

**SLOVENSKI  
STANDARD**

**SIST EN ISO 15876-3:2004**

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

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ICS 23.040.45; 91.140.60

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ICS 23.040.45; 91.140.60

English version

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

Systèmes de canalisations en plastique pour les  
installations d'eau chaude et froide - Polybutène (PB) -  
Partie 3: Raccords (ISO 15876-3:2003)

Kunststoff-Rohrleitungssysteme für die Warm- und  
Kaltwasserinstallation - Polybuten (PB) - Teil 3: Formstücke  
(ISO 15876-3:2003)

This European Standard was approved by CEN on 17 March 2003.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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

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

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## Foreword

This document (EN ISO 15876-3:2003) has been prepared by Technical Committee CEN/TC 155 "Plastics piping systems and ducting systems", the secretariat of which is held by NEN, in collaboration with Technical Committee ISO/TC 138 "Plastics pipes, fittings and valves for the transport of fluids".

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 2004, and conflicting national standards shall be withdrawn at the latest by December 2005.

NOTE This draft was submitted for CEN enquiry as prEN 12319-3:1995.

This standard is part of a System Standard for plastics piping systems of a particular material for a specified application. There are a number of such System Standards.

System Standards are based on the results of the work being undertaken in ISO/TC 138 "Plastics pipes, fittings and valves for the transport of fluids", which is a Technical Committee of the International Organisation for Standardization (ISO).

They are supported by separate Standards on test methods to which references are made throughout the System Standard.

The System Standards are consistent with general standards on functional requirements and recommended practices for installation.

EN ISO 15876:2003 consists of the following Parts <sup>1)</sup>, under the general title *Plastics piping systems for hot and cold water installations — Polybutylene (PB)*.

— Part 1: *General*

— Part 2: *Pipes*

— Part 3: *Fittings* (the present standard) [SIST EN ISO 15876-3:2004](https://standards.iteh.ai/catalog/standards/sist/en-iso-15876-3-2004)

— Part 5: *Fitness for purpose of the system* <https://standards.iteh.ai/catalog/standards/sist/f42d25b5-034d-4fda-9d76-ea4e0acff9af/sist-en-iso-15876-3-2004>

— Part 7 *Guidance for the assessment of conformity* (CEN ISO/TS 15876-7).

This Part of EN ISO 15876 includes a Bibliography

At the date of publication of this standard, System Standards for piping systems of other plastics materials used for the same application include the following:

EN ISO 15874, *Plastics piping systems for hot and cold water installations — Polypropylene (PP)*

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

EN ISO 15877, *Plastics piping systems for hot and cold water installations — Chlorinated poly(vinyl chloride)(PVC-C)*

For pipes and fittings which have conformed to the relevant national standard before 1<sup>st</sup> November, 2003, as shown by the manufacturer or by a certification body, the national standard may continue to apply until 30<sup>th</sup> November 2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to 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.

<sup>1)</sup> This System Standard does not incorporate a Part 4 *Ancillary equipment* or a Part 6 *Guidance for installation*. For ancillary equipment separate standards can apply. Guidance on installation of plastics piping systems made from different materials intended to be used for hot and cold water installations is given by ENV 12108 [1].

## Introduction

The System Standard of which this is Part 3, specifies the requirements for a piping system when made from polypropylene (PB). The piping system is intended to be used for hot and cold water installations.

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this standard:

- This standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA;
- It should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

Requirements and test methods for materials and components, other than fittings, are specified in Part 1 and Part 2 of EN ISO 15876:2003. Characteristics for fitness for purpose (mainly for joints) are covered in Part 5. Part 7 (CEN ISO/TS 15876-7) gives guidance for the assessment of conformity.

This Part of EN ISO 15876 specifies the characteristics of the fittings.

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## 1 Scope

This Part of EN ISO 15876: specifies the characteristics of fittings for polypropylene (PB) piping systems intended to be used for hot and cold water installations within buildings for the conveyance of water, whether or not intended for human consumption (domestic systems) and for heating systems under design pressures and temperatures according to the class of application (see Table 1 of EN ISO 15876-1:2003).

This standard covers a range of service conditions (application classes) and design pressure classes. For values of  $T_D$ ,  $T_{max}$  and  $T_{maI}$  in excess of those in Table 1 of Part 1, this standard does not apply.

**NOTE** It is the responsibility of the purchaser or specifier to make the appropriate selections from these aspects, taking into account their particular requirements and any relevant national regulations and installation practices or codes.

It also specifies the parameters for the test methods referred to in this standard.

In conjunction with the other parts of EN ISO 15876 (see Foreword) it is applicable to fittings made from PB and to fittings made from other materials which are intended to be fitted to pipes conforming to EN ISO 15876-2:2003 for hot and cold water installations and whereby the joints conform to the requirements of EN ISO 15876-5.

It is also applicable to fittings made from alternative materials which when fitted to pipes conforming to Part 2, conform to the requirements of Part 5 of EN ISO 15876:2003.

