

SLOVENSKI STANDARD

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Nadomešča:
SIST EN 14419:2009

Cevi za daljinsko ogrevanje - Predizolirani enocevni ali dvocevni sistemi za vkopana vročevodna omrežja - Nadzorni sistemi

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

Fernwärmerohre - Werkmäßig gedämmte Verbundmantelrohrsysteme für erdverlegte Fernwärmenetze - Überwachungssysteme

Tuyaux de chauffage urbain - Systèmes bloqués de monotubes et bitubes pour les réseaux d'eau chaude enterrés - Systèmes de surveillance

Ta slovenski standard je istoveten z: **EN 14419:2019**

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23.040.07	Cevovodi za daljinsko ogrevanje in njihovi deli	Pipeline and its parts for district heat
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EUROPEAN STANDARD

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English Version

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

Tuyaux de chauffage urbain - Systèmes bloqués de monotubes et bitubes pour les réseaux d'eau chaude enterrés - Systèmes de surveillance

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

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 14419:2019) has been prepared by Technical Committee CEN/TC 107 “Prefabricated district heating and district cooling 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 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 14419:2009.

In comparison with the previous edition, the main changes in this new edition of EN 14419 are:

- editorial changes to the new structure of standards prepared by the Technical Committee CEN/TC107;
- Annexes A, B, F and I are informative. Annexes C, D, E, G and H are normative;
- terms and definitions from Clause 3 have been moved to EN 17248.

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

This document is a supplement to:

- 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 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 488, *District heating pipes — Bonded single pipe systems for directly buried hot water networks — Factors made steel valve assembly for steel service pipes, polyurethane thermal insulation and a casing of polyethylene*
- EN 489-1, *District heating pipes — Bonded single and twin pipe systems for directly 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 15632-1:2009+A1:2014, *District heating pipes - Pre-insulated flexible pipe systems - Part 1: Classification, general requirements and test methods*
- EN 15632-4, *District heating pipes — Pre-insulated flexible pipe systems — Part 4: Bonded system with metal service pipes; requirements and test methods*
- 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 pipe, 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 assembly of steel service pipes, polyurethane thermal insulation and outer 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 surveillance systems for directly buried hot water networks in accordance with EN 13941-1 and EN 13941-2.

This document specifies requirements for the manufacture of measuring elements, for the manufacture of factory made bonded pipe, fitting and valve assemblies with measuring elements as well as for the assembly of the measuring elements in the field.

All requirements and recommendations described in this document are based on the experience gained with existing surveillance systems and their principle function.

The specific requirements given are only valid for electrical wire based surveillance systems forming an integral part of the pipes, valves, fittings and joints.

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 61557-2, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. — Equipment for testing, measuring or monitoring of protective measures — Part 2: Insulation resistance*

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

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3 Terms and definitions

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For the purposes of this document, the terms and definitions are given in EN 17248.

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 Basic functional requirements

4.1 Dependency of manufacturer of pipe elements

The function of a surveillance system with similar measuring elements shall be independent of any manufacturer of pipe elements and of any Manufacturer of joints for pipe systems.

4.2 Performance

The surveillance system shall be able to perform:

- detection of moisture;
- detection of deviations;
- detection of multiple deviations;
- detection of disorders;
- location of moisture;
- location of disorders.

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NOTE The measuring system and type of technology used can vary provided the performance requirements listed can be achieved.

5 Manufacture of measuring elements**5.1 General requirements**

Measuring elements shall be part of a surveillance system that fulfils the basic functional requirements given in Clause 4.

5.2 Installation, assembly and operation

Measuring elements shall be suitable for installation, assembly and operating conditions with respect to thermal, mechanical and chemical conditions in pipe systems.

5.3 Characteristics

Measuring elements of a specific surveillance system shall have uniform system characteristics.

5.4 Reliability

Measuring elements shall have at least the same service life as a pipe system.

5.5 Maintenance

Measuring elements and other parts of the surveillance system for installation in the ground shall be maintenance free.

5.6 Longitudinal tightness

Measuring elements shall not influence the longitudinal water tightness of the pipe insulation negatively.

5.7 Marking of measuring elements

If the measuring elements are marked to indicate different functions, the marking shall be durable under normal operating conditions for pipe systems during the service life of the system.

5.8 Technical documentation**5.8.1 General**

The following documents shall be available on request:

5.8.2 For installation of measuring wires within pipe elements

— documents given in Annex C, Table C.1 positions No 1-6.

5.8.3 For assembly of measuring elements in the field

— documents given in Annex C, Table C.2 positions No 1-7.

5.8.4 For operation of a surveillance system

— documents given in Annex C, Table C.3 positions No 1-3.

6 Manufacture of pipe elements with measuring elements

6.1 General requirements

Measuring elements to be installed within pipe elements shall fulfil all the requirements given in Clause 5.

