

SLOVENSKI STANDARD oSIST prEN 17414-3:2019

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Cevi za daljinsko hlajenje - Tovarniško izdelani sistemi gibkih cevi - 3. del: Nespojeni sistem s plastičnimi delovnimi cevmi - 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

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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23.040.99 Drugi sestavni deli za cevovode

Other pipeline components

oSIST prEN 17414-3:2019

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

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

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prEN 17414-3:2019 (E)

Contents

Europ	ean foreword	3
Introd	uction	4
1	Scope	5
2	Normative references	5
3	Terms and definitions	6
4 4.1 4.2	Classification Operating temperatures and service life Operating pressures	6 6 6
5 5.1 5.2 5.2.1 5.2.2 5.3 5.4	Requirements General requirements Service pipes and fittings Complying piping systems Oxygen tightness Sealing in linear direction Water vapour permeation	7 7 7 8 8 8
6	Test procedures	8
Annex	A (informative) Application of Miner's Rule	9
Biblio	graphy1 <u>SIST EN 17414-3:2020</u> https://standards.iteh.ai/catalog/standards/sist/4bb7a63f-792b-4f1d-97f4-	2

European foreword

This document (prEN 17414-3:2019) has been prepared by Technical Committee CEN/TC 107 "Prefabricated district heating and cooling pipe systems", the secretariat of which is held by DS.

This document is currently submitted to the CEN Enquiry.

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prEN 17414-3:2019 (E)

Introduction

Factory made flexible pipe systems for directly buried district cooling networks are of common technical usage. In order to assure 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 prEN 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:

- 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 polyethylene;
- prEN YYYY-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);
- prEN YYYYY-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;
- prEN YYYY-4, District cooling pipes Bonded single pipe systems for directly buried cold water networks Part 4: Joint casing assemblies of polyurethane thermal insulation and a casing of polyethylene for steel or plastic service pipes¹;
- prEN ZZZZ-1[,] District cooling pipes Design and installation of thermal insulated bonded single and twin pipe systems for directly buried cold water networks – Part 1: Design²);
- prEN ZZZZ-2, District cooling pipes Design and installation of thermal insulated bonded single and twin pipe systems for directly buried cold water networks – Part 2: Installation²);
- prEN UUUUU, District cooling pipes Factory made bonded pipe systems for directly buried cold water networks – Surveillance systems²).

¹⁾ Under development.

²⁾ Under development.

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 from DN 15 to DN 200 and a casing of polyethylene. The pipe assembly may also include the following additional elements: measuring wires, spacers and diffusion barriers.

This document is intended to be used in conjunction with prEN 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.

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

2 Normative references

The following referenced documents are indispensable for the application 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 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

prEN 17414-1:2019, 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)

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)

prEN 17414-3:2019 (E)

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)

ISO 17455, Plastics piping systems – Multilayer pipes – Determination of the oxygen permeability of the barrier pipe

ISO 21004, Plastics piping systems – Multilayer pipes and their joints, based on thermoplastics, for water supply

https://standards.iteh.ai/catalog/standards/sist/4bb7a63f-792b-4f1d-97f4-

3 Terms and definitions 4b4b2ab67f42/sist-en-17414-3-2020

For the purposes of this document the terms and definitions given in prEN 17414-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <u>http://www.electropedia.org/</u>
- ISO Online browsing platform: available at <u>http://www.iso.org/obp</u>

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 and profiles of 1 °C at 50 years and of 30 °C at 50 years.

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

4.2 Operating pressures

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

Tables 1 and 2 defines SDR ratios of the service pipe required to withstand the operating pressures at a nominal temperature of 30 °C (see Annex A, Example 3).

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

Service pipe	Operating Pressure			
material	6 bar	10 bar		
PB-H, PB-R, PP-RCT	SDR 26	SDR 17		
PE-X, PP-R	SDR 13,6	SDR 11		
PE 100	SDR 21	SDR 13,6		
PE 80	SDR 13,6	SDR 11		
Multilayer pipes	Wall thickn calculated the metho ISO	esses shall be according to ds defined in 21004		

Table 1 — SDR ratios required for operating pressures 6 to 10 bar

NOTE 2 For PB-H, PB-R, PP-RCT, PE-X and PP-R the maximum operating pressure is 10 bar according to the reference standards as given in 5.2.1.

Table 2 — SDR ratios required for operating pressures 16 to 25 bar

	Service pipe material	CONTRACTOR OF STATES OF STATES			
		16 bar	20 bar	25 bar	
https://stop	PE 100	SDR 9	SDR 7,4	SDR 6	7£/
mups.//stan	PE 80ab67f42	SDR 7,4	SDR 6	-///20-+11u-/	/ 1-

5 Requirements

5.1 General requirements

In addition to the general requirements defined in prEN 17414-1 the following product specific requirements apply.

5.2 Service pipes and fittings

5.2.1 Complying piping systems

Plastics service pipes and fittings shall comply with:

- EN 12201-1, EN 12201-2, EN 12201-3, EN 12201-5, for pipes made of polyethylene (PE),
- EN ISO 15874-1, EN ISO 15874-2, EN ISO 15874-3, EN ISO 15874-5, for pipes made of polypropylene (PP),
- EN ISO 15875-1, EN ISO 15875-2, EN ISO 15875-3 and EN ISO 15875-5, for pipes made of cross linked polyethylene (PE-X).

All requirements of the pipe and fitting according to EN ISO 15875-2 and EN ISO 15875-3, especially the degree of cross-linking shall be met before leaving the production site.

- EN ISO 15876-1, EN ISO 15876-2, EN ISO 15876-3 and EN ISO 15876-5, for pipes made of polybutene (PB),
- ISO 21004, for multi-layer pipes.

5.2.2 Oxygen tightness

The oxygen diffusion of service pipes shall not exceed $0.32 \text{ mg/m}^2 d$ at 40 °C when tested in accordance with ISO 17455.

5.3 Sealing in linear direction

The manufacturer of the system shall offer components to stop leakage in the linear direction at the end of each pipe section. These components shall be water tight when tested according to water tightness test of prEN 17414-4 (without the box load test).

5.4 Water vapour permeation

The pipe supplier shall give information about the risk of the water accumulation in the insulation dependent on the service conditions.

NOTE PB, PE, PE-X, PP-R and PP-RCT pipes are slightly open for diffusion of water from the media to the insulation. The rate of diffusion increases with the temperature. The casing is likewise open for diffusion from the insulation to the soil. The rate of this diffusion depends on the casing temperature and the water vapour partial pressure difference over the casing wall. For pipes installed under the ground water table there will always be a certain build-up of water directly under the casing. Experience shows that this build up is limited and not detrimental to the function although a certain loss of insulation capacity may be expected.

6

Test procedures and ards.iteh.ai/catalog/standards/sist/4bb7a63f-792b-4f1d-97f4-

4b4b2ab67f42/sist-en-17414-3-2020 Unless stated otherwise, all tests are to be carried out:

no sooner than 72 h after production;

- at room temperature;
- on specimens taken from coiled pipes.

Guidelines for testing frequencies and responsibilities are given in prEN 17414-1:2019, Annex D.