

**Specifications for installations inside buildings  
conveying water for human consumption - Part 4:  
Installation**

This document is a preview generated by EVS

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 806-4:2010 sisaldab Euroopa standardi EN 806-4:2010 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 30.04.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 10.03.2010.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 806-4:2010 consists of the English text of the European standard EN 806-4:2010.

This standard is ratified with the order of Estonian Centre for Standardisation dated 30.04.2010 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 10.03.2010.

The standard is available from Estonian standardisation organisation.

ICS 91.140.60

### Standardite reprodutseerimis- ja levitamiseõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:  
Aru 10 Tallinn 10317 Eesti; [www.evs.ee](http://www.evs.ee); Telefon: 605 5050; E-post: [info@evs.ee](mailto:info@evs.ee)

### Right to reproduce and distribute Estonian Standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from Estonian Centre for Standardisation.

If you have any questions about standards copyright, please contact Estonian Centre for Standardisation:  
Aru str 10 Tallinn 10317 Estonia; [www.evs.ee](http://www.evs.ee); Phone: +372 605 5050; E-mail: [info@evs.ee](mailto:info@evs.ee)

ICS 91.140.60

English Version

## Specifications for installations inside buildings conveying water for human consumption - Part 4: Installation

Spécifications techniques relatives aux installations d'eau  
destinée à la consommation humaine à l'intérieur des  
bâtiments - Partie 4 : Installation

Technische Regeln für Trinkwasser-Installationen - Teil 4:  
Installation

This European Standard was approved by CEN on 23 January 2010.

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 CEN 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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

# Contents

Page

Foreword.....	4
<b>1</b> <b>Scope</b> .....	<b>5</b>
<b>2</b> <b>Normative references</b> .....	<b>5</b>
<b>3</b> <b>Terms and definitions</b> .....	<b>7</b>
<b>4</b> <b>Work on site</b> .....	<b>7</b>
4.1 <b>General</b> .....	<b>7</b>
4.2 <b>Handling of materials</b> .....	<b>7</b>
4.3 <b>Bending pipes</b> .....	<b>7</b>
4.4 <b>Joining of pipes</b> .....	<b>7</b>
4.4.1 <b>General</b> .....	<b>7</b>
4.4.2 <b>Pipe materials and joining methods</b> .....	<b>8</b>
4.4.3 <b>Boilers and instantaneous water heaters connection</b> .....	<b>12</b>
4.5 <b>Joining pipes to cisterns</b> .....	<b>12</b>
4.5.1 <b>General</b> .....	<b>12</b>
4.5.2 <b>Steel pipes to steel, fibre cement or glass reinforced plastics cisterns</b> .....	<b>12</b>
4.5.3 <b>Copper or plastics pipe to steel, fibre cement or glass reinforced plastics cisterns</b> .....	<b>12</b>
4.5.4 <b>Concrete cisterns</b> .....	<b>13</b>
4.5.5 <b>Thermo-plastics cisterns</b> .....	<b>13</b>
4.6 <b>Underground pipe laying</b> .....	<b>13</b>
4.7 <b>Pipework in buildings</b> .....	<b>13</b>
4.7.1 <b>Allowances for thermal movement and prevention of noise</b> .....	<b>13</b>
4.7.2 <b>Pipe fixings</b> .....	<b>14</b>
4.7.3 <b>Concealed (hidden) piping</b> .....	<b>14</b>
4.7.4 <b>Piping passing through structures</b> .....	<b>16</b>
4.7.5 <b>Clearance of structural members</b> .....	<b>16</b>
4.7.6 <b>Penetration of fire walls and floors</b> .....	<b>17</b>
4.7.7 <b>Drainage and prevention of air locks</b> .....	<b>17</b>
4.7.8 <b>Pipe positioning</b> .....	<b>17</b>
4.8 <b>Valves and taps</b> .....	<b>17</b>
4.9 <b>Identifying and recording piping locations</b> .....	<b>17</b>
4.9.1 <b>Location of pipes and valves</b> .....	<b>17</b>
4.9.2 <b>Identification of above ground piping</b> .....	<b>17</b>
4.9.3 <b>Record of installation</b> .....	<b>18</b>
4.9.4 <b>Identification of valves installed above ground</b> .....	<b>18</b>
4.10 <b>Water conditioning devices</b> .....	<b>18</b>
<b>5</b> <b>Dissimilar metals</b> .....	<b>18</b>
5.1 <b>General</b> .....	<b>18</b>
5.2 <b>Combination of pipes and fittings/valves made of different metals</b> .....	<b>18</b>
5.3 <b>Flow-direction-rule</b> .....	<b>19</b>
<b>6</b> <b>Commissioning</b> .....	<b>19</b>
6.1 <b>Filling and hydrostatic pressure testing of the installations inside buildings conveying water for human consumption</b> .....	<b>19</b>
6.1.1 <b>General</b> .....	<b>19</b>
6.1.2 <b>Steel pipes, stainless steel pipes and copper pipes (linear elastic material)</b> .....	<b>19</b>
6.1.3 <b>Plastics pipes (elastic or visco-elastic material)</b> .....	<b>20</b>
6.2 <b>Flushing the pipework</b> .....	<b>23</b>
6.2.1 <b>General procedure</b> .....	<b>23</b>
6.2.2 <b>Flushing with water</b> .....	<b>23</b>
6.2.3 <b>Flushing procedure with water/air mixture</b> .....	<b>24</b>
6.3 <b>Disinfection</b> .....	<b>25</b>

