating.*

NOTE The following draft in connection with the above mentioned is under development:

prEN 14419, *District heating pipes – Preinsulated bonded pipe systems for directly buried hot water networks – Surveillance systems.*

## EN 488:2003 (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 preinsulated 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 clause 1 of EN 253:2003.

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

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

NOTE 1 For this application the following valve types are commonly used: ball valves, gate valves, and butterfly valves.

NOTE 2 This standard does not include rules for calculation of loads and stresses.

### 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, *Industrial valves – Marking of metallic valves.*

EN 253:2003, *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.*

ISO 5208:1993, *Industrial valves – Pressure testing of valves.*

### 3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 253:2003 and EN 448:2003 apply.

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

### 4 Requirements

#### 4.1 Steel parts

##### 4.1.1 General requirements for valves

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

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 mm, 27 mm, 36 mm, 50 mm 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 mm, 70 mm 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.

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

#### 4.1.2 Pressure ratings for 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 253:2003 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 4.2 of EN 253:2003.

#### 4.1.5 Welding ends on valves

The nominal diameter, the outside diameter and the tolerance on the outside diameter of the pipe ends shall be in accordance with 4.2.2 of EN 253:2003.

The wall thickness shall be in accordance with 4.2.3 of EN 253:2003.

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/mm<sup>2</sup> and an axial compressive stress of 144 N/mm<sup>2</sup>.

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.