
**Cevi za daljinsko hlajenje - Tovarniško izdelani gibki cevni sistemi - 3. del:
Nevezani sistem z delovnimi cevmi iz polimernih materialov - Zahteve in
preskusne metode**

District cooling pipes - Factory made flexible pipe systems - Part 3: Non bonded system
with plastic service pipes - Requirements and test methods

Fernkühlungsrohre - Werkmäßig gedämmte flexible Rohrsysteme - Teil 3: Nicht-Verbund-
Rohrsysteme mit Mediumrohren aus Kunststoff - Anforderungen und Prüfungen

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Réseaux d'eau glacée - Systèmes de tuyaux flexibles manufacturés - Partie 3 : Système
non bloqué avec tube de service en plastique - Prescriptions et méthodes d'essai

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EUROPEAN STANDARD

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District cooling pipes - Factory made flexible pipe systems - Part 3: Non bonded system with plastic service pipes; requirements and test methods

Réseaux d'eau glacée - Systèmes de tuyaux flexibles
manufacturés - Partie 3 : Système non bloqué avec tube
de service en plastique - prescriptions et méthodes
d'essai

Fernkälterohre - Werkmäßig gefertigte flexible
Rohrsysteme - Teil 3: Nicht-Verbundrohrsysteme mit
Mediumrohren aus Kunststoff - Anforderungen und
Prüfungen

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

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European foreword

This document (EN 17414-3:2020) 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 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of an identical text or by endorsement, at the latest by January 2021, and conflicting national standards shall be withdrawn at the latest by January 2021.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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EN 17414-3:2020 (E)

Introduction

Factory made flexible non bonded pipe systems with plastic service pipes 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;*
- *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 (this document).*

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 polyethylene¹;*
- 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 polyethylene¹;*
- 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: Design¹;*
- 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: Installation¹;*
- 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.*

Waste management and recycling of materials is dealt with in Annex C.

¹ Under preparation.

1 Scope

This document specifies requirements and test methods for factory made thermally insulated non-bonded 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 17414-1.

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.

This document does not cover surveillance systems.

In conjunction with the other parts of EN 17414, this document is applicable to pipes, fittings, their joints and to joints with components made of non-plastics materials intended to be used for district cooling installations.

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 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 12201-1, *Plastics piping systems for water supply, and for drainage and sewerage under pressure - Polyethylene (PE) - Part 1: General*

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

EN 12201-3, *Plastics piping systems for water supply, and for drainage and sewerage under pressure - Polyethylene (PE) - Part 3: Fittings*

EN 12201-5, *Plastics piping systems for water supply, and for drainage and sewerage under pressure - Polyethylene (PE) - Part 5: Fitness for purpose of the system*

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

EN ISO 15874-1, *Plastics piping systems for hot and cold water installations - Polypropylene (PP) - Part 1: General (ISO 15874-1)*

EN ISO 15874-2, *Plastics piping systems for hot and cold water installations - Polypropylene (PP) - Part 2: Pipes (ISO 15874-2)*

EN ISO 15874-3, *Plastics piping systems for hot and cold water installations - Polypropylene (PP) - Part 3: Fittings (ISO 15874-3)*

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EN ISO 15874-5, *Plastics piping systems for hot and cold water installations - Polypropylene (PP) - Part 5: Fitness for purpose of the system (ISO 15874-5)*

EN ISO 15875-1, *Plastics piping systems for hot and cold water installations - Crosslinked polyethylene (PE-X) - Part 1: General (ISO 15875-1)*

EN ISO 15875-2, *Plastics piping systems for hot and cold water installations - Crosslinked polyethylene (PE-X) - Part 2: Pipes (ISO 15875-2)*

EN ISO 15875-3, *Plastics piping systems for hot and cold water installations - Crosslinked polyethylene (PE-X) - Part 3: Fittings (ISO 15875-3)*

EN ISO 15875-5, *Plastics piping systems for hot and cold water installations - Crosslinked polyethylene (PE-X) - Part 5: Fitness for purpose of the system (ISO 15875-5)*

