SLOVENSKI STANDARD
oSIST prEN 17415-3:2020

01-september-2020

Cevi za daljinsko hlajenje - Spojeni enocevni sistemi za neposredno vkopana hladnovodna omrežja - 3. del: Tovarniško izdelan sestav jeklenih ventilov iz jeklene ali plastične delovne cevi, poliuretanske toplotne izolacije in polietilenskega plašča

District cooling pipes - Bonded single pipe systems for directly buried cold water networks - Part 3: Factory made steel valve assembly for steel or plastic service pipe, polyurethane thermal insulation and a casing of polyethylene

Fernkälterohre - Einzelrohr-Verbundsysteme für direkt erdverlegte Fernkältenetze - Teil 3: Werkmäßig gefertigte Stahl-Absperrarmaturen für Stahl- oder Kunststoff-Mediumrohre, einer Wärmedämmung aus Polyurethan und einer Ummantelung aus Polyethylen

Réseaux d'eau glacée - Systèmes bloqués de tuyaux pour les réseaux d'eau glacée enterrés directement — Partie 3 : Assemblages d'appareils de robinetterie manufacturés pour tubes de service en acier ou en plastique, isolation thermique en polyuréthane et tube de protection en polyéthylène

Ta slovenski standard je istoveten z: **prEN 17415-3**

ICS:

23.040.99	Drugi sestavni deli za cevovode	Other pipeline components

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EUROPEAN STANDARD

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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.

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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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Contents

Page

European foreword

This document (prEN 17415-3:2020) 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.

Introduction

Factory made bonded single pipe systems for directly buried district cooling networks are of common technical usage. In order to ensure quality including product-related service life, to assure safety in use, economical energy usage and to facilitate comparability in the market, CEN/TC 107 decided to set up standards for these products.

This document is one of a series of standards which form several parts of EN 17415, District cooling pipes – Bonded single pipe systems for directly buried cold water networks:

Part 1: *Factory made pipe assembly of steel or plastic service pipe, polyurethane thermal insulation and a casing of polyethylene*[1)];

Part 2: *Factory made fitting assemblies of steel or plastic service pipe, polyurethane thermal insulation and a casing of polyethylene*[1)];

Part 3: *Factory made steel valve assembly for steel or plastic service pipe, polyurethane thermal insulation and a casing of polyethylene*[1)];

The other standards from CEN/TC 107 covering this subject are:

EN 17414-1, *District cooling pipes – Factory made flexible pipe systems – Part 1: Classification, general requirements and test methods*[1)];

EN 17414-2, *District cooling pipes – Factory made flexible pipe systems – Part 2: Bonded system with plastic service pipes; requirements and test methods*[1)];

EN 17414-3, *District cooling pipes – Factory made flexible pipe systems – Part 3: Non bonded system with plastic service pipes; requirements and test methods*[1)];

EN ZZZZZ-1, *District cooling pipes – Design and installation of thermal insulated bonded single and twin pipe systems for directly buried cold water networks – Part 1: Design*[1)];

EN ZZZZZ-2, *District cooling pipes – Design and installation of thermal insulated bonded single and twin pipe systems for directly buried cold water networks – Part 2: Installation*[1)];

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

[1)] Under development.

1 Scope

This document specifies requirements, design and test methods for factory made thermally insulated bonded valve assemblies for directly buried district cooling distribution systems, comprising a steel valve from DN 15 to DN 1200, rigid polyurethane foam insulation and a casing of polyethylene.

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

This document applies only to insulated valve assemblies, for continuous operation with water at various temperatures (1 to 30)°C and a maximum operation pressure of 25 bar.

The design is based on an expected service life with continuous operation of a minimum 50 years.

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

EN 1092-1, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 1: Steel flanges*

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

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

EN 12201-2:2001+A1:2013, *Plastics piping systems for water supply, and for drainage and sewerage under pressure - Polyethylene (PE) - Part 2: Pipes*

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

prEN 17415-1, District cooling pipes — Bonded single pipe systems for directly buried cold water networks — Part 1: Factory made pipe assembly of steel or plastic service pipe, polyurethane thermal insulation and a casing of polyethylene1*)*

prEN 17415-2, District cooling pipes — Bonded single pipe systems for directly buried cold water networks — Part 2: Factory made fitting assemblies of steel or plastic service pipe, polyurethane thermal insulation and a casing of polyethylene*2)*

EN ISO 12944-2, *Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 2: Classification of environments (ISO 12944-2:2017)*

EN ISO 12944-5, *Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 5: Protective paint systems (ISO 12944-5:2019)*

CEN/TS 15223, *Plastics piping systems - Validated design parameters of buried thermoplastics piping systems*

3 Terms and definitions

For the purposes of this document the terms and definitions given in prEN 17415-1 and EN 736-1 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 16 bar or 25 bar.

The valves shall be able to withstand a strength test pressure of the district cooling 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 cold water at various temperatures in accordance with EN 17415-1.

4.3 Steel parts

4.3.1 General

Steel grades shall be in accordance with the steel material specifications in EN 17415-1.

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 client who orders the valve assemblies.

