
Varovanje pitne vode pred onesnaževanjem v napeljavah za pitno vodo in splošne zahteve za varovala za preprečitev onesnaževanja pitne vode zaradi povratnega toka (vključno z dopolnilom A1)

Protection against pollution of water intended for human consumption in potable water installations and general requirements for devices to prevent pollution by backflow

Schutz des Trinkwassers vor Verunreinigungen in Trinkwasserinstallationen und allgemeine Anforderungen an Sicherungseinrichtungen zur Verhütung von Trinkwasserverunreinigungen durch Rückfließen

Protection contre la pollution de l'eau destinée à la consommation humaine dans les installations d'eau potable et exigences générales applicables aux dispositifs de protection contre la pollution par retour

Ta slovenski standard je istoveten z: EN 1717:2025+A1:2026

ICS:

13.060.20	Pitna voda	Drinking water
23.060.01	Ventili na splošno	Valves in general
91.140.60	Sistemi za oskrbo z vodo	Water supply systems

SIST EN 1717:2025+A1:2026

en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1717:2025+A1

July 2026

ICS 13.060.20; 23.060.01; 91.140.60

Supersedes EN 1717:2025

English Version

**Protection against pollution of water intended for human
consumption in potable water installations and general
requirements for devices to prevent pollution by backflow**

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Rückfließen

This European Standard was approved by CEN on 5 June 2025 and includes Amendment 1 approved by CEN on 25 March 2026.

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Ref. No. EN 1717:2025+A1:2026 E

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EN 1717:2025+A1:2026 (E)**European foreword**

This document (EN 1717:2025+A1:2026) 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of an identical text or by endorsement, at the latest by January 2027, and conflicting national standards shall be withdrawn at the latest by January 2027.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1 approved by CEN on 25 March 2026.

This document supersedes A1 EN 1717:2025 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

This document includes the following significant technical changes with respect to EN 1717:2000:

- the Scope has been made more precise, extended and revised;
- terms and definitions have been amended;
- all Figures have been updated and re-drawn;
- Table 2 has been updated;
- Clause “Air break to drain” has been revised;
- Annex A and Annex B have been completely revised;
- Annex C has been revised and provides application examples.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the products covered by this document, it provides no information as to whether the products may be used without restriction in any of the Member state of the EU or EFTA;

NOTE While awaiting the adoption of verifiable European criteria, attention is also drawn to national regulations that can apply.

The UK Matrix of the protection units appropriate to fluid categories (Table 2) and the determination of fluid categories (5.2) differs to that detailed within the body of this document. The British Standard version of EN 1717 therefore contains an A deviation to cover the limited technical deviations to ensure compliance with the Water Supply (fittings) Regulations 1999.

Annex A of this document is normative.

Annex B and Annex C of this document are informative.

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1 Scope

This document specifies an analysing methodology for protecting potable water in potable water installations within and outside buildings but within premises from the risk of pollution by backflow of non-potable water and gives recommendations on the design, risk analysis, backflow prevention devices and their installation methods (see Figure 1 and Figure 2).

This methodology is also intended to be used outside premises for all water systems connected to a potable water distribution system up to and including the point of use (see Figure 3).

The product standards for the specific backflow prevention devices or arrangements are intended to be used in conjunction with this document. For the development of new devices or systems, this document is intended to be used as a reference to establish the necessary level of backflow protection.

