SLOVENSKI STANDARD
SIST EN 17878-2:2024

01-maj-2024

Cevi za daljinsko ogrevanje - Tovarniško izdelani gibki cevni sistemi z nižjim temperaturnim profilom - 2. del: Vezani cevni sistemi iz polimernih materialov - Zahteve in preskusne metode

District heating pipes - Factory made flexible pipe systems with a lower temperature profile - Part 2: Bonded system with plastic service pipes; requirements and test methods

Fernwärmerohre - Flexible Rohrsysteme mit einem niedrigeren Temperaturprofil - Teil 2: Verbundrohrsysteme mit Mediumrohren aus Kunststoff; Anforderungen und Prüfungen

Tuyaux de chauffage urbain - Système de tuyaux flexibles préisolés - Partie 2 : Système bloqué avec tubes de service en plastique, exigences et méthodes d'essai

Ta slovenski standard je istoveten z: **EN 17878-2:2024**

ICS:

23.040.07	Cevovodi za daljinsko ogrevanje in njihovi deli	Pipeline and its parts for district heat
23.040.20	Cevi iz polimernih materialov	Plastics pipes

SIST EN 17878-2:2024 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 17878-2

March 2024

ICS 23.040.07

English Version

District heating pipes - Factory made flexible pipe systems with a lower temperature profile - Part 2: Requirements and test methods for bonded systems with plastic service pipes

Tuyaux de chauffage urbain - Système de tuyaux flexibles préisolés - Partie 2 : Exigences et méthodes d'essai pour les systèmes bloqués avec tubes de service en plastique

Fernwärmerohre - Flexible Rohrsysteme mit einem niedrigeren Temperaturprofil - Teil 2: Verbundrohrsysteme mit Mediumrohren aus Kunststoff - Anforderungen und Prüfungen

This European Standard was approved by CEN on 28 December 2023.

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

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European foreword

This document (EN 17878-2:2024) has been prepared by Technical Committee CEN/TC 107 “District heating and cooling 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 September 2024, and conflicting national standards shall be withdrawn at the latest by September 2024.

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 is part of the EN 17878 series of standards *District heating pipes — Factory made flexible pipe systems with a lower temperature profile*:

— *Part 1: Classification, general requirements and test methods*;

— *Part 2: Requirements and test methods for bonded systems with plastic service pipes*;

— *Part 3: Requirements and test methods for non bonded systems with plastic service pipe*s.

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, Türkiye and the United Kingdom.

Introduction

District heating technology has developed rapidly since its origin and especially in recent times. Today, there are different generations of district heating networks. The technologies of these generations are driven by the different heat sources and operating temperatures used.

CEN/TC 107 provides a set of European standard series for rigid and flexible piping systems in district heating to suit all generations and requirements of district heating networks in the market.

The standard documents ensure quality for factory made piping systems in district heating.

This standard series covers flexible, factory made piping systems for operation conditions as described in the scope of part 1.

1 Scope

This document specifies requirements and test methods for flexible, factory made, buried district heating pipe systems with plastic service pipes and bonding between the layers of the pipe assemblies.

It is only applicable in conjunction with EN 17878-1.

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 heating installations.

This document is applicable to a maximum operating temperature of 80 °C and maximum operating design pressure up to 1,0 MPa for a design service life of at least 50 years.

This document does not apply to cover surveillance systems.

NOTE For higher temperatures or for the transport of other fluids, for example potable water, additional requirements and testing are needed. Such requirements are not specified in this document.

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 485-2, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 2: Mechanical properties*

EN 573-3, *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Part 3: Chemical composition and form of products*

EN 10025-2, *Hot rolled products of structural steels — Part 2: Technical delivery conditions for non-alloy structural steels*

EN 10025-3, *Hot rolled products of structural steels — Part 3: Technical delivery conditions for normalized/normalized rolled weldable fine grain structural steels*

EN 10025-4, *Hot rolled products of structural steels — Part 4: Technical delivery conditions for thermomechanical rolled weldable fine grain structural steels*

EN 10216-1, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 1: Non-alloy steel tubes with specified room temperature properties*

EN 10216-2, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 2: Non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 10216-3, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 3: Alloy fine grain steel tubes*

EN 10217-1, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 1: Electric welded and submerged arc welded non-alloy steel tubes with specified room temperature properties*

EN 10217-2, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 2: Electric welded non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 10217-3, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 3: Electric welded and submerged arc welded alloy fine grain steel tubes with specified room, elevated and low temperature properties*

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

EN 17878-1, *District heating pipes — Factory made flexible pipe systems with a lower temperature profile — Part 1: Classification, general requirements and test methods*

EN ISO 15875 (all parts), *Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PE-X) (ISO 15875)*

EN ISO 15876 (all parts), *Plastics piping systems for hot and cold water installations — Polybutene (PB) (ISO 15876)*

EN ISO 21003 (all parts), *Multilayer piping systems for hot and cold water installations inside buildings (ISO 21003)*

EN ISO 22391 (all parts), *Plastics piping systems for hot and cold water installations — Polyethylene of raised temperature resistance (PE-RT) (ISO 22391)*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 17248 and EN 17878-1 apply.

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

— IEC Electropedia: available at https://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 at least 50 years when operated with the following temperature profile according to temperature range 2 (TR 2) in Table 1:

Table 1 — Temperature profile TR 2

	Temperature °C	**Duration**
Operating temperature (T_{op})	70	49 years
Maximum operating temperature (T_{max})	80	1 year
Malfunction temperature (T_{mal})	95	100 h

NOTE The temperature profile TR 2 is equal to Application class 2 according to ISO 10508.

