
Cevi za daljinsko ogrevanje - Izolirani vezani dvocevni sistemi za podzemeljska toplovodna omrežja - 1. del: Dvocevni sestav iz jeklene cevi, poliuretanske toplotne izolacije in zunanjega polietilenskega plašča

District heating pipes - Preinsulated bonded twin pipe systems for directly buried hot water networks - Part 1: Twin pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene

Fernwärmerohre - Werkmäßig gedämmte Verbundmanteldoppelrohre für direkt erdverlegte Fernwärmenetze - Teil 1: Verbund-Doppelrohrsystem bestehend aus zwei Stahl-Mediumrohren, Polyurethan-Wärmedämmung und einem Außenmantel aus Polyethylen

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Tuyaux de chauffage urbain - Systèmes bloqués de bitubes préisolés pour les réseaux d'eau chaude enterrés directement - Partie 1: Assemblage de bitubes pour tube de service en acier, isolation thermique en polyuréthane et tube de protection en polyéthylène

Ta slovenski standard je istoveten z: EN 15698-1:2009

ICS:

23.040.10	Železne in jeklene cevi	Iron and steel pipes
91.140.10	Sistemi centralnega ogrevanja	Central heating systems

SIST EN 15698-1:2009**en,fr**

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 15698-1

January 2009

ICS 23.040.10

English Version

**District heating pipes - Preinsulated bonded twin pipe systems
for directly buried hot water networks - Part 1: Twin pipe
assembly of steel service pipe, polyurethane thermal insulation
and outer casing of polyethylene**

Tuyaux de chauffage urbain - Systèmes bloqués de bitubes
préisolés pour les réseaux d'eau chaude enterrés
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tube de protection en polyéthylène

Fernwärmerohre - Werkmäßig gedämmte
Verbundmanteldoppelrohre für direkt erdverlegte
Fernwärmenetze - Teil 1: Verbund-Doppelrohrsystem
bestehend aus zwei Stahl-Mediumrohren, Polyurethan-
Wärmedämmung und einem Außenmantel aus Polyethylen

This European Standard was approved by CEN on 5 December 2008.

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Foreword

This document (EN 15698-1:2009) 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 July 2009, and conflicting national standards shall be withdrawn at the latest by July 2009.

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Introduction

This specification is part of the standards for bonded systems using polyurethane foam thermal insulation applied to bond to two steel service pipes and a polyethylene casing.

This standard has been elaborated as a complement to the standards for bonded systems using polyurethane foam thermal insulation applied to bond to one steel service pipe and a polyethylene casing.

These standards are:

EN 253, *District heating pipes – Preinsulated bonded pipe systems for directly buried hot water networks – Pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene;*

EN 448, *District heating pipes – Preinsulated bonded pipe systems for directly buried hot water networks – Fitting assemblies of steel service pipes, polyurethane thermal insulation and outer casing of polyethylene;*

EN 488, *District heating pipes – Preinsulated bonded pipe systems for directly buried hot water networks – Steel valve assembly for steel service pipes, polyurethane thermal insulation and outer casing of polyethylene;*

EN 489, *District heating pipes – Preinsulated bonded pipe systems for directly buried hot water networks – Joint assembly for steel service pipes, polyurethane thermal insulation and outer casing of polyethylene;*

EN 13941, *Design and installation of preinsulated bonded pipe systems for district heating;*

EN 14419, *District heating pipes – Preinsulated bonded pipe systems for directly buried hot water networks – Surveillance systems.*

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

1 Scope

This European Standard for District Heating Twin Pipes, specifies requirements and test methods for straight lengths of prefabricated thermally insulated pipe-in-pipe assemblies for directly buried hot water networks, comprising two steel service pipes from DN 15 to DN 250, rigid polyurethane foam insulation and one cylindrical outer casing of polyethylene. The pipe assembly may also include the following additional elements: Measuring wires, spacers and diffusion barriers.