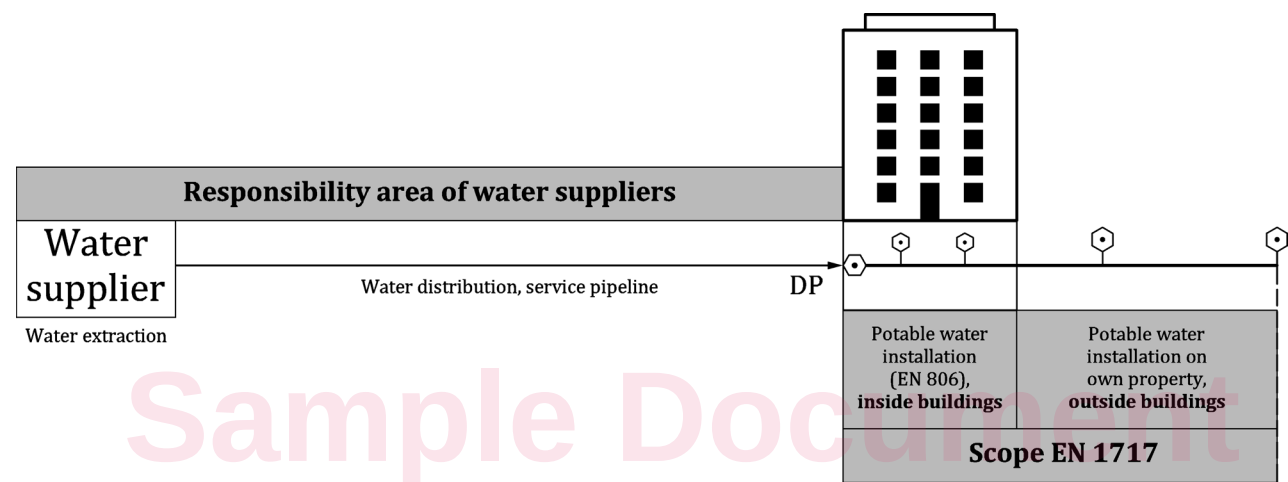


Figure 1 — Operator of a building on own property (land), delivery point (DP) in the building, EN 1717 Scope of application inside and outside buildings

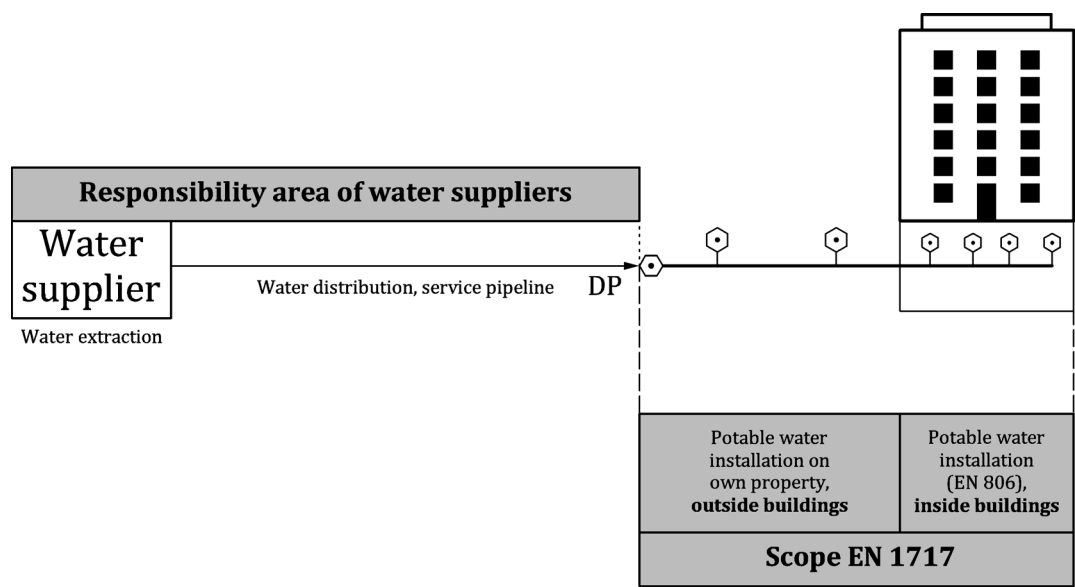


Figure 2 — Operator of a building with its own property (land), delivery point (DP) at the property boundary, EN 1717 Scope of application inside and outside buildings.

