

# What is backflow and how do we prevent it?

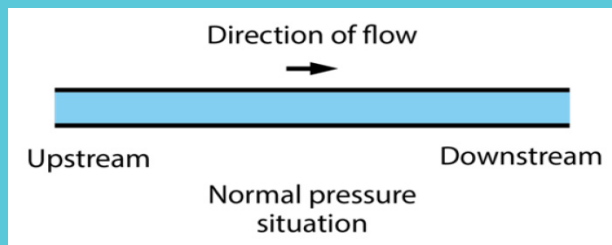


## What is backflow?

Backflow is a plumbing term that refers to the reversal of flow caused by back siphonage or back pressure, allowing used water back into the potable water supply. When this occurs, drinking water can become contaminated, putting the public at risk.

When water enters your property from the mains network, it should only ever flow in one direction; downstream of the network, towards the point of delivery. However, because water pressure changes in pipework, an unwanted reversal flow can occur and allow used water to be pulled back upstream into other parts of the plumbing system and/or flow can occur and allow used water to be pulled back upstream into other parts of the plumbing system and/or into the mains network.

**Backflow warning signs include noticeable changes to your water's smell, taste and colour.**



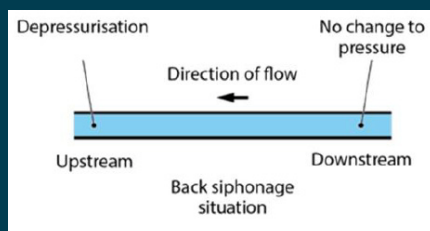
**The two most common causes of backflow are back siphonage and back pressure.**

## Back siphonage

Back siphonage occurs when there is a loss of pressure in the water supply causing a depressurisation of the water supply pipe. This creates a reversal flow, allowing the water to flow backwards into the mains network or/ and into other parts of your plumbing system. Fractured water mains, network maintenance and fire hydrant misuse are potential causes of back siphonage and submerged inlets are the biggest risk of contamination due to a back siphonage occurrence.

Common submerged inlet examples:

- A water supply pipe with the inlet submerged in a process water tank
- A hose submerged in drains/hazardous fluids or a swimming pool
- Chemical additives attached to hoses eg insecticides
- A water supply to an irrigation system



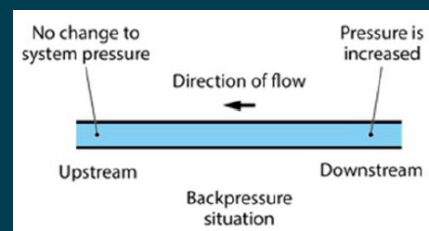
## Back pressure

Back pressure occurs when the plumbing system's pressure downstream is greater than the incoming supply pressure, forcing water to flow in the opposite direction to which it was intended.

Where the pressure in a used water line or non-potable water source is greater than the pressure in the potable water supply pipe is the most common cause of a back pressure occurrence.

Common examples of the causes of back pressure:

- Filling loops to boilers
- Cross connections with water from other sources e.g private well
- Pumped apparatus such as a jet wash



## How do you prevent backflow?

The installation of a suitably approved backflow preventer will avert the reversal of flow caused by back siphonage and back pressure. Its sole purpose is to prevent the contamination of drinking water.

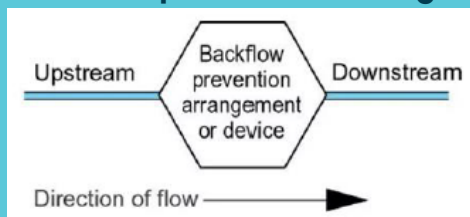
## What is a mechanical backflow preventer?

A mechanical backflow preventer is a device that is designed to allow water to flow in one direction only and operates automatically in response to system conditions. The device will always remain open as long as water is flowing in the right direction. Should flow stop or reverse, the valve closes immediately, preventing an upstream reversal of flow back into the mains network. Backflow preventers should be corrosion proof and they come in a range of different specifications. They should be suitably tested, approved and certificate for the purpose they are being used.

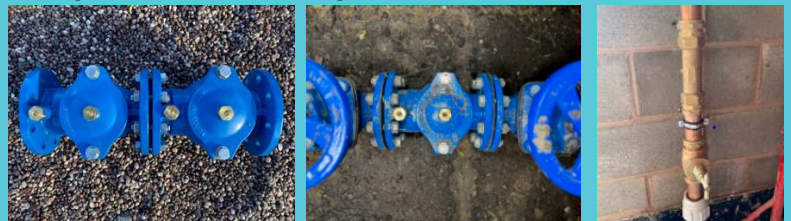
Note: As a condition of approval, some backflow preventers may only be installed in the horizontal plain. Please check the installation requirement notes (IRN) prior to installation \*\*IRNs detail other requirements that apply to products as a condition of approval\*\*

Important: Only backflow preventers that conform to the “Regulators Specification” for backflow prevention arrangement and devices can offer assurance of compliance with the Water Supply (Water Fittings) Regulations 1999; BS EN 13959 is the British Standard for check valves suitable for drinking water systems.

