SLOVENSKI STANDARD
SIST EN 15632-2:2010+A1:2015

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Cevi za daljinsko ogrevanje - Izolirani gibki cevni sistemi - 2. del: Vezani cevni sistemi iz polimernih materialov - Zahteve in preskusne metode

District heating pipes - Pre-insulated flexible pipe systems - Part 2: Bonded plastic service pipes - Requirements and test methods

Fernwärmerohre - Werkmäßig gedämmte flexible Rohrsysteme - Teil 2: Verbundsysteme mit Mediumrohren aus Kunststoff - Anforderungen und Prüfungen

Tuyaux de chauffage urbain - Systèmes de tuyaux flexibles préisolés - Partie 2: Système bloqué avec tube de service en plastique - Prescriptions et méthodes d'essai

Ta slovenski standard je istoveten z: **EN 15632-2:2010+A1:2014**

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English Version

District heating pipes - Pre-insulated flexible pipe systems - Part 2: Bonded plastic service pipes - Requirements and test methods

Tuyaux de chauffage urbain - Systèmes de tuyaux flexibles préisolés - Partie 2: Système bloqué avec tube de service en plastique - Prescriptions et méthodes d'essai

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 15632-2:2010+A1:2014) has been prepared by Technical Committee CEN/TC 107 “Prefabricated district heating pipe 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of an identical text or by endorsement, at the latest by June 2015, and conflicting national standards shall be withdrawn at the latest by June 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 15632-2:2010.

This document includes Amendment 1 approved by CEN on 2014-11-08.

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

This document is one of a series of standards which form several parts of EN 15632, *District heating pipes — Pre-insulated 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*;

Part 4: *Bonded system with metal service pipes; requirements and test methods.*

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Pre-insulated flexible bonded pipe systems with plastic service pipes are used in district and local heating networks.

This part of the series of standards for the various types of flexible pipe systems is intended to be used in connection with EN 15632-1 which specifies the basic design criteria for flexible district heating pipes.

1 Scope

This European Standard provides requirements and test methods for flexible, pre-insulated, directly buried heating pipes with plastics service pipes and bonding between the layers of the pipes.

This European Standard is valid for maximum operating temperatures of 95 °C and maximum operating pressures up to 10 bar for a design lifetime of at least 30 years.

This European Standard does not cover surveillance systems.

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

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.

〉A1〈 EN 15632-1:2009+A1:2014 〉A1〈, *District heating pipes — Pre-insulated flexible pipe systems — Part 1: Classification, general requirements and test methods*

EN ISO 15875-1, *Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PE-X) — Part 1: General (ISO 15875-1:2003)*

EN ISO 15875-2:2003, *Plastics piping systems for hot and cold water installations —- Crosslinked polyethylene (PE-X) — Part 2: Pipes (ISO 15875-2:2003)*

EN ISO 15875-3, *Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PE-X) — Part 3: Fittings (ISO 15875-3:2003)*

EN ISO 15875-5:2003, *Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PE-X) — Part 5: Fitness for purpose of the system (ISO 15875-5:2003)*

EN ISO 15876-1, *Plastics piping systems for hot and cold water installations — Polybutylene (PB) — Part 1: General (ISO 15876-1:2003)*

EN ISO 15876-2, *Plastics piping systems for hot and cold water installations — Polybutylene (PB) — Part 2: Pipes (ISO 15876-2:2003)*

EN ISO 15876-3, *Plastics piping systems for hot and cold water installations — Polybutylene (PB) — Part 3: Fittings (ISO 15876-3:2003)*

EN ISO 15876-5, *Plastics piping systems for hot and cold water installations — Polybutylene (PB) — Part 5: Fitness for purpose of the system (ISO 15876-5:2003)*

EN ISO 21003-2, *Multilayer piping systems for hot and cold water installations inside buildings — Part 2: Pipes (ISO 21003-2:2008)*

ISO 10147, *Pipes and fittings made of crosslinked polyethylene (PE-X) — Estimation of the degree of crosslinking by determination of the gel content*

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 [A1] EN 15632-1:2009+A1:2014 [A1] shall apply.

4 Classification

4.1 Operating temperatures and service life

Pipe systems according to this European Standard are designed for a service life of at least 30 years when operated with the following temperature profile:

29 years at 80 °C + 1 year at 90 °C + 100 h at 95 °C.

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

The maximum operating temperature shall not exceed 95 °C.

4.2 Operating pressures

Pipe systems according to this European Standard are designed for continuous operating pressures of 6 bar, 8 bar or 10 bar.

Table 1 defines the maximum SDR ratios of the service pipe required to withstand the operating pressures.

Table 1 — SDR ratios required for different operating pressures

	Operating Pressure		
Service pipe	6 bar	8 bar	10 bar
PE-X	SDR 11	SDR 9	SDR 7,4
PB	SDR 13,6	SDR 11	SDR 9
Multilayer pipes	Wall thicknesses shall be calculated according to the methods defined in EN ISO 21003-2		

The SDR ratios in Table 1 are based on the regression curves of EN ISO 15875-1 and EN ISO 15876-1. Higher SDR ratios may be applied, if they are based on regression curves developed in accordance with EN ISO 9080.

5 Requirements

5.1 General requirements

In addition to the general requirements defined in EN 15632-1 the following product specific requirements apply.

5.2 Service pipes and fittings

5.2.1 Quality

Service pipes and fittings shall comply with:

— EN ISO 15875-1, EN ISO 15875-2, EN ISO 15875-3, EN ISO 15875-5, for pipes made of crosslinked polyethylene (PE-X), ⟨A1⟩ additionally the pipes shall not fail when tested for 15 000 h at 110 °C and at a hoop stress of 2,4 N/mm^2.

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. ⟨A1⟩

— EN ISO 15876-1, EN ISO 15876-2, EN ISO 15876-3, EN ISO 15876-5, for pipes made of polybutylene (PB), ⟨A1⟩ additionally the pipes shall not fail when tested for 15 000 h at 110 °C and at a hoop stress of 2,2 N/mm^2. ⟨A1⟩

— EN ISO 21003-2 for multi-layer pipes.

Deviating from these standards, temperature cycle tests on service pipes and fittings shall be carried out with test cycle numbers specified in 6.2.

5.2.2 Oxygen tightness

The oxygen diffusion of service pipes shall not exceed ⟨A1⟩ 1,8 mg/m²d ⟨A1⟩ at 80 °C when tested according to ISO 17455.

⟨A1⟩ *deleted text* ⟨A1⟩

5.3 Axial shear strength

The axial shear strength between the service pipe and the insulation shall be at least 0,09 MPa for plastics pipes and 0,12 MPa for multi-layer pipes, when tested in accordance with 6.3. The test result shall be determined as an average of five measurements.

5.4 Linear water tightness

When tested in accordance with 6.4, the amount of water leaking through any of the pipe ends shall not exceed 100 g after 168 h.

5.5 Water vapour permeation

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

NOTE PEX and PB 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