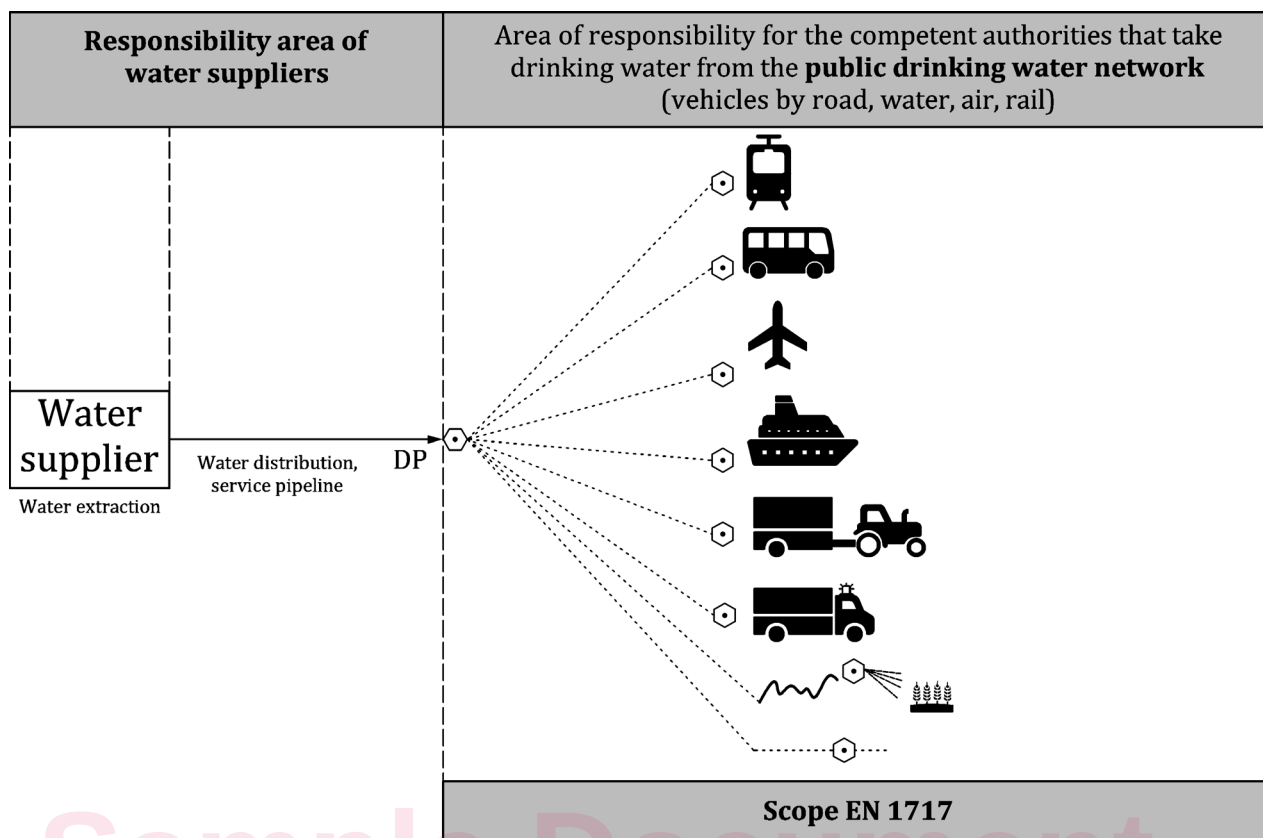


Figure 3 — Withdrawal of drinking water from a public drinking water service pipeline at the delivery point (DP) for the operation and/or filling of mobile units with containers (vehicles on road, water, air, rail), EN 1717 with scope at the transfer point in the outdoor area, supply network

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 806 (all parts), *Specifications for installations inside buildings conveying water for human consumption*

EN 12729, *Devices to prevent pollution by backflow of potable water - Controllable backflow preventer with reduced pressure zone - Family B - Type A*

EN 13076, *Devices to prevent pollution by backflow of potable water - Unrestricted air gap-Family A - Type A*

EN 13077, *Devices to prevent pollution by backflow of potable water - Air gap with non-circular overflow (unrestricted) - Family A - Type B*

EN 13078, *Devices to prevent pollution by backflow of potable water - Air gap with submerged feed incorporating air inlet plus overflow - Family A, type C*

EN 13079, *Devices to prevent pollution by backflow of potable water - Air gap with injector - Family A - Type D*

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EN 13433, *Devices to prevent pollution by backflow of potable water - Mechanical disconnecter, direct actuated - Family G, type A*

EN 13959, *Anti-pollution check valves - DN 6 to DN 250 inclusive family E, type A, B, C and D*

EN 14367, *Non controllable backflow preventer with different pressure zones - Family C, type A*

EN 14451, *Devices to prevent pollution by backflow of potable water - In-line anti-vacuum valves DN 10 to DN 50 inclusive - Family D, type A*

EN 14452, *Devices to prevent pollution by backflow of potable water - Pipe interrupter with atmospheric vent and moving element DN 10 to DN 20 - Family D, type B*

EN 14453, *Devices to prevent pollution by backflow of potable water - Pipe interrupter with permanent atmospheric vent DN 10 to DN 20 - Family D, type C*

EN 14622, *Devices to prevent pollution by backflow of potable water - Air gap with circular overflow (restricted) - Family A, type F*

EN 14623, *Devices to prevent pollution by backflow of potable water - Air gaps with minimum circular overflow (verified by test or measurement) - Family A, type G*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in the EN 806 series and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp/>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

air break to drain

vertical distance realised by air inlets or full disconnection between the lowest point of the outlet and the spillover level of the atmospheric drain overflow

3.2

air gap

permanent atmospheric separation between the upstream fluid supply and the downstream fluid

3.3

air inlet

orifice designed to admit air from the atmosphere into a hydraulic system

3.4

appliance

equipment

device in which the potable water is used and/or is modified

Note 1 to entry: e.g. water heater, coffee-machine, WC-pan, etc.