This standard applies only to insulated twin pipe assemblies, for continuous operation with hot water at various temperatures up to 120 °C and occasionally with a peak temperature up to 140 °C.

The estimation of expected thermal life with continuous operation at various temperatures is outlined in Annex B of EN 253.

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 253:2009, *District heating pipes – Preinsulated bonded pipe systems for directly buried hot water networks – Pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene*

EN ISO 3126, *Plastics piping systems - Plastics components - Determination of dimensions (ISO 3126:2005)*

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3 Terms and definitions

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For the purposes of this document, the terms and definitions given in EN 253:2009 and the following apply.

3.1

single pipe assembly

technical solution of district heating pipes with one steel service pipe in one casing

3.2

twin pipe assembly

technical solution of district heating pipes with two steel service pipes in one casing

3.3

twisting of service pipes

tendency of the service pipes of a twin pipe assembly to twist around each other

4 Requirements

4.1 General

Unless otherwise specified, the requirements shall be valid for each single measurement.

For information on suitable guidelines for inspection of manufactured preinsulated twin pipes see Annex A.

4.2 Steel service pipe

Material, dimensions, tolerances and surface condition of the steel service pipes shall be as specified in EN 253.

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4.3 Material, casing properties and dimensions

Material and casing properties shall be as specified in EN 253.

For the casing diameters specified in Table 1 the dimensions of the casing shall be as specified in EN 253.

The maximum out-of-roundness shall conform to Table 1 and be measured in accordance with EN ISO 3126.

Table 1 — Casing diameters

Nominal diameter of service pipes DN	Casing diameter, insulation series 1 $D_{C \text{ min}}$ mm	Casing diameter, insulation series 2 $D_{C \text{ min}}$ mm	Casing diameter, insulation series 3 $D_{C \text{ min}}$ mm	Maximum out- of-roundness mm
15	125	140	160	1,2
20	125	140	160	1,2
25	140	160	180	1,2
32	160	180	200	1,3
40	160	180	200	1,4
50	200	225	250	1,4
65	225	250	280	1,5
80	250	280	315	1,6
100	315	355	400	2,0
125	400	450	500	2,5
150	450	500	560	3,0
200	560	630	710	4,0
250	710	800	900	5,0

4.4 Polyurethane rigid foam insulation (PUR)

Material and insulation properties shall be as specified in EN 253.

4.5 Pipe assembly

4.5.1 End alignment of forward and return service pipes

The alignment of the ends of the forward and return service pipes shall not differ more than 1 mm when measured in the longitudinal direction.

4.5.2 Distance between forward and return service pipes

The distance between forward and return service pipes shall be in accordance with Table 2.

The tolerance of the distance between the forward and return service pipes, L_p , is ± 1 mm when measured in the pipe ends and ± 2 mm when measured at any point inside the twin pipe assembly, see Figure 1.