6.2 Compatibility test

6.2.1 Before series production

Before series production of pipe elements with measuring elements a compatibility test shall be made in order to ensure that system characteristics made available by the manufacturer of measuring elements (see 5.8.2) are fulfilled during the production.

6.2.2 Test procedure

The manufacturer of pipe elements shall develop and describe a test procedure that fulfils the requirements relevant for the specific surveillance system.

6.2.3 Replication of test

The compatibility test shall be replicated every time the production process is changed or the type of measuring element is changed.

6.3 Installation of measuring elements

6.3.1 Restrictions regarding type of measuring element

Only measuring wires shall be installed in pipe elements.

6.3.2 No electrical contact

The installation of measuring wires within pipe elements shall ensure that no electrical contact occurs between individual conductors of the measuring wires, between conductors and any service pipe or between conductors and any electrical conductive diffusion barrier.

NOTE The definition of electrical contact is given in Annex E.

6.3.3 Connections

Connections of measuring wires shall not be located in pipe elements.

Connection of measuring wires inside T-fittings can be accepted. The position of the connection shall be properly registered in the documentation material given in 6.8.

6.3.4 Geometry of installation

Measuring wires shall be installed inside the pipe elements in accordance with the technical documentation made available by the manufacturer of the measuring element, see 5.8.2.

The distance between measuring wire and the service pipe should be minimum 10 mm.

6.3.5 Spacers

In order to prevent the measuring wires being damaged during pipe element manufacturing, spacers used for positioning of the measuring wires inside the pipe elements shall be constructed and applied in such a way that the measuring wires are easily movable lengthwise before the manufacturing starts.

Pipe elements may be produced without spacers.

EN 14419:2019 (E)**6.3.6 Mechanical tightening**

If required before pipe element manufacturing, mechanical tightening of the measuring wire shall be performed within the limitations given in the technical documentation made available by the manufacturer of measuring element, see 5.8.2.

6.4 After pipe element manufacturing

All pipe elements shall fulfil the tests according to 6.6.

6.5 Measuring wires at free ends**6.5.1 Wire length**

Measuring wires led out at the end of the thermal insulation of pipe elements shall exceed the length of the service pipe with minimum 20 mm.

6.5.2 Protection of measuring wires

Measuring wires led out at the end of the thermal insulation of pipe elements shall be protected against damages during transport and handling.

The wires may be fixed to the thermal insulation.

6.6 Tests

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6.6.1 General

The following tests in 6.6.2 and 6.6.3 are acceptance tests for manufacturing of pipe elements with measuring element. Alternative tests may be used during production of the pipe element.

6.6.2 Continuity of measuring wire

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Test of continuity of measuring wires shall be performed by a loop test according to Annex D.

6.6.3 No electrical contact

Test for no electrical contact (see 6.3.2) shall be made by measuring of the electrical insulation resistance by a high voltage test. Method and criteria for passing of test are given in Annex E.

6.7 Quality control programme

Activities in accordance with Annex F, F.2 should be incorporated in the quality control programme of the manufacturer.

6.8 Technical documentation**6.8.1 General**

The following documents shall be available on request:

6.8.2 For assembly of measuring elements in the field

- Documents made available by the manufacturer of measuring element, see 5.8.3;
- Documents given in Annex C, Table C.2 position No 8.

6.8.3 For operation of a surveillance system

- Documents made available by the manufacturer of measuring element, see 5.8.4;
- Documents given in Annex C, Table C.3 positions No 3.

7 Assembly of measuring elements in field

7.1 Check upon receipt of pipe elements

A quality check should be made upon receipt of pipe elements. The following activities should be included:

- check for continuity of measuring wire by a loop resistance test according to Annex G;
- check for no electrical contact by measuring of the electrical insulation resistance according to Annex H;
- visual check of wiring ends for damages.

7.2 Extension of an existing measuring section

7.2.1 Actual state

For principle parts of a measuring section see Annex B and Figure B.1.

Before extending or renovating an existing measuring section, the actual state shall be measured and documented by measurements similar to the tests described in Annex G and Annex H.

NOTE The measurements are important for the delimitation between the existing and the extended system.

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Special attention should be made when pipe elements with diffusion barrier or twin pipes is mixed with pipe elements without diffusion barrier and twin pipes.

7.2.2 Change of system

In the case of a change in characteristics of the surveillance system a connection point shall be established in order to perform separate measurement.

7.3 Wiring design diagram

A wiring design diagram shall be available before the assembly work can take place.

7.4 Assembly work in joints

Connections and installation of measuring elements in joints shall be made in accordance with the instructions and specifications made available by the manufacturer of measuring element, see 5.8.3.

Ordinary electrical wire or any other kind of unauthorised wire is not allowed to form part of the assembly. All wires to be installed shall be designated by the manufacturer of the measuring elements.

7.5 Assembly check

Checks specific to the respective surveillance system shall be carried out continuously during the assembly work.

NOTE Description and specification for the different checks and the required equipment to be used are made available by the manufacturer of measuring element, see 5.8.3.