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

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 quality

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

4.3.4 Valve extension pipe ends

4.3.4.1 Valves for steel service pipe systems

The welding ends of the valve assembly shall match with the service pipe in accordance with prEN 17415-1.

Pipe ends shall be prepared in accordance with prEN 17415-2.

4.3.4.2 Valves for plastic service pipe systems

The ends of the extension pipes shall be designed in accordance with one of the following three alternatives:

1. Extension steel pipes with steel–to–PE transition fittings or alternatively steel–to–PB, –PE-X, –PE-RT, –PP or –multilayer plastic transition fittings. The plastic transition fitting ends shall match with adjacent plastic service pipes in accordance with prEN 17415-1. Plastic pipe ends shall be prepared in accordance with prEN 17415-2.
2. Extension steel pipe ends with welding neck flanges in accordance with EN 1092-1 for connection to adjacent plastic service pipes by using flange adaptors and backing flanges. The extension steel pipe ends including flanges shall be made from acid resistant stainless steel of steel grade minimum 1.4404 as defined in EN 10088-1.
3. Extension steel pipe ends with welding neck flanges as in alternative 2 but 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 outer diameter of a casing in accordance with prEN 17415-1 is bigger than the outer diameter of a welding neck flange only for a corresponding factory made pipe assembly with a Series 2 insulation thickness, i.e. the outer diameter of the flange must be specifically considered when a valve assembly with welding neck flanges is intended to be connected to adjacent pipe assemblies with a Series 1 or Series 0 insulation thickness.

4.3.5 Welding of steel parts

Fusion welding between valves and valve extension pipe, shall be carried out in accordance with prEN 17415-2.

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 prEN 17415-2.

4.3.6 Internal valve parts

Balls, gates and butterfly discs shall be made from stainless steel as specified in 4.6.2.

Ball valves and butterfly valves shall be soft-sealed.

4.4 Casing

4.4.1 General

The casing shall be in accordance with prEN 17415-2 and prEN 17415-1.

4.4.2 Requirements for polyethylene welding

The general requirements for polyethylene welding shall be in accordance with prEN 17415-2.

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 prEN 17415-1.

4.5 Polyurethane (PUR) foam thermal insulation

4.5.1 General

The requirements for thermal insulation shall be the same as in prEN 17415-1. The thermal insulation shall be tested in accordance with 5.5.

4.5.2 Minimum thickness of thermal insulation

The minimum thickness of the thermal insulation shall be in accordance with prEN 17415-2.

4.6 Valve assembly

4.6.1 Ends of valve assembly

4.6.1.1 General

The ends of the valve extension pipes of the valve assembly intended for steel service pipes shall be prepared for welding according to 4.3.4.1 and shall be free from thermal insulation in accordance with prEN 17415-1.

The ends of the transition fittings of the valve assembly intended for plastics service pipes shall be prepared for welding according to 4.3.4.2. The free plastic pipe part of the transition fitting shall be free from thermal insulation.

Valve assemblies with welding neck flanges intended for plastics service pipe joints shall be free from thermal insulation and casing in such a way that bolts for a flanged joint in accordance with 4.3.4.2 can be placed from the valve assembly side.

The casing of the valve assembly shall be sealed to the valve extension service pipes by end seals (end caps) that shall be heat-shrunk onto the service pipe ends as well as the casing ends.

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 prEN 17415-1.

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 stem end passing through the casing, it shall withstand the aggressive underground condition such as 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, however minimum specified Cr-content is 16 %.

NOTE Factors influencing the corrosion probability of the stainless steel construction can be assessed according to EN 12502-4.

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

Specifically used steel type shall be documented by appropriate quality management system.

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).

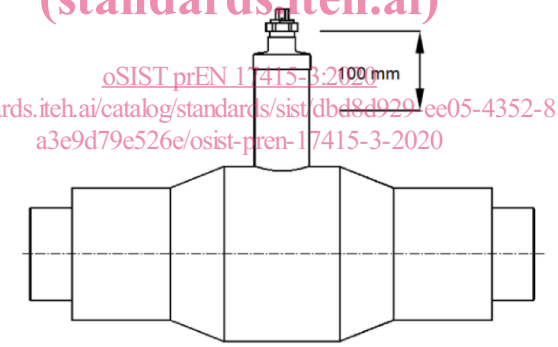


Figure 1 — Anti corrosion protection of the stem construction

4.6.3 Main dimensions of the valve assembly

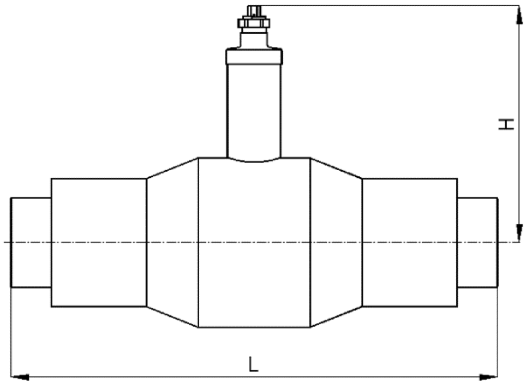
The main dimensions of the valve assembly H and L are shown in Figure 2.

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



Key

L length H high offset

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.