



BSI Standards Publication

District heating pipes — Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks

Part 1: Design

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National foreword

This British Standard is the UK implementation of EN 13941-1:2019+A1:2021. It supersedes BS EN 13941-1:2019, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by A1 A1.

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English Version

District heating pipes - Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks - Part 1: Design

Tuyaux de chauffage urbain - Conception et installation des systèmes bloqués de monotubes ou bitubes isolés thermiquement pour les réseaux d'eau chaude enterrés directement - Partie 1 : Conception

Fernwärmerohre - Auslegung und Installation von gedämmten Einzel- und Doppelrohr-Verbundsystemen für direkt erdverlegte Heißwasser-Fernwärmenetze - Teil 1: Auslegung

This European Standard was approved by CEN on 14 December 2018 and includes Amendment 1 approved by CEN on 15 October 2021.

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European foreword

This document (EN 13941-1:2019+A1:2021) 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 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of an identical text or by endorsement, at the latest by June 2022, and conflicting national standards shall be withdrawn at the latest by June 2022.

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 A1 EN 13941:2019 A1.

This document includes Amendment 1 approved by CEN on 15 October 2021.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

EN 13941, *District heating pipes — Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks* consists of the following parts:

- *Part 1: Design;*
- *Part 2: Installation.*

In comparison to EN 13941:2009+A1:2010, the following changes have been made:

- a) EN 13941 is considered to be the "system standard", including all requirements for materials and components and where necessary referring to the related product standards;
- b) chapters related to installation are moved to EN 13941-2;
- c) terms and definitions are moved to EN 17248;
- d) the document structure is improved, giving a better balance between standard text and annexes;
- e) twin pipes are included in a new Annex E;
- f) Annex H: "Scope of EN 13941 in relation to Pressure Equipment Directive (PED)" was added;
- g) requirements for horizontal and vertical stability and for parallel excavations are made more explicit;
- h) minimum free distances between parallel pipes are introduced as well as a warning to be aware of works of third parties that might endanger the integrity or the required design conditions of the district heating pipes;
- i) requirements for horizontal directional drillings are included (also in EN 13941-2);
- j) required properties and testing methods for expansion cushions are included;
- k) a design fatigue curve for fillet welds (e. g. in single use compensators) is included;

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l) the use of stress concentration factors for butt welds in district heating pipes is, in line with present international pipeline codes, not considered necessary anymore;

m) a great number of smaller adjustments and editorial improvements.

Ⓐ In comparison to EN 13941-1:2019, the following changes have been made:

a) minor corrections throughout the document. Ⓐ

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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.

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Introduction

This document has been prepared by CEN/TC 107/WG 13 "Prefabricated district heating and district cooling pipe system".

According to the scope of CEN/TC 107:

- the task of CEN/TC 107/WG 13 is to specify rules for design, calculation and installation for factory made thermal insulated bonded single and twin pipe systems for directly buried hot water networks;
- CEN/TC 107/WG 13 also contributes to rules for functional tests for thermal-insulated bonded pipe systems for underground hot water networks;

When use is made of the standard, the different sections of which it is made up is to be interpreted as being interdependent and, because of this, cannot be dissociated.

The revision of EN 13941:2009+A1:2010 involves the subdivision of the document in two separate documents:

- 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*.

This volume (Part 1) consists of a main part and eight annexes.

Annexes A, and F are normative. Annexes B, C, D, E, G, H, I, J and K are informative.

This document contains a number of requirements aimed at ensuring the sound execution of distribution networks and transportation pipelines for district heating.

The requirements and regulations contained in this document should be assessed and applied in compliance with the intentions of the standard and in due consideration of the development taking place in the field it concerns. It is therefore assumed that the user of the standard has the requisite technical insight and that the user of the standard has adequate knowledge of legal and other external regulations that are of consequence to the practical application of the standard.

NOTE Some paragraphs of this standard are possibly covered by national regulations in some countries which naturally apply instead of this standard.

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1 Scope

This document specifies requirements for design, calculation and installation of factory made thermal insulated bonded single and twin pipe systems for buried hot water networks for continuous operation with treated water at various temperatures up to 120 °C and occasionally peak temperatures up to 140 °C for maximum 300 h/a, and maximum internal pressure 2,5 MPa.

Flexible pipe systems according to the EN 15632 series are not under the scope of this standard.

The standard EN 13941, *Design and installation of thermal insulated bonded single and twin pipe systems for directly buried hot water networks* consists of two parts:

a) EN 13941-1: *Design*;

b) EN 13941-2: *Installation*.

The requirements in this part, EN 13941-1, form a unity with those of EN 13941-2.

The principles of the standard may be applied to thermal insulated pipe systems with pressures higher than 2,5 MPa, provided that special attention is paid to the effects of pressure.

Adjacent pipes, not buried, but belonging to the network (e.g. pipes in ducts, valve chambers, road crossings above ground etc.) may be designed and installed according to this standard.

This document presupposes the use of treated water, which by softening, demineralization, de-aeration, adding of chemicals, or otherwise has been treated to effectively prevent internal corrosion and deposits in the pipes.

NOTE For further information on water qualities to be used in district heating pipe systems see also bibliographic entry [2].

This standard is not applicable for such units as:

a) pumps;

b) heat exchangers;

c) boilers, tanks;

d) systems behind domestic substations.

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 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 outer casing of polyethylene*

EN 448, *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 488, *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*