6.3.1	General.....	25
6.3.2	Selection of disinfectants .....	26
6.3.3	Methods for using disinfectants .....	26
6.3.4	Disinfection of storage cisterns and distributing pipes .....	27
6.3.5	Localised repairs .....	27
<b>Annex A (normative) Pipe system material specifications, jointing procedures and pipe installation for different types of materials.....</b>		<b>28</b>
A.1	General.....	28
A.2	Connections between different materials .....	28
A.2.1	Above-ground pipework .....	28
A.2.2	Below-ground pipework.....	28
A.3	Ductile iron .....	28
A.3.1	General.....	28
A.3.2	Types of joints .....	28
A.3.3	Jointing procedures .....	29
A.4	Stainless steel piping .....	29
A.4.1	General.....	29
A.4.2	Types of joints .....	29
A.4.3	Preparation of tube .....	30
A.4.4	Corrosion.....	31
A.5	Hot dip galvanised steel piping.....	31
A.5.1	General.....	31
A.5.2	Types of joints .....	31
A.5.3	Welded joints .....	32
A.5.4	Corrosion.....	32
A.6	Copper piping .....	32
A.6.1	General.....	32
A.6.2	Categories of joints .....	32
A.6.3	Jointing procedures .....	33
A.6.4	Bending.....	36
A.6.5	Drift expanding .....	36
A.6.6	Corrosion.....	36
A.7	Plastic piping .....	36
A.7.1	Types of joints .....	36
A.7.2	Preparation of pipe .....	37
A.7.3	Fused joints.....	37
A.7.4	Solvent cement fittings .....	38
A.7.5	Compression fittings.....	39
A.7.6	Push-fit fittings .....	40
A.7.7	Flanged fittings .....	40
<b>Annex B (informative) Calculation and compensation for thermal effects of pipes.....</b>		<b>42</b>
B.1	Thermal expansion of metal pipes.....	42
B.2	Thermal expansion of plastics pipes.....	43
B.3	Positioning of anchor points.....	44
B.4	Installation of pipes allowing expansion by means of a flexible arm .....	44
B.5	Installation of pipes allowing expansion by means of an expansion loop.....	46
B.6	Installation of pipes allowing expansion and with continuous support and guide brackets .....	47
B.7	Installation of pipes allowing expansion and with guide brackets .....	48
B.8	Installation of pipes on continuous horizontal supports .....	48
B.9	Installation of pipes not allowing expansion.....	48
B.10	Positioning of anchor points.....	49
B.11	Installation between anchor points where continuous pipe stiffening is provided (PE-X, PB, PP and PE) .....	49
B.12	Installation of pipes supported only at the anchor points (for PE-X, PB, PP and PE) .....	50
<b>Annex C (informative) Recommended maximum spacings of fixings for metal pipes .....</b>		<b>52</b>
<b>Bibliography.....</b>		<b>53</b>

## Foreword

This document (EN 806-4:2010) has been prepared by Technical Committee CEN/TC 164 "Water Supply", the secretariat of which is held by AFNOR.

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 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

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 is intended for the use of engineers, architects, surveyors, contractors, installers, water suppliers, consumers and regulatory authorities.

This standard has been written in the form of a practice specification. It is the fourth part of a European Standard consisting of five parts as follows:

- *Part 1: General*
- *Part 2: Design*
- *Part 3: Pipe sizing — Simplified method*
- *Part 4: Installation*
- *Part 5: Operation and maintenance*

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This European Standard specifies requirements and gives recommendations for the installation of potable water installations within buildings and for pipework outside buildings but within the premises in accordance with EN 806-1. This European Standard is applicable to new installations, alterations and repairs.

## 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 200, *Sanitary tapware — Single taps and combination taps for water supply systems of type 1 and type 2 — General technical specification*

EN 545:2006, *Ductile iron pipes, fittings, accessories and their joints for water pipelines — Requirements and test methods*

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

EN 751-1, *Sealing materials for metallic threaded joints in contact with 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> family gases and hot water — Part 1: Anaerobic jointing compounds*

EN 751-2, *Sealing materials for metallic threaded joints in contact with 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> family gases and hot water — Part 2: Non-hardening jointing compounds*

EN 751-3, *Sealing materials for metallic threaded joints in contact with 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> family gases and hot water — Part 3: Unsintered PTFE tapes*

EN 805, *Water supply — Requirements for systems and components outside buildings*

EN 806-1:2000, *Specifications for installations inside buildings conveying water for human consumption — Part 1: General*

