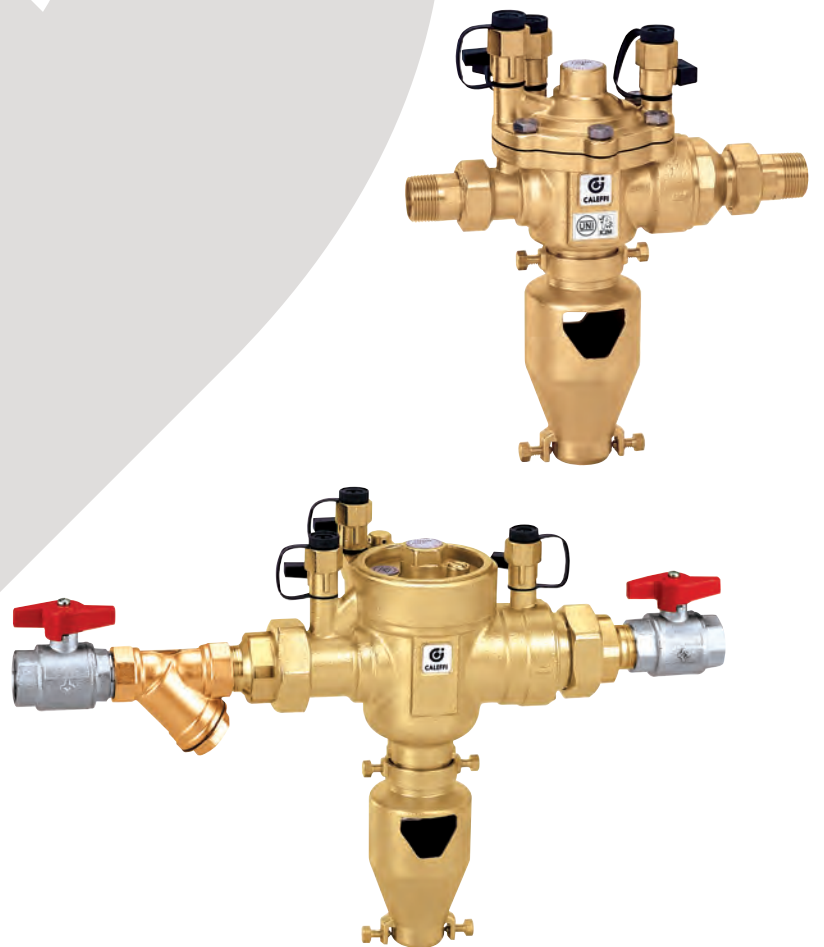


potable water

prevention of contamination



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Scope

This document is intended for persons responsible for the maintenance or the refurbishment of existing water installations and those responsible for the design of new installations.

It explains the different fluid categories and which common liquids fall within them and the devices which can be used to protect the water supply.

Introduction

There are legal requirements regulating water installations in domestic, commercial and health care premises.

These requirements make it a criminal offence for any person, whether the owner or occupier, to allow the wholesome water supply system within their premises to become:

- Contaminated
- Wasted
- Misused
- Unduly consumed

It is also a criminal offence to allow any contaminated water to backflow into the Water Undertakings distribution system.

Connections between wholesome and unwholesome water systems can create a serious risk to public health where backflow from a cross connection results in contamination of the wholesome water supply system.

Persons with the responsibility for the water installation within their premises should make themselves familiar with the appropriate legislation and the risks that can occur from the backflow and back siphonage of a contaminate.

The legislation which governs water installations within private premises is set out in:

- The Water Industry Act 1991
- The Water Supply (Water Fittings) Regulations 1999
- The Water Byelaws 2000, Scotland
- European standard EN 1717

To prevent the contamination of the wholesome water supply system, the Water Regulations require backflow protection devices to be installed at or near to all points where water is to be drawn off for use.

Introduction

This is generally described as the point of use protection, the type of device will depend upon the proposed use of water and the risk level posed to the wholesome water supply.

Subject to approval by the Water Undertaking, backflow devices may also be installed to provide zone or whole site protection.



potable water - prevention of contamination

Zone or Whole Site Protection

Zone or whole site protection is used when it is considered necessary to protect one building from another building or one part of a building from another part of the building.

Consideration to install zone or whole site protection is usually given to premises where industrial, chemical or medical processes are carried out. In all instances zone or whole site protection is in addition to and not as a substitute for the required point of use protection.

Fluid Categories

BS EN 1717:2000 'Protection against pollution of potable water in water installations and the general requirements of devices to prevent pollution by backflow' identifies 5 fluid categories, according to the degree of risk to health.

Category 1 is wholesome water

Category 1

Water used for human consumption provided by a water company.