## Backflow prevention arrangement



## Examples of backflow preventers



## Backflow preventer maintenance/replacement

Important: The Water Supply (Water Fittings) Regulations 1999, do not give any specific requirements for the maintenance or replacement of a product, so it is the end user’s responsibility to maintain and replace the backflow preventer in accordance with Table A. 1 Frequencies and maintenance in BS EN 806-5:2012

## Backflow preventer requirements for new supplies

All commercial supplies require the installation of a backflow preventer on the incoming water supply pipe.

Generally a minimum of suitably approved double check valve is sufficient, but note the subject to risk assessments there may be a requirement for a higher level of backflow protection for some premises. The backflow preventer is commonly installed directly above the first incoming stop tap but this is dependant upon a risk assessment of the water system.

In some cases it may need to be installed in a self-contained chamber as close as reasonably practicable to the boundary with the adopted highway. The chamber should be sized to allow access for maintenance and repair.

Factors that determined the need for a boundary installation may include:

- Ground conditions
- Infrequent usage e.g. premises shut for long periods
- Length and diameter of pipe
- Excessive jointing
- Potential for external branch connections to taps/processes and supplies outbuildings

\*\*List not exhaustive\*\*

Backflow preventers should be readily accessible for inspection, operational maintenance and renewal.

Note: If there is a requirement for internal meter provision, the backflow preventer should be installed so that it is directly after the meter provision, ensuring there is still enough room for a water meter to be installed.

## Additional double check valve locations

There is also a mandatory secondary backflow requirement for supplies to multi-occupancy developments for self-contained apartments/units. The location of the backflow preventers will be dependent upon the design of the installation. This should be discussed with the local inspector prior to commencing work.

For student accommodation, where rooms are not self-contained, and hotels, there is only a requirement for additional backflow preventer to be installed on the branches supplying each floor level. This is known as zone protection.

Important: The backflow arrangements prescribed in this leaflet are a requirement for your connection to the mains network. Your plumbing installation may be subject to additional backflow requirements after the completion of a full water fittings inspection by a member of our Water Fittings Teams.

### Annex A (normative)

#### Frequencies for inspection and maintenance of components for potable water installations

Table A.1 contains information on frequencies for inspection and maintenance of various components for potable water installations.

Different requirements on inspection and maintenance may exist in the Member States. If national requirements exist, they shall be followed. This table is not exhaustive. Other components will require inspection and maintenance as well.

No.	Installation component and use	Reference document	Inspection	Restart maintenance
1	Unvalved air gas (AG)	EN 13375	Every 6 months	
2	Air gas with non-return/hydrostatic anti-siphonage (AG)	EN 13377	Every 6 months	
3	Air gas with ball/weighted ball non-returning air-trip stop (AG)	EN 13075	Once a year	
4	Air gas with friction (AG)	EN 13079	Every 6 months	
5	Air gas with pressure sensitive non-return (AG)	EN 14822	Once a year	
6	Air gas with over/low tested by vacuum measurement (AG)	EN 14823	Once a year	
7	Backflow preventer with controllable reduced pressure (BR)	EN 12729	Every 6 months	Once a year
8	Backflow preventer with different non-controllable reduced pressure (BR)	EN 14367	Every 6 months	Once a year
9	Non return atmospheric vent and routing element (BR)	EN 14451	Once a year	Once a year
10	Non return atmospheric vent and routing element (BR)	EN 14452	Once a year	Once a year
11	Non returnable with permanent atmospheric vent (BR)	EN 14453	Every 6 months	Once a year
12	Controlable antipollution check-valve (CA)		Once a year	Once a year
13	Non controlable antipollution check-valve (CA)		Once a year	Replacement every 10 years
14	Controlable antipollution double check-valve (CA)	EN 13959	Once a year	Once a year
15	Non controlable antipollution double check-valve (CA)		Once a year	Replacement
16	Mechanical diaphragm direct anti-siphon (DA)	EN 13433	Every 6 months	Once a year
17	Mechanical diaphragm hydraulic actuated (DA)	EN 13434	Every 6 months	Once a year
18	Non return backflow preventer (DA)	EN 14454	Once a year	Once a year
19	Shower hose union anti-siphon valve (DA)	EN 15550	Once a year	Once a year
20	Automatic diverter (DA)	EN 14550	Once a year	Once a year
21	Non return antipollution valve combined with a check-valve (CA)	EN 15550	Once a year	Once a year
22	Antipollution direct valve (CA)	EN 14455	Once a year	Once a year

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