3.5**backflow**

movement of the fluid from downstream to upstream within an installation

3.6**backflow protection device**

device which is intended to prevent pollution of potable water by backflow

3.7**different liquid levels****3.7.1****critical level**

physical or piezometric level of the fluid reached in any part of the appliance after closing the water inlet, starting from maximum level

3.7.2**maximum level**

highest fluid level reached above the spillover level under positive pressure fault conditions with all outlets closed but with the overflow open

3.7.3**spillover level**

level at which water will start to overflow the receiving vessel with all outlets closed

3.8**disconnection**

break in a hydraulic system creating an atmospheric separation between two elements, one carrying or containing potable water (upstream) and another carrying or containing another fluid (downstream)

3.8.1**controllable disconnection**

device having the ability through the provision of test ports to verify the performance parameters of a pressure controlled zone – such as the differential pressure

3.8.2**non-controllable disconnection**

device which has no provision of test ports or other means to verify performance parameters of pressure controlled zones

3.9**domestic use**

intended use of applications and appliances that are common for a potable water installation in a household environment

Note 1 to entry: The same use of these appliances and applications in e.g. flats, hotels, schools, offices and collective residences (student and nurse accommodations or similar) is considered to be domestic use (see also 6.2)

3.10**downstream**

side to which fluid flows under normal conditions

EN 1717:2025+A1:2026 (E)**3.11****family of protection**

general identification of a backflow protection device principle

3.12**fluid**

liquid that can assume the shape of any container or vessel, and they are relatively incompressible

Note 1 to entry: Fluids are divided into liquids and gases.

3.13**LD₅₀**

calculated value, based on OECD 423 test method, of the quantities of substances or mixture which, given on one intake through oral and parental path, bring about within 15 days (the required time to consider potential delayed effects) the death of 50 out of 100 treated animals

Note 1 to entry: It should be realized that the results of the LD₅₀-test methods are used only as a tool to differentiate between category 3 and category 4 for selecting appropriate family and types of protection units. The LD₅₀-method is not sufficient for conducting a full toxicological evaluation.

3.14**non-domestic use**

application different from the domestic use (3.9)

3.15**overflow**

means for discharging naturally excess fluid from an appliance when it has reached a specified level

3.16**point of use**

point where water is drawn by the user either directly or by connecting an apparatus

3.17**pollution of potable water**

reduction in organoleptic (turbidity, odour), taste, chemical or biological quality of potable water

Note 1 to entry: Attention is drawn to DIRECTIVE (EU) 2020/2184 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2020 on the quality of water intended for human consumption

3.18**potable water**

water intended for human consumption

Note 1 to entry: Attention is drawn to DIRECTIVE (EU) 2020/2184 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2020 on the quality of water intended for human consumption

3.19**potable water installation**

water installation located downstream of the delivery point specified by the water supply authorities or regulations

Note 1 to entry: In DIRECTIVE (EU) 2020/2184 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2020 on the quality of water intended for human consumption the potable water system is denominated as "domestic distribution system".

3.20**protection point**

location in a hydraulic system where a protection unit is installed

3.21**protection unit**

device in combination with other hydraulic components which constitutes the protection against backflow

3.22**risk of flooding**

foreseeable situation where contact between non-potable water and potable water by penetration into the atmospheric openings of the anti-pollution devices is possible due to flooding of a room or area in a building in which anti-pollution device is installed

3.23**type of protection**

identified operating principle applied to a protection device belonging to a given family

3.24**upstream**

side from which fluid flows under normal conditions

4 Pollution of potable water: general observations**4.1 General**

The criteria in this clause shall be considered in any risk-based determination of the necessary protection device to prevent the pollution of potable water installations. The following conditions can give rise to risk of pollution of the potable water.

4.2 Backflow of non-potable water

The quality of the potable water distributed can be impaired when non-potable water flows back into the potable water installation.

4.3 Cross-connection

The quality of the potable water distributed can be impaired by a cross-connection with non-potable water, this can be an actual or potential physical connection between a potable water supply and any other non-potable water system.

4.4 External influences

Potable water cisterns, pipes and protection units shall be protected from external pollution (see the EN 806 series).

