

**Vattenförsörjning – Tappvattensystem för
dricksvatten –
Del 2: Utformning**

**Specification for installations inside buildings
conveying water for human consumption –
Part 2: Design**

Europastandarden EN 806-2:2005 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 806-2:2005.

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Specification for installations inside buildings conveying water for human consumption - Part 2: Design

Spécifications techniques relatives aux installations pour
l'eau destinée à la consommation humaine à l'intérieur des
bâtiments - Partie 2: Conception

Technische Regeln für Trinkwasser-Installationen - Teil 2:
Planung

This European Standard was approved by CEN on 3 February 2005.

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Foreword

This document (EN 806-2:2005) 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of an identical text or by endorsement, at the latest by September 2005, and conflicting national standards shall be withdrawn at the latest by September 2005.

This document has been prepared under the direction of CEN/TC 164 and is intended for the use of engineers, architects, surveyors, contractors, installers, water suppliers, consumers and regulatory inspections.

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

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

NOTE : Products intended for use in water supply systems must comply, when existing, with national regulations and testing arrangements that ensure fitness for contact with drinking water. The Member states relevant regulators and the EC Commission agreed on the principle of a future unique European Acceptance Scheme (EAS), which would provide a common testing and approval arrangement at European level. If and when the EAS is adopted, European Product Standards will be amended by the addition of an Annex Z/EAS under Mandate M136 which will contain formal references to the testing, certification and product marking requirements of the EAS. Until EAS comes into force, the current national regulations remain applicable.

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

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1 Scope

This document gives recommendations, and specifies requirements, on the design of potable water installations within buildings and for pipework outside buildings but within the premises (see EN 806-1) and applies 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 26, *Gas-fired instantaneous water heaters for sanitary uses production, fitted with atmospheric burners (Including Corrigendum 1998)*.

EN 89, *Gas-fired storage water heaters for the production of domestic hot water*.

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

EN 625, *Gas-fired central heating boilers — Specific requirements for the domestic hot water operation of combination boilers of nominal heat input not exceeding 70 kW*.

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

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

prEN 806-3, *Specifications for installations inside buildings conveying water for human consumption — Part 3: Pipe sizing*.

EN 973, *Chemicals used for treatment of water intended for human consumption – Sodium chloride for regeneration of ion exchangers*.

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

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

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*.

prEN 1254-7, *Copper and copper alloys - Plumbing fittings - Part 7: Fittings with press ends for metallic tubes*

EN 1452-1, *Plastics piping systems for water supply — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: General*.

EN 1452-2, *Plastics piping systems for water supply — Unplasticized poly(vinyl chloride) (PVC-U) — Part 2: Pipes*.

EN 1452-3, *Plastics piping systems for water supply — Unplasticized poly(vinyl chloride) (PVC-U) — Part 3 : Fittings.*

EN 1452-5, *Plastics piping systems for water supply — Unplasticized poly(vinyl chloride) (PVC-U) — Part 5: Fitness for purpose of the system.*

ENV 1452-7, *Plastics piping systems for water supply — Unplasticized poly(vinyl chloride) (PVC-U) — Part 7: Guidance for the assessment of conformity.*

EN 1487, *Building valves – Hydraulic safety groups – Tests and requirements.*

EN 1488, *Building valves – Expansion group – Tests and requirements.*

EN 1489, *Building valves – Pressure safety valves – Tests and requirements.*

EN 1490, *Building valves - Combined temperature and pressure relief valves - Tests and requirements.*

EN 1491, *Building valves – Expansion valve – Tests and requirements.*

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

EN 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 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 10284, *Malleable cast iron fittings with compression ends for polyethylene (PE) piping systems.*

EN 12201-1, *Plastics piping systems for water supply – Polyethylene (PE) – Part 1: General*

EN 12201-2, *Plastics piping systems for water supply – Polyethylene (PE) – Part 2: Pipes*

EN 12201-3, *Plastics piping systems for water supply – Polyethylene (PE) – Part 3: Fittings.*

EN 12201-5, *Plastics piping systems for water supply – Polyethylene (PE) – Part 5: Fitness for purpose of the system.*

CEN/TS 12201-7, *Plastics piping systems for water supply – Polyethylene (PE) – Part 7: Guidance for the assessment of conformity.*

EN 12502-1, *Protection of metallic materials against corrosion – Guidance on the assessment of corrosion likelihood in water distribution and storage systems – Part 1: General.*

EN 12502-2, *Protection of metallic materials against corrosion – Guidance on the assessment of corrosion likelihood in water distribution and storage systems – Part 2: Influencing factors for copper and copper alloys.*