EN 806-2, *Specification for installations inside buildings conveying water for human consumption — Part 2: Design*

EN 817, *Sanitary tapware — Mechanical mixing valves (PN 10) — General technical specifications*

EN 1044, *Brazing — Filler metals*

EN 1057, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1092 (all parts), *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated*

EN 1111, *Sanitary tapware — Thermostatic mixing valves (PN 10) — General technical specification*

EN 1254-1, *Copper and copper alloys — Plumbing fittings — Part 1: Fittings with ends for capillary soldering or capillary brazing to copper tubes*

EN 1254-2, *Copper and copper alloys — Plumbing fittings — Part 2: Fittings with compression ends for use with copper tubes*

EN 1254-4, *Copper and copper alloys — Plumbing fittings — Part 4: Fittings combining other end connections with capillary or compression ends*

EN 1254-5, *Copper and copper alloys — Plumbing fittings — Part 5: Fittings with short ends for capillary brazing to copper tubes*

EN 1514-1, *Flanges and their joints — Dimensions of gaskets for PN-designated flanges — Part 1: Non-metallic flat gaskets with or without inserts*

EN 1717:2000, *Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow*

EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

EN 10226 (all parts), *Pipe threads where pressure tight joints are made on the threads*

EN 10240, *Internal and/or external protective coatings for steel tubes — Specification for hot dip galvanized coatings applied in automatic plants*

EN 10242, *Threaded pipe fitting in malleable cast iron*

EN 10255, *Non-Alloy steel tubes suitable for welding and threading — Technical delivery conditions*

EN 10312, *Welded stainless steel tubes for the conveyance of aqueous liquids including water for human consumption — Technical delivery conditions*

EN 13443-1, *Water conditioning equipment inside buildings — Mechanical filters — Part 1: Particle rating 80 µm to 150 µm — Requirements for performances, safety and testing*

EN 15161, *Water conditioning equipment inside buildings — Installation, operation, maintenance and repair*

EN 29454-1:1993, *Soft soldering fluxes — Classification and requirements — Part 1: Classification, labelling and packaging (ISO 9454-1:1990)*

EN 60335-1, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60335-1:2001, modified)*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

EN ISO 4016, *Hexagon head bolts — Product grade C (ISO 4016:1999)*

EN ISO 4034:2000, *Hexagon nuts — Product grade C (ISO 4034:1999)*

EN ISO 7091, *Plain washers — Normal series — Product grade C (ISO 7091:2000)*

EN ISO 9453, *Soft solder alloys — Chemical compositions and forms (ISO 9453:2006)*

EN ISO 15874-3, *Plastics piping systems for hot and cold water installations — Polypropylene (PP) — Part 3: Fittings (ISO 15874-3:2003)*

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

EN ISO 15877-3, *Plastics piping systems for hot and cold water installations — Chlorinated poly(vinyl chloride) (PVC-C) — Part 3: Fittings (ISO 15877-3:2009)*

EN ISO 21003-3, *Multilayer piping systems for hot and cold water installations inside buildings — Part 3: Fittings (ISO 21003-3:2008)*

IEC 60449, *Voltage bands for electrical installations of buildings*

### **3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN 806-1:2000 and EN 1717:2000 apply.

## **4 Work on site**

### **4.1 General**

This Clause gives requirements and recommendations on how installation work should be carried out in order to ensure the system fulfils its requirements for long-term safe and economic use and maintain environmental sustainability.

All products shall comply with the relevant product standards and, while awaiting the adoption of verifiable European criteria, with the national regulations.

### **4.2 Handling of materials**

Pipes, fittings and other components shall be protected, handled and stored carefully to avoid damage and to prevent contamination by dirt, building materials, vermin and other extraneous matter.

Manufacturers' advice shall be followed concerning how their products should be loaded, transported, unloaded and stored.

### **4.3 Bending pipes**

Bending of a straight pipe shall be carried out by using purpose designed equipment.

When forming bends, care shall be taken to avoid rippling and throating and restricting the diameter of pipes when forming bends.

Bent pipes shall be inspected for damage before use.

Hot dipped zinc coated steel pipes over DN 50 shall not be bent (see EN 10240 and EN 10255).

### **4.4 Jointing of pipes**

#### **4.4.1 General**

All joints shall be made in accordance with the relevant standards and the manufacturer's instructions. Care shall be taken to establish satisfactory jointing techniques for all water service pipework. Pipes shall be cut at right angles to their axes. Burrs and ridges shall be removed before assembling a joint. If gouges, splits or damage to the pipe end are apparent, the end of the pipe should be re-cut to remove them. Materials used to make the joint should be prevented from entering the waterways. All pipes and fittings shall be internally clean and free from particles of sand, soil, metal filings and chips, etc.

All pipe joints shall be permanently watertight. Pipe joints shall be clad, plastered over or otherwise covered only after having been pressure tested (see 6.1), unless national regulations require accessibility of certain joints, then compliance with those national regulations shall be achieved.