No other fluid shall be conveyed in a potable water installation (gas, compressed air, ventilation conduct, vapour, chemicals, water used in heating equipment, recycled water, drainage or run-off water, waste water, etc.) other than potable water. If it is considered possible that under the prescribed operation any contaminant could enter through the protection device (e.g. air gap, air inlet) into the potable water installation, additional corresponding protection measures are to be provided.

4.5 Materials

The quality of the potable water distributed can be impaired by the use of inappropriate materials.

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All materials coming into contact with water intended for human consumption shall present no health risk nor cause any change to the water in terms of quality, appearances, smell or taste.

They shall be compatible with each other, with the water supplied, and with the fluids or substances that can come into contact with them.

4.6 Stagnation

Stagnation (e.g. as a result of interruptions to operation and disconnection, see the EN 806 series) of potable water in the systems can result in impairment of the water quality due to a significant concentration substances released from materials or due to microbial proliferation.

The level of impairment depends on the materials used, the water quality, the ambient temperature (e.g. pipes for potable water in boiler rooms) and the duration of stagnation.

4.7 Inadequate or improper maintenance

Any insufficient or improper maintenance of the potable water installation including backflow protection devices can result in an impaired water quality. For proper maintenance see EN 806-5.

5 Analysis method of the pollution risks and choice of protection**5.1 General remarks**

Pollution in a potable water supply system can occur by:

- a) backsiphonage: by partial vacuum (drop in pressure) in the potable water supply system (due e.g. to the operation of a valve, the bursting of a pipe, the operation of a booster pump, excessive water demands in a part of the system, water taken for emergency use from a fire hydrant);
- b) back pressure: originated in a non-potable water system in which the pressure exceeds the pressure in the potable water system;
- c) back growth: back contamination pollution in the potable water installation as a result of proliferation of microorganisms, from the downstream system;
- d) stagnation, see 4.6.

5.2 Determination of fluid categories**5.2.1 General**

Fluids which could be in contact with potable water are classified in five categories as defined below.

5.2.2 Category 1

Water intended for human consumption coming directly from a potable water distribution system.

5.2.3 Category 2

Fluid recognized as being fit for human consumption, including water taken from a potable water distribution system, which has undergone a change in taste, odour, colour or an active change in temperature (heating or cooling).

5.2.4 Category 3

Fluid representing a slight human health hazard due to the presence of one or more harmful substances of low acute toxicity to be determined by the LD₅₀-method > 200 mg/kg, see 3.14 ¹.

5.2.5 Category 4

Fluid presenting a significant human health hazard due to the presence of one or more toxic or very toxic substances of high acute toxicity to be determined by the LD₅₀-method ≤ 200 mg/kg, see 3.14. or one or more carcinogenic mutagenic and reprotoxic (CMR) substances.

5.2.6 Category 5

Fluid presenting a human health hazard due to the presence of microbiological or viral elements.

5.2.7 Mixture of fluids

If fluids are mixed than the mixture will be classified according to the highest fluid category in the mixture (independent of the ratio).

5.3 Determination of the installation characteristics

5.3.1 General

The analysis of an existing or projected installation provides information about its characteristics and the fluid categories.

That information shall then be used to determine an appropriate protection unit to prevent pollution of the potable water supply or installation.

The analysis is done as described in the following clauses.

The result of this analysis is fixed by a cross in the appropriate field of the installation matrix (see Table 1).

5.3.2 Pressure

Locate the point(s) within the potable water installation that need to be protected against pollution.

Determine whether downstream of the protection point is subjected to atmospheric pressure ($P = \text{atm}$) or to a pressure exceeding atmospheric pressure ($P > \text{atm}$):

- the situation will be $P = \text{atm}$ if the protection point is subject to backsiphonage only (see Figure 4);
- the situation will be $P > \text{atm}$ if the protection point is subject to backsiphonage or back pressure (see Figure 5).

¹ The border between fluid category 3 and 4 is in principle LD₅₀ = 200 mg/kg body weight, in accordance with OECD 423, December 17, 2001.

When the outcome of the calculation method indicates that a dose equal or less than 200 mg/kg body weight of a fluid is deadly for at least 50 % of the animals, then the fluid is classified into category 4. When the calculation indicates that a dose of more than 200 mg/kg is required the fluid is regarded as less harmful and the fluid is classified into category 3.

Remark: In 2002 the original LD₅₀-test, OECD 401 (8), has been deleted from the OECD guidelines.

The LD₅₀-test method in this document is just used as a means for selecting appropriate protection unit. It is not intended as a replacement for undertaking a full toxicological evaluation of the health risk.