Table 2 — Distance between service pipes

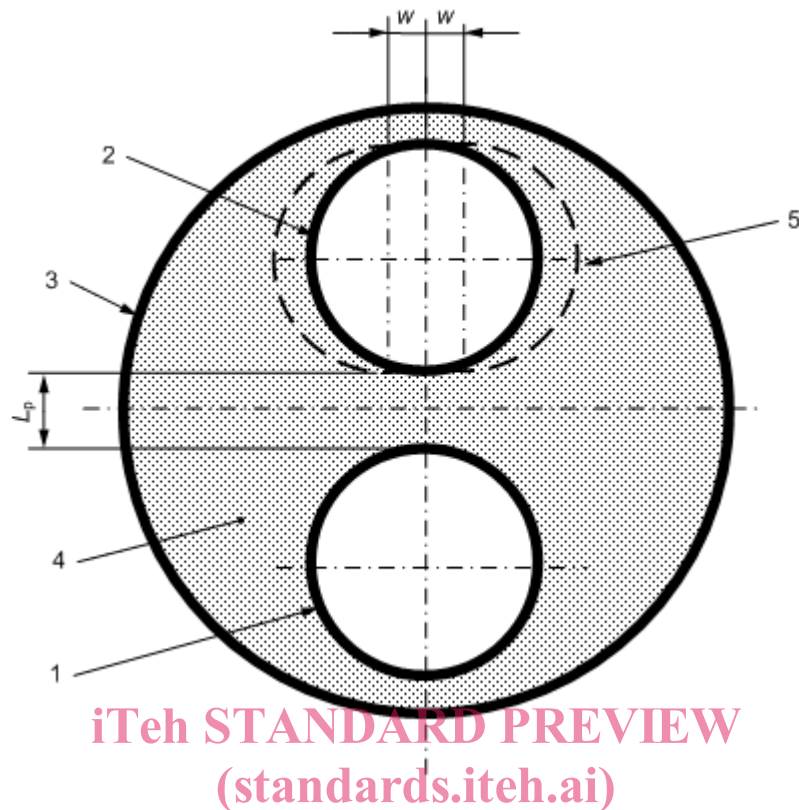
Nominal diameter of service pipes DN	Distance between service pipes L_p mm
15	19
20	19
25	19
32	19
40	19
50	20
65	20
80	25
100	25
125	30
150	40
200	45
250	45

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4.5.3 Twisting of service pipes

The twisting, w , of the service pipes in one end of the twin pipe assembly in relation to the other end shall be maximum 3 mm. The twisting, w , of the service pipes in any end of the pipe assembly in relation to any point inside the pipe assembly shall be maximum 6 mm. For cut pipes the twisting, w , shall be maximum ± 3 mm, see Figure 1.

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**Key**

- 1 forward service pipe
 2 return service pipe
 3 casing
 4 insulation
 5 service pipe at maximum twisting, w_{\max}
 L_p distance between service pipes
 w twisting

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Figure 1 — Twisting, w , and distance between service pipes, L_p **4.5.4 Centre line deviation**

The distance between the common centre line of the service pipes and the centre line of the casing at any point shall not exceed the limits given in Table 3.

Table 3 — Centre line deviation related to nominal diameters

Nominal outside diameter of casing mm	Maximum centre line deviation mm
75 to 160	3,0
180 to 400	5,0
450 to 630	8,0
710 to 800	10,0

4.5.5 Pipe ends

The pipe ends shall be in accordance with EN 253.

4.5.6 Axial shear strength

When measured in accordance with 5.5.1.4 and 5.5.1.5 the axial shear strength on each service pipe shall fulfil the requirement in EN 253.

4.5.7 Expected thermal life and long term temperature resistance

When tested in accordance with 5.5.2 the expected thermal life and long term temperature resistance shall be in accordance with EN 253.

4.5.8 Thermal conductivity in unaged condition

When tested in accordance with 5.5.3 the thermal conductivity in unaged condition shall be in accordance with EN 253. The thermal conductivity in unaged condition shall be used to calculate the thermal transmittance as described in 5.5.4.

4.5.9 Impact resistance

When determined in accordance with 5.5.5 the impact resistance shall be in accordance with EN 253.

4.5.10 Long term creep resistance and modulus

When tested in accordance with 5.5.6 the creep behaviour shall be in accordance with EN 253.

4.5.11 Surface conditions at delivery

The surface conditions at delivery shall be in accordance with EN 253.

4.5.12 Measuring wires for surveillance systems

Measuring wires, if any, shall comply with the requirements of EN 14419.

5 Test methods

5.1 General

Where test requirements specified in this standard differ from those in other standards referred to, the requirements laid down in this European Standard shall apply.

All test specimens shall be representative for the production.

5.2 Test specimens

Test specimens shall be taken in accordance with EN 253 except for the position of test specimens for compressive strength that shall be as shown in Figure 2.