This standard is applicable to fittings of the following types:

- socket fusion fittings
- electrofusion fittings
- mechanical fittings
- fittings with incorporated inserts

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## 2 Normative references

This 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 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 578, *Plastics piping systems — Plastics pipes and fittings — Determination of the opacity*

EN 681-1, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber*

EN 681-2, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications — Part 2: Thermoplastic elastomers*

EN 921:1994, *Plastics piping systems — Thermoplastics pipes — Determination of resistance to internal pressure at constant temperature*

EN 1254-3, *Copper and copper alloys — Plumbing fittings — Part 3: Fittings with compression ends for use with plastics pipes*

EN 10088-1, *Stainless steels — Part 1: List of stainless steels*

prEN 10226-1, *Pipe threads where pressure tight joints are made on the threads — Part 1: Taper external threads and parallel internal threads — Dimensions, tolerances and designation*

EN 12107, *Plastics piping systems — Injection-moulded thermoplastics fittings, valves and ancillary equipment — Determination of the long-term hydrostatic strength of thermoplastics materials for injection moulding of piping components*

EN ISO 3126, *Plastics piping systems — Plastics components — Determination of dimensions (ISO 3126:2003)*

## EN ISO 15876-3:2003 (E)

EN ISO 9080, *Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics materials in pipe form by extrapolation (ISO 9080:2003)*

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

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

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

ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 1133:1997, *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics*

ISO 12092, *Fittings, valves and other piping system components made of unplasticized poly(vinyl chloride) (PVC-U), chlorinated poly(vinyl chloride) (PVC-C), acrylonitrile-butadiene-styrene (ABS) and acrylonitrile-styrene-acrylester (ASA) for pipes under pressure - Resistance to internal pressure - Test method*

### 3 Terms and definitions, symbols and abbreviated terms

For the purposes of this standard, terms and definitions, symbols and abbreviations given in EN ISO 15876-1:2003 apply together with the following terms and definitions.

#### 3.1

##### fitting

component of a piping system, which connects two or more pipes and/or fittings together, without any further function

#### 3.2 Mechanical fittings

##### 3.2.1

##### compression fitting

fitting in which the joint is made by the compression of a ring or sleeve on the outside wall of the pipe with or without additional sealing elements and with internal support

##### 3.2.2

##### crimped fitting

fitting in which the joint is made by crimping of the fitting and/or a ring on the outside wall of the pipe by means of a special tool

##### 3.2.3

##### flanged fitting

fitting in which the pipe connection consists of two mating flanges which are mechanically pressed together and sealed by the compression of an elastomeric sealing element between them

##### 3.2.4

##### flat seat union fitting

fitting in which the pipe connection consists primarily of two components, at least one of which normally incorporates a flat sealing surface, which are mechanically pressed together by means of screwed nut or similar and sealed by the compression of an elastomeric sealing element between them

#### 3.3 Fittings for welding

##### 3.3.1

##### socket weld fitting

fitting in which the joint with the pipe is made by melting together the outer part of the pipe with the inner part of the fitting by means of heat induced by heated tool



**3.3.2****electrofusion fitting**

fitting in which the joint with the pipe is made by melting together the outer part of the pipe and the inner part of the fitting by means of heat induced by current flowing in an appropriate resistor inserted in the fitting body

**3.4****fitting with incorporated inserts**

fitting in which the joint is made by means of connecting threads or other outlets, inserted in the plastics body combined with fusion ends for socket welding or electrofusion

**4 Material characteristics****4.1 Plastics fitting material****4.1.1 Fitting material identical to the PB pipe compound**

The material from which fittings are made shall conform to the requirements as specified for pipes in EN ISO 15876-2:2003.

When tested in accordance with the test method as specified in Table 1 using the indicated parameters, injection moulded tubular test pieces shall withstand the hydrostatic (hoop) stress without bursting or leakage.

**Table 1 — Mechanical characteristic of tubular test pieces made of PB by injection moulding**

Characteristic	Requirement	Test parameters for the individual tests				Test method
		Hydrostatic (hoop) stress MPa	Test temp. °C	Test period h	Number of test pieces	
Resistance to internal pressure	No bursting or leakage during the test period	15,5	20	1	3	EN 921:1994 (together with EN 12107)
		6,0	95	1000	3	
		<b>Test parameters for all tests</b>				
	Sampling procedure		a			
		Type of end cap	Type a)			
		Orientation of test piece	Not specified			
		Type of test	Water-in-water			

<sup>a</sup> The sampling procedure is not specified. For guidance see CEN ISO/TS 15876-7 [2].

**4.1.2 PB Fitting material not identical to the PB pipe compound****4.1.2.1 Evaluation of  $\sigma_{LCL}$ -values and control points**

The fitting material in form of injection moulded tubular test pieces shall be evaluated by using the method given in EN ISO 9080 or equivalent where internal pressure tests are made in accordance with EN 921:1994 (together with EN 12107) to find the  $\sigma_{LCL}$ -values. The  $\sigma_{LCL}$ -values thus determined shall be used to determine the design stress,  $\sigma_{DF}$ , (see Annex A of EN ISO 15876-2:2003) and values of hydrostatic stress,  $\sigma_F$ , corresponding to the temperature and time control points given in Table 2.

NOTE 1 One equivalent way of evaluation is to calculate the  $\sigma_{LCL}$ -value for each temperature (for example 20 °C, 60 °C and 95 °C) individually.