Category 2

Fluid which does not present a health hazard, as in category 1, whose quality has been compromised as a result in changes to its temperature, taste, odour or appearance.

Category 3

Fluid which presents a slight health hazard due to concentrations of "low toxic" substances.

Category 4

Fluid that presents a significant health hazard due to concentrations of "toxic substances".

Category 5

Fluid that presents a serious health hazard due to concentrations of "pathogenic organisms, radioactive or very toxic substances".

For category 5 types of fluid an air gap separation must be used (A type).

Backflow preventers (BA type) can be used to protect against the risk of pollution from backflow for types of fluid up to category 4.

Whilst the 'BA' device is normally installed at the point of use, it can if considered necessary be used to provide zone or whole site protection..

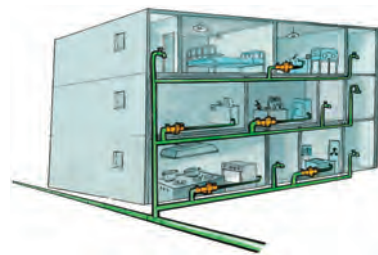
However it should be remembered zone or whole site protection is in addition to and not a substitute for the required point of use protection.

When a 'BA' device is installed to provide zone or whole site protection, the Water Undertaking will not regard the water downstream of the device as water supplied for domestic purposes. It is the responsibility of the owner or occupier of the premises to ensure the water is suitable for its intended use.

Zone or Whole Site Protection



Back Siphonage caused by a Fractured Mains Pipe.



'BA' Back Flow Preventer installed in a Hospital.



'BA' device installed in a Fire Fighting System

Fluid Categories

Category 1

Water undertakers have a duty to supply water which complies with the Water Quality Regulations made under Section 67 of the Water Industry Act 1991.

Compliance with which ensures a wholesome water suitable for domestic or food production purposes and this quality of water is classified as fluid category 1. Therefore, where ever practical water for drinking purposes should be obtained directly from a supply pipe, that is without any intervening storage before use.

Category 2

Fluid category 2 is water which could be classed as fluid category 1 except that it has undergone a change in taste, odour, appearance or temperature. These changes in water quality are aesthetic changes only and the water is considered to present no human health hazard.

Typical applications of fluid category 2 water in domestic situations are:

- a Water heated in a secondary hot water system
- b Mixtures of fluid categories 1 and 2 discharging from mixer tap or shower
- c Water that has been softened by a domestic common salt regeneration process

Note: Where a water softener is installed, water used for mixing with powdered milk for feeding babies should be drawn from an unsoftened supply. A person on a sodium restricted diet should follow their doctors instructions regarding drinking softened water.

Category 3

Fluid in category 3 represents a slight health hazard and are unsuitable for drinking or other domestic purposes.

Typical applications of fluid category 3 water are given below;

- a In houses or other single occupancy dwellings
 - i water in primary heating circuits, whether water treatment chemicals have been added to the system or not
 - ii water within a wash basin, bath or shower tray
 - iii water within clothes or dish washing machines
 - iv home dialysing machines
 - v hand held garden hoses with flow control spray or shut-off control
 - vi hand held fertiliser spray



Fluid Categories

Category 3

- b In premises other than single occupancy dwelling.

Where domestic fittings, such as wash basins, baths or showers are installed in commercial, industrial or other premises these appliances may still be regarded as category 3, unless there is a potentially higher risk. Typical premises in which some or all of these appliances may be regarded as justifying a higher risk category include hospitals and medical establishments.

- c Domestic garden or commercial irrigation systems, without insecticide or fertiliser additives, and with fixed sprinkler heads not less than 150mm above ground level.

Category 4

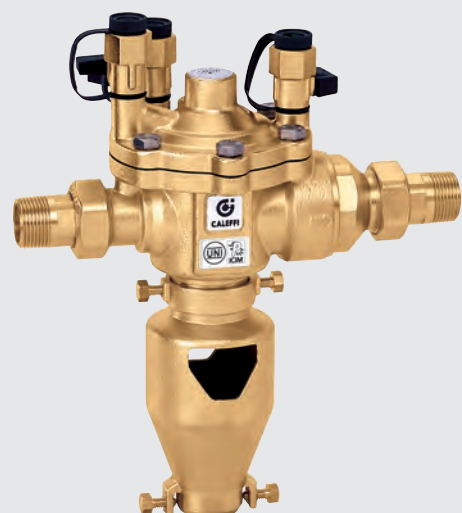
Fluid category 4 represents a significant health hazard and is not suitable for drinking or other domestic purposes.

'Carcinogenic substances' are those that may on prolonged exposure cause cancer.

'Environmental organisms' refer to micro-organisms, bacteria, viruses and parasites of significance for human health, which can occur or survive in the general environment e.g. legionella or cryptosporidium.