EN 12502-3, *Protection of metallic materials against corrosion – Guidance on the assessment of corrosion likelihood in water distribution and storage systems – Part 3: Influencing factors for hot dip galvanised ferrous materials.*

prEN 12502-4, *Protection of metallic materials against corrosion – Guidance on the assessment of corrosion likelihood in water distribution and storage conveying systems – Part 4: Influencing factors for stainless steels.*

EN 12502-5, *Protection of metallic materials against corrosion – Guidance on the assessment of corrosion likelihood in water distribution and storage systems – Part 5: Influencing factors for cast iron, unalloyed and low alloyed steels.*

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EN 12842, *Ductile iron fittings for PVC-U or PE piping systems – Requirements and test methods.*

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 14095, *Water conditioning equipment inside buildings - Electrolytic treatment systems with aluminium anodes - Requirements for performance, safety and testing.*

EN 14525, *Ductile iron wide tolerance couplings and flange adaptors for use with pipes of different materials: ductile iron, Grey iron, Steel, PVC-U PE, Fibre – cement.*

prEN 14743, *Water equipment inside buildings - Softeners - Requirements for performance, safety and testing.*

EN 29453, *Soft solder alloys; chemical compositions and forms (ISO 9453:1990).*

EN 60335-2-21, *Household and similar electrical appliances - Safety - Part 2-21: Particular requirements for storage water heaters (IEC 60335-2-21:2002, modified).*

EN 60335-2-35, *Household and similar electrical appliances - Safety - Part 2-35: Particular requirements for instantaneous water heaters (IEC 60335-2-35:2002).*

EN 60534-8-4, *Industrial-process control valves — Part 8 : Noise considerations — Section 4: Prediction of noise generated by hydrodynamic flow (IEC 60534-8-4/1994).*

EN 60730-1, *Automatic electrical controls for household and similar use — Part 1: General requirements (IEC 60730-1:1999, modified).*

EN 60730-2-8, *Automatic electrical controls for household and similar use — Part 2-8: Particular requirements for electrically operated water valves, including mechanical requirements (IEC 60730-2-8:2000, modified).*

EN ISO 3822-1, *Acoustics - Laboratory tests on noise emission from appliances and equipment used in water supply installations - Part 1: Method of measurement (ISO 3822-1:1999).*

EN ISO 3822-2, *Acoustics - Laboratory tests on noise emission from appliances and equipment used in water supply installations - Part 2: Mounting and operating conditions for draw-off taps and mixing valves (ISO 3822-2:1995).*

EN ISO 3822-3, *Acoustics - Laboratory tests on noise emission from appliances and equipment used in water supply installations - Part 3: Mounting and operating conditions for in-line valves and appliances (ISO 3822-3:1997).*

EN ISO 3822-4, *Acoustics - Laboratory tests on noise emission from appliances and equipment used in water supply installations - Part 4: Mounting and operating conditions for special appliances (ISO 3822-4:1997).*

EN ISO 6509, *Corrosion of metals and alloys - Determination of dezincification resistance of brass (ISO 6509:1981).*

EN ISO 15874-1, *Plastics piping systems for hot and cold water installations – Polypropylene (PP) – Part 1: General (ISO 15874-1:2003).*

EN ISO 15874-2, *Plastics piping systems for hot and cold water installations – Polypropylene (PP) – Part 2: Pipes (ISO 15874-2:2003).*

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

EN ISO 15874-5, *Plastics piping systems for hot and cold water installations – Polypropylene (PP) – Part 5: Fitness for purpose of the system (ISO 15874-5:2003).*

EN ISO/TS 15874-7, *Plastics piping systems for hot and cold water installations– Polypropylene (PP) – Part 7: Guidance for the assessment of conformity (ISO/TS 15874-7:2003).*

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

EN ISO 15875-5, *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/TS 15875-7, *Plastics piping systems for hot and cold water installations – Crosslinked polyethylene (PE-X) – Part 7: Guidance for the assessment of conformity (ISO/TS 15875-7:2003)*

EN ISO 15876-1, *Plastics piping systems for hot and cold water – 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/TS 15876-7, *Plastics piping systems for hot and cold water installations – Polybutylene (PB) – Part 7: Guidance for the assessment of conformity (ISO/TS 15876-7:2003).*

EN ISO 15877-1, *Plastics piping systems for hot and cold water installations – Chlorinated poly(vinyl chloride) (PVC-C) – Part 1: General (ISO 15877-1:2003).*

EN ISO 15877-2, *Plastics piping systems for hot and cold water installations – Chlorinated poly(vinyl chloride) (PVC-C) – Part 2: Pipes (ISO 15877-2:2003).*

EN ISO 15877-3, *Plastics piping systems for hot and cold water installations – Chlorinated poly(vinyl chloride) (PVC-C) – Part 3: Fittings (ISO 15877-3:2003).*