Other temperature profiles may be applied in accordance with EN ISO 13760 (Miner's Rule). Further information is given in Annex A.

The maximum operating temperature shall not exceed 80 °C.

4.2 Design pressures

Pipe systems according to this document are designed for continuous operating pressures of 0,6 MPa, 0,8 MPa or 1,0 MPa.

Table 2 specifies the maximum SDR ratios of the service pipe required to withstand the operating pressures.

Table 2 — SDR ratios required for different design pressures

	Design Pressure		
Service pipe	**0,6 MPa**	**0,8 MPa**	**1,0 MPa**
PE-RT Type II	SDR 11	SDR 9	SDR 7,4
PE-X	SDR 11	SDR 9	SDR 7,4
PB-H	SDR 13,6 [a]	SDR 13,6	SDR 11
Multilayer M-pipes	The construction shall meet the design pressure 0,6 MPa, 0,8 MPa or 1,0 MPa, as applicable, when tested according to EN ISO 21003-2.		
[a] Calculated value is SDR 17, but practical use requires SDR 13,6.			

NOTE 1 The SDR ratios in Table 2 are based on the reference lines given in EN ISO 22391-1, EN ISO 15875-1 and EN ISO 15876-1, respectively.

The following minimum safety factors for design stress shall be applied, as shown in Table 3:

Table 3 — Safety factors for design stress

Temperature	**Safety factor**	**Temperature range** °C
Operating temperature (T_{op})	1,5	≤ 70
Maximum operating temperature (T_{max})	1,3	> 70 to ≤ 80
Malfunction temperature (T_{mal})	1,0	> 80 to ≤ 95
The given temperature range defines the safety factors, which shall be applied for other temperature/time profiles than Table 1, calculated in accordance with Annex A.		

NOTE 2 These safety factors are identical with the overall service (design) coefficients given in EN ISO 22391-2, EN ISO 15875-2, EN ISO 15876-2 and EN ISO 21003-2, respectively.

NOTE 3 The column "Temperature range" of Table 3 shows the temperature ranges in which the relevant safety factors are applied. This is of particular importance for the temperature profiles of Annex A, or for further customized temperature profiles.

5 Requirements

5.1 General requirements

In addition to the general requirements specified in EN 17878-1, the following product specific requirements shall apply.

5.2 Service pipes, fittings and their connections

5.2.1 Quality of service pipes, fittings and their connections

5.2.1.1 General

Service pipes, fittings and their connections shall comply with one of the following standard series, as applicable: EN ISO 22391 series or EN ISO 15875 series or EN ISO 15876 series or EN ISO 21003 series. The respective details to comply with are as given in the material specific subclauses.

5.2.1.2 PE-RT Type II

Service pipes made of polyethylene raised temperature resistance (PE-RT Type II) shall comply with EN ISO 22391-1, EN ISO 22391-2, EN ISO 22391-3 and EN ISO 22391-5.

The EN ISO 22391 series of standards consisting of part 1, 2, 3 and 5 is a piping system standard. EN ISO 22391-1 is of general importance. Pipes conforming to EN ISO 22391-2 are intended to be joined with fittings conforming to EN ISO 22391-3, whereby the connection conforms to the requirements of EN ISO 22391-5. For PE-RT Type II, the EN 17878 series shall only be used in conjunction with all these parts of EN ISO 22391.

NOTE 1 The test results obtained from a specific piping system test according EN ISO 22391-5 cannot be transferred to other combinations of pipes and fittings.

NOTE 2 Butt fusion as jointing method is not covered.

All requirements of the pipe and fitting according to EN ISO 22391-2 and EN ISO 22391-3 shall be met before leaving the production site.

Deviating from EN ISO 22391-2, the service pipe shall be a PE-RT Type II pipe.

5.2.1.3 PE-X

Service pipes made of crosslinked polyethylene (PE-X) shall comply with EN ISO 15875-1, EN ISO 15875-2, EN ISO 15875-3 and EN ISO 15875-5.

The EN ISO 15875 series of standards consisting of part 1, 2, 3 and 5 is a piping system standard. EN ISO 15875-1 is of general importance. Pipes conforming to EN ISO 15875-2 are intended to be joined with fittings conforming to EN ISO 15875-3, whereby the connection conforms to the requirements of EN ISO 15875-5. For PE-X, the EN 17878 series shall only be used in conjunction with all these parts of EN ISO 15875.

NOTE 1 The test results obtained from a specific piping system test according EN ISO 15875-5 cannot be transferred to other combinations of pipes and fittings.

NOTE 2 Butt fusion as jointing method is not covered.

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

5.2.1.4 PB-H

Service pipes made of polybutene (PB-H) shall comply with EN ISO 15876-1, EN ISO 15876-2, EN ISO 15876-3 and EN ISO 15876-5.

The EN ISO 15876 series of standards consisting of part 1, 2, 3 and 5 is a piping system standard. EN ISO 15876-1 is of general importance. Pipes conforming to EN ISO 15876-2 are intended to be joined with fittings conforming to EN ISO 15876-3, whereby the connection conforms to the requirements of EN ISO 15876-5. For PB-H, the EN 17878 series shall only be used in conjunction with all these parts of EN ISO 15876.