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District cooling pipes - Factory made flexible pipe systems - Part 1: Classification, general requirements and test methods

## EESTI STANDARDI EESSÕNA

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EUROPEAN STANDARD

EN 17414-1

NORME EUROPÉENNE

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ICS 23.040.99

English Version

**District cooling pipes - Factory made flexible pipe systems  
- Part 1: Classification, general requirements and test  
methods**

Réseaux d'eau glacée - Systèmes de tuyaux flexibles  
manufacturés - Partie 1 : Classification, prescriptions  
générales et méthodes d'essai

Fernkälterohre - Werkmäßig gefertigte flexible  
Rohrsysteme - Teil 1: Klassifikation, allgemeine  
Anforderungen und Prüfung

This European Standard was approved by CEN on 22 June 2020.

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## European foreword

This document (EN 17414-1:2020) 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 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of an identical text or by endorsement, at the latest by January 2021, and conflicting national standards shall be withdrawn at the latest by January 2021.

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.

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## Introduction

Factory made flexible pipe systems for directly buried district cooling networks are of common technical usage. In order to ensure quality including product-related service life, to ensure 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 17414, *District cooling pipes – Factory made flexible pipe systems*:

- *Part 1: Classification, general requirements and test methods* (this document);
- *Part 2: Bonded system with plastic service pipes - Requirements and test methods*;
- *Part 3: Non bonded system with plastic service pipes - Requirements and test methods*.

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

- EN 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 polyethylene*;
- EN 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*<sup>1</sup>;
- EN 17415-3, *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*<sup>1</sup>;
- 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*<sup>1</sup>;
- 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*<sup>1</sup>;
- 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 buried hot water networks - Surveillance systems*;

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<sup>1</sup> Under preparation.

## 1 Scope

This document specifies requirements and test methods for factory made thermally insulated flexible pipe-in-pipe assemblies for directly buried district cooling distribution systems, comprising a service pipe and a casing of polyethylene. The pipe assembly can also include the following additional elements: measuring wires, spacers and diffusion barriers.

This document is intended to be used in conjunction with EN 17414-2 or EN 17414-3.

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

The design is based on an expected service life with continuous operation of a minimum 50 years. For pipe systems with plastic service pipes, the respective temperature profiles are defined in EN 17414-2 and EN 17414-3.

NOTE For the transport of other liquids, for example potable water, additional requirements could be applicable.

## 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 1605, *Thermal insulating products for building applications - Determination of deformation under specified compressive load and temperature conditions*

EN 1606, *Thermal insulating products for building applications - Determination of compressive creep*

EN 12085, *Thermal insulating products for building applications - Determination of linear dimensions of test specimens*

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*

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

EN 60811-406:2012, *Electric and optical fibre cables - Test methods for non-metallic materials - Part 406: Miscellaneous tests - Resistance to stress cracking of polyethylene and polypropylene compounds*

EN 17415-1:2020, *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*

EN ISO 845, *Cellular plastics and rubbers - Determination of apparent density (ISO 845)*

EN ISO 3127, *Thermoplastics pipes - Determination of resistance to external blows - Round-the-clock method (ISO 3127)*

EN ISO 9967, *Thermoplastics pipes - Determination of creep ratio (ISO 9967)*

EN ISO 9969, *Thermoplastics pipes - Determination of ring stiffness (ISO 9969)*

EN ISO 11357-6, *Plastics - Differential scanning calorimetry (DSC) - Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT) (ISO 11357-6)*

EN ISO 16871, *Plastics piping and ducting systems - Plastics pipes and fittings - Method for exposure to direct (natural) weathering (ISO 16871)*

ISO 6964, *Polyolefin pipes and fittings — Determination of carbon black content by calcination and pyrolysis — Test method*

ISO 16770, *Plastics — Determination of environmental stress cracking (ESC) of polyethylene — Full-notch creep test (FNCT)*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 17248 and the following 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>

#### 3.1

##### **compressive creep**

slow progressive strain under the influence of stresses caused by compressive forces

#### 3.2

##### **flexibility**

ability to withstand the flexibility test

#### 3.3

##### **insulation layer**

layer which provides the designated thermal characteristics of the pipe assembly

#### 3.4

##### **insulation material**

material which reduces the heat loss

#### 3.5

##### **operating pressure**

pressure at which the cold water network is designed to operate continuously

#### 3.6

##### **pipe assembly**

assembled product, consisting of at least one service pipe, insulating material and casing

#### 3.7

##### **single pipe system**

SPS

pipe system with two single service pipes (one supply pipe and one return pipe)