EN ISO 15877-5, *Plastics piping systems for hot and cold water installations – Chlorinated poly(vinyl chloride) (PVC-C) – Part 5: Fitness for purpose of the system (ISO 15877-5:2003).*

EN ISO/TS 15877-7, *Plastics piping systems for hot and cold water installations – Chlorinated poly(vinyl chloride) (PVC-C) – Part 7: Guidance for the assessment of conformity (ISO/TS 15877-7:2003).*

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

IEC 60064-5-54, *Electrical installations of buildings - Part 5-54: Selection and erection of electrical equipment; Earthing arrangements, protective conductors and protective bonding conductors*

3 General requirements

3.1 Water supply

This document applies irrespective of the water being supplied by a statutory water supplier or from a private supply. Attention is drawn to national or local regulations and requirements.

3.2 Basic concepts

3.2.1 General

For design and construction of a potable water installation two types of installation are considered:

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- installation type A: Closed potable water installations, see EN 806-1:2000, 5. and Annex A, Figure 2.
- installation type B: Vented potable water installations, see EN 806-1:2000, 5.11 and Annex A, Figure 3.

Installation types A and B may be combined.

The potable water installation shall be designed to:

- a) avoid waste, undue consumption, misuse and water contamination;
- b) avoid excessive velocity, low flow rates and stagnant areas;
- c) enable water supply to all individual water outlets, taking into consideration pressure, flow rate, water temperature and use of building;
- d) avoid the trapping of air during filling and the formation of air locks during operation of the installation;
- e) not cause danger or inconvenience to persons and domestic animals nor endanger buildings or their contents;
- f) avoid damage (e.g. scaling, corrosion and degradation) and to prevent the water quality being affected by local environment;
- g) facilitate access and maintenance operations of appliances;
- h) avoid cross-connections and
- i) minimise the generation of noise.

3.2.2 Water and energy conservation

The designer shall consider the water usage and energy demands of an installation and seek to minimise these.

3.3 Underground pipework

All underground pipework covered by this standard shall conform with the requirements given in EN 805.

3.4 Materials, components and appliances

3.4.1 General

All materials, components and appliances used in the construction of potable water systems shall comply with appropriate CEN product standards or European Technical Approval guidelines if applicable. Where these are not available national standards or local regulations should be used.

The design and selection of materials shall take into consideration the service conditions and water quality.

Information and criteria about the reasonable choice of metal pipe material taking into account corrosion likelihood is given in EN 12502-1 to -5.

3.4.2 Pressure and temperature

To ensure adequate strength, all components of the system shall be designed to meet the test pressure requirements of the local and national laws and regulations. The test pressure shall be at least 1,5 times the allowable maximum operating pressure (PMA).

All pipes and joints of a potable water installation shall be designed for a service life of 50 years taking into account appropriate maintenance and specific operating conditions.

Unless otherwise specified in European Standards, the materials, components and appliances for hot drinking water installations shall be capable of resisting water temperatures up to 95° under fault conditions.

The minimum operating conditions for calculation purposes for pipes and pipe fittings shall be as given in Table 1 and Table 2.

Table 1 — Allowable maximum operating pressure classes

Allowable maximum operating pressure (PMA) class	Pressure kPa
PMA 1,0	1000
PMA 0,6	600
PMA 0,25	250

Table 2 — Classification of service conditions for plastic pipe systems

Application class	Design temperature, T_D °C	Time at T_D years	T_{max} °C	Time at T_{max} years	T_{mal} for fault condition °C	Time at T_{mal} for fault condition h	Typical field of application
1	60	49	80	1	95	100	Hot water supply (60 °C)
2	70	49	80	1	95	100	Hot water supply (70 °C)

All systems which satisfy the conditions specified in Table 2 shall also be suitable for the conveyance of cold water for a period of 50 years at a temperature of 20 °C and a design pressure of 10 bar.

If not required in national or local regulations the sum of operation pressure and surge pressure should not exceed test pressure of the installation.

Surge pressures resulting from the operation of valves in fire extinguishing and fire protection systems which are operated no more than once a month for test purposes and otherwise only in the event of a fire are excluded from this requirement.

3.5 Water flow rates

Design flow rates from outlets are given in prEN 806-3.

3.6 Operating Temperature

30 s after fully opening a draw-off fitting, the water temperature should not exceed 25 °C for cold water draw off points and should not be less than 60 °C for central hot water systems unless otherwise specified by local or national regulations.

Hot water systems should have the facility to enable the temperature at the extremities of the system to be raised to 70 °C for disinfection purposes (see 9.1).

4 Private water supplies

Where a private water supply is to be used in addition to water supplied by a statutory water supplier, the supplier's approval to the proposals shall be obtained before work commences. There shall be no cross connection of systems carrying water from different water suppliers or of different sources from one supplier. See EN 1717.