EN ISO 15876-1, *Plastics piping systems for hot and cold water installations - Polybutene (PB) - Part 1: General (ISO 15876-1)*

EN ISO 15876-2, *Plastics piping systems for hot and cold water installations - Polybutene (PB) - Part 2: Pipes (ISO 15876-2)*

EN ISO 15876-3, *Plastics piping systems for hot and cold water installations - Polybutene (PB) - Part 3: Fittings (ISO 15876-3)*

EN ISO 15876-5, *Plastics piping systems for hot and cold water installations - Polybutene (PB) - Part 5: Fitness for purpose of the system (ISO 15876-5)*

EN ISO 21003-1, *Multilayer piping systems for hot and cold water installations inside buildings - Part 1: General (ISO 21003-1)*

<https://standards.iteh.ai/catalog/standards/sist/4bb7a63f-792b-4fd-97f4-4b4b2ab67f42/sist-en-17414-3-2020>

EN ISO 21003-2, *Multilayer piping systems for hot and cold water installations inside buildings - Part 2: Pipes (ISO 21003-2)*

EN ISO 21003-3, *Multilayer piping systems for hot and cold water installations inside buildings - Part 3: Fittings (ISO 21003-3)*

EN ISO 21003-5, *Multilayer piping systems for hot and cold water installations inside buildings - Part 5: Fitness for purpose of the system (ISO 21003-5)*

EN ISO 22391-1, *Plastics piping systems for hot and cold water installations - Polyethylene of raised temperature resistance (PE-RT) - Part 1: General (ISO 22391-1)*

EN ISO 22391-2, *Plastics piping systems for hot and cold water installations - Polyethylene of raised temperature resistance (PE-RT) - Part 2: Pipes (ISO 22391-2)*

EN ISO 22391-3, *Plastics piping systems for hot and cold water installations - Polyethylene of raised temperature resistance (PE-RT) - Part 3: Fittings (ISO 22391-3)*

EN ISO 22391-5, *Plastics piping systems for hot and cold water installations - Polyethylene of raised temperature resistance (PE-RT) - Part 5: Fitness for purpose of the system (ISO 22391-5)*

3 Terms and definitions

For the purposes of this document the terms and definitions given in EN 17414-1 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 Classification

4.1 Operating temperatures and service life

Pipe systems according to this document are designed for a service life of 50 years when operated with temperature profiles within (1 to 30) °C.

The maximum continuous operating temperature shall not exceed 30 °C.

4.2 Design pressures

Pipe systems according to this document are designed for continuous operating pressures of up to 25 bar.

Table 1 defines the maximum SDR ratios of the service pipe required to withstand different operating pressures at a nominal temperature of 30 °C (see Annex A, Example 3).

Table 1 — Maximum SDR ratios for operating pressures 6 to 25 bar

Service pipe material	Operating pressure				
	6 bar	10 bar	16 bar	20 bar	25 bar
PB-1	33	21	13,6	11	9
PP-RCT	26	13,6	9	7,4	6
PE 100, PE-X, PE-RT Type II, PP-H, PP-R	21	13,6	9	7,4	6
PE 80, PP-B	17	11	7,4	6	5
Multilayer pipes	Wall thicknesses shall be calculated according to the methods defined in EN ISO 21003-2.				

NOTE 1 A higher SDR could be applicable for a lower temperature profile (see Annex A, Example 1).

NOTE 2 The calculation of the SDR ratios is based on EN ISO 15494 with the safety factor 1,25 for a service life of 50 years. Annex A shows calculations for other temperatures (20°C and 25°C).

NOTE 3 The available pipe diameters need to be checked with the manufacturer. Some SDR ratios are not suitable for all diameters, as connection methods (e.g. polyfusion welding) require certain minimum wall thicknesses.

NOTE 4 Plastic pipe materials offer a wider range of pressure ratings for specific temperature/lifetime profiles. Manufacturers are offering more detailed tables and calculations to design the best solution.