Some typical general applications of fluid category 4 are;

- a Water in primary and heating systems other than in domestic houses, irrespective of whether water treatment chemicals have been added or not.
- b Water treatment or softeners using other than salt
- c Clothes or dishwashing machines other than for domestic uses.
- d Mini-irrigation systems in domestic gardens without fertiliser or insecticide application such as pop-up sprinklers, permanent hoses or fixed rotating sprinkler heads fixed less than 150mm above ground level.



Category 5

Fluid category 5 represents a serious health hazard and is the most polluting category listed.

'Pathogenic organisms' are micro-organisms such as bacteria, viruses or parasites which are capable of causing illness, especially in humans e.g. Salmonella, Virgo Cholera, . They generally arise in living creatures and may be released to the environment, for example, in faecal matter, animal waste or body fluids.

Some typical general applications of fluid category 5 are;

- a Sinks, urinals, WC pans and bidets in any location
- b Permeable pipes or hoses in other than domestic gardens, laid below or at ground level, with or without chemical additives
- c Grey water recycling systems
- d Clothes or dishwashing machines in high risk premises

The principle distinction between category 4 and 5 is that the toxicity or concentration of substances in category 4 fluids is such that a prolonged period of exposure (days to weeks to months) is generally necessary before serious harm to health occurs.

Category 5 fluids are those which contain substances with higher toxicity or a greater concentration than category 4, resulting in them causing harm to health after short exposure a single or brief (minutes to hours) exposure.

Notes:

The list of examples in the table are typical for each fluid category but are not intended to cover every application in each sector.

Fluid category 5 risks can only be protected by the use of the appropriate type 'A' air gap device.

Fluid category 4 risk may be protected by 'A' or 'BA' devices.

Fluids containing environmental micro-organisms of potential health significance are fluid category 4. All fluids containing micro-organisms which cause human illness (pathogenic organisms are fluid category 5 and require a type A device).

All proposed installations of BA devices must be submitted to the local Water Supplier for approval.

The Water Supplier retains the right to 'veto' decisions and determine the fluid category risk assessment.

'Installations' carried out by an 'Approved Contractors' must be certified as being compliant with th Regulations.

Protection Matrix

Type of System	5	4
General		
Sprinkler fire fighting systems using anti freeze solution		•
Industrial cistern	•	
Non-domestic hose union tap	•	
Permeable hoses in other than domestic gardens, laid below or at ground level. with or without chemical additives	•	
Primary circuits and central heating circuits in non domestic property.		•
Reclaimed water systems	•	
Urinals, WC's and bidets	•	
Swimming pools	•	
Domestic or residential gardens		
Mini irrigation systems without fertilisers or insecticides such as pop-up sprinklers or porous hoses		•
Food processing		
Bottle washing machines		•
Butchery and meat processing	•	
Dairies		•
Food preparation		•
Slaughterhouse equipment	•	
Fruit and Vegetable washing	•	
Medical		
Medical or dental equipment with submerged inlets	•	
Bed pan washing	•	
Commercial clothes washing in health care premises	•	
Domestic appliances such as sinks, baths and wash basins	•	
Hospital dialysing machines	•	
Laboratories	•	
Mortuary equipment	•	
Catering		
Bottle washing machinery		•
Dish washing machines in commercial premises		•
Dish washing machines in health care premises	•	
Drink vending machines in which ingredients or CO ₂ are injected into the supply or distribution pipe.		•
Refrigeration equipment		•
Vegetable washing	•	
Industrial and commercial applications		
Brewery and distillation		•
Car washing and degreasing plants		•
Commercial clothes washing plants		•
Drain cleaning plant	•	
Dyeing equipment		•
Industrial and chemical plants	•	
Industrial disinfection equipment		•
Laboratories	•	
Mobile plant, tankers and gully emptiers	•	
Printing and photographic equipment		•
Water storage for agricultural purposes	•	
Animal drinking systems	•	
Water treatment plant or water softeners using product other than salt		•
Pressurised water for fire fighting systems		•
Water storage for fire fighting purposes	•	
Agricultural		
Commercial irrigation with outlets below or at ground level and/or permeable pipes, with or without chemical additives	•	
Commercial hydroponic systems	•	
Insecticide or fertiliser application	•	



Note: Only 'BA' devices which are approved by the Water Industry are permitted to be installed. A full list of all approved 'BA' devices can be found in the Water Industries 'Water Fittings and Materials Directory' published by the 'Water Regulations Advisory Service' WRAS.

E & O.E

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The Altecnic logo, featuring the word 'altecnic' in a lowercase, grey, sans-serif font. The letter 'a' has a small green square dot above it.