

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

The European Standard EN 489:2003 has the status of a
British Standard

ICS 23.040.60

National foreword

This British Standard is the official English language version of EN 489:2003. It supersedes BS EN 489:1995 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee RHE/9, Thermal insulating materials, to Subcommittee RHE/9/3, Insulation of underground pipelines, which has the responsibility to:

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- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 27 February 2003

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 24, an inside back cover and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

© BSI 27 February 2003

ISBN 0 580 41318 7

English version

**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**

Tuyaux de chauffage urbain - Systèmes bloqués de tuyaux
pré-isolés pour les réseaux d'eau chaude enterrés
directement - Assemblage pré-isolé pour tube de service
en acier, isolation thermique en polyuréthane et tube de
protection en polyéthylène

Fernwärmerohre - Werkmäßig gedämmte
Verbundmantelrohrsysteme für direkt erdverlegte
Fernwärmenetze - Rohrverbindungen für
Stahlmediumrohre mit Polyurethan-Wärmedämmung und
Außenmantel aus Polyethylen

This European Standard was approved by CEN on 28 November 2002.

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Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 489:2003) 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 August 2003, and conflicting national standards shall be withdrawn at the latest by August 2003.

This document will supersede EN 489:1994.

Annex A is normative. Annexes B and C are informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

The first edition of EN 489 was approved in 1994. The main areas of the revision are the following:

- ¾ the title has been amended by "District heating pipes";
- ¾ the term "underground" has been changed to "directly buried";
- ¾ definitions for "polyethylene weld" and "double sealing" have been added;
- ¾ the requirements for the qualification of work force have been changed and annex C has been added;
- ¾ requirements concerning double sealing have been added;
- ¾ the water content of the sand used in the sand box has been limited to maximum 0,5 % (mass fraction).
- ¾ the former annex C "Assumptions made to establish functional requirements of joints" and all references to it have been deleted and substituted by a reference to EN 13941.

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

For information on the minimum expected thermal life with operation at various temperatures with respect to PUR foam performance see EN 253:2003, annex B.

The other standards from TC 107 are:

EN 253:2003, *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 448:2003, *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 488:2003, *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 13941:2003, *Design and installation of preinsulated bonded pipe systems for district heating.*

NOTE The following draft in connection with the above mentioned is under development:

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

As information to the users of this standard CEN/TC 107 has decided to mention that at the time of publication of this European Standard CEN/TC 107 had already concluded on the investigation and further preparation of the following topics:

- ¾ appropriate short and long term type tests for all jointing systems;
- ¾ incorporation of the findings of running research activities to introduce new test procedures and requirements;
- ¾ establishment of normative references for PE welding;
- ¾ further preparation of annex C aiming at making this annex normative.

The above mentioned items should be dealt with and the intention is to include the results in the next revision of this standard.

1 Scope

This European Standard specifies requirements for joints, made under field conditions, between adjacent preinsulated pipes and/or fittings in district heating networks. The specified general requirements are also valid for field made T-branches, bends, reducers, caps, etc.

The standard covers jointing of steel service pipes by means of fusion welding, the connecting of casing ends with joint casings and the thermal insulation with poured rigid PUR foam.

This standard specifies methods for type tests of complete joints and PUR-foam for joints under laboratory conditions. The type tests apply only to straight casing joints which are not-welded.

The requirements of this standard can also be applied to casing pipe weldings/connections of on site made fittings.

The requirements of this standard are aiming at obtaining a technical life of the joints of at least 30 years.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 253:2003, *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 287-1, *Approval testing of welders – Fusion welding – Part 1: Steels.*

EN 288-1:1992, *Specification and qualification of welding procedures for metallic materials – Part 1: General rules for fusion welding.*

EN 444, *Non-destructive testing – General principles for radiographic examination of metallic materials by X- and gamma-rays.*

EN 583-1, *Non-destructive testing – Ultrasonic examination – Part 1: General principles.*

EN 1435, *Non-destructive examination of welds – Radiographic examination of welded joints.*

EN 1712, *Non-destructive examination of welds – Ultrasonic examination of welded joints – Acceptance levels.*

EN 1714, *Non-destructive examination of welds – Ultrasonic examination of welded joints.*

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

EN 25817:1992, *Arc-welded joints in steel materials – Guidance on quality levels for imperfections (ISO 5817:1992).*

ISO 6520, *Welding and allied processes – Classification of geometric imperfections in metallic materials.*

ISO 9692, *Metal-arc welding with covered electrode, gas-shielded metal-arc welding and gas welding – Joint preparations for steel.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 253:2003 together with the following apply.

3.1

joint

complete construction of the connection between adjacent pipes and/or fittings

3.2

joint casing

part that connects the two pipe casing ends in a joint

3.3

steel weld

connection between the steel service pipes by welding

3.4

polyethylene weld

molecular jointing of polyethylene to polyethylene under influence of heat, pressure and time

3.5

double sealing

two sealing systems independently installed on the same joint, not influencing each other negatively and thus independently functioning during the service life of the joint

3.6

surveillance system

system that consists of measuring sections and measuring instruments for surveillance of pipe systems

4 Requirements

4.1 General requirements

NOTE The assumptions of EN 13941 have been taken as the base for these requirements.

4.1.1 General requirements for the joint

The joint shall be:

- ¾ watertight;
- ¾ able to withstand axial forces initiated by axial movements of the pipe in the ground;
- ¾ able to withstand radial forces and bending moments;
- ¾ able to withstand effects of temperature and temperature variations.

In case of double sealing each one of the sealing systems and the combination of both systems shall fulfil the requirements of the type test as described in clause 5.

4.1.2 Construction of the joint

Each individual step in the construction of a joint shall follow the system supplier's installation instructions in order to ensure that the joint obtained is equivalent to the joint as previously type-tested.