WATERLESS TRAPS

Guidance Notes

British Plastics Federation
PIPES GROUP

WATERLESS TRAPS

Introduction

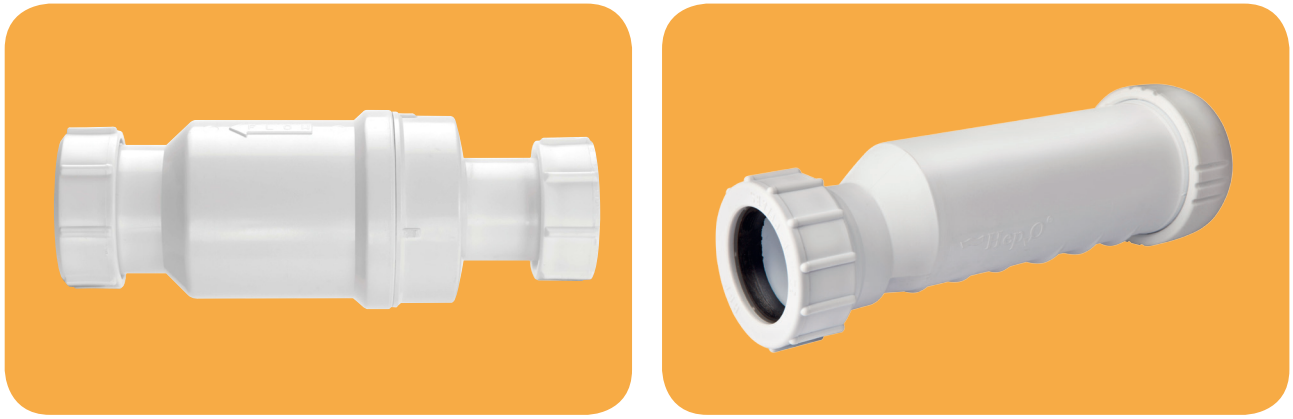
The UK Building Regulations require that any appliance, which discharges water to a drain, such as a wash hand basin; bath; shower; kitchen sink or WC, should be fitted with a trap. This is to prevent foul gases from the drainage system from entering the building.

Traditionally the trap has a water seal which allows wastewater to flow out whilst preventing foul sewer gases from entering the building.

Whilst the installation of water-seal traps is still common practice, there are a number of factors which can lead to loss of the water seal. Waterless traps have been available in the UK for over 20 years. They provide an alternative solution with a self-sealing membrane which allows waste water to flow out, whilst preventing foul sewer gases from entering the building.

This guide provides information on the advantages and limitations of water-seal and waterless traps, together with best practice for specifying, installing and maintaining waterless traps.

Typical examples of water-seal trap: bottle trap, S trap, P trap



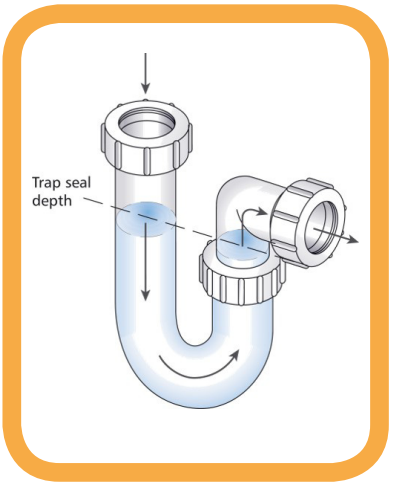
Typical examples of waterless trap

Regulatory Guidance

Approved Document H to the Building Regulations recommends that all points of discharge should be fitted with a trap (e.g. a water-seal trap) to prevent foul air from the system entering the building.

As positive and negative air pressure changes occur in the drainage system, through WC flushing etc., the water levels inside water traps will fluctuate. To ensure that a seal is maintained during these pressure fluctuations, Approved Document H requires that a minimum working seal of 25mm is maintained during use.

The diameter of the trap is determined by the waste connection fitted to the appliance, but the depth of seal required varies according to the type of appliance. For instance, a 40mm trap fitted to a 1½" BSP waste connection on a bath or shower requires a seal depth of 50mm, whereas the same diameter trap fitted to a dishwasher, kitchen sink or washing machine requires a deeper 75mm seal. This is to ensure that the seals continue to function should solids (e.g. food waste) pass through the fitting.[1]



Operation of a water seal trap showing waste water flowing from appliance to drain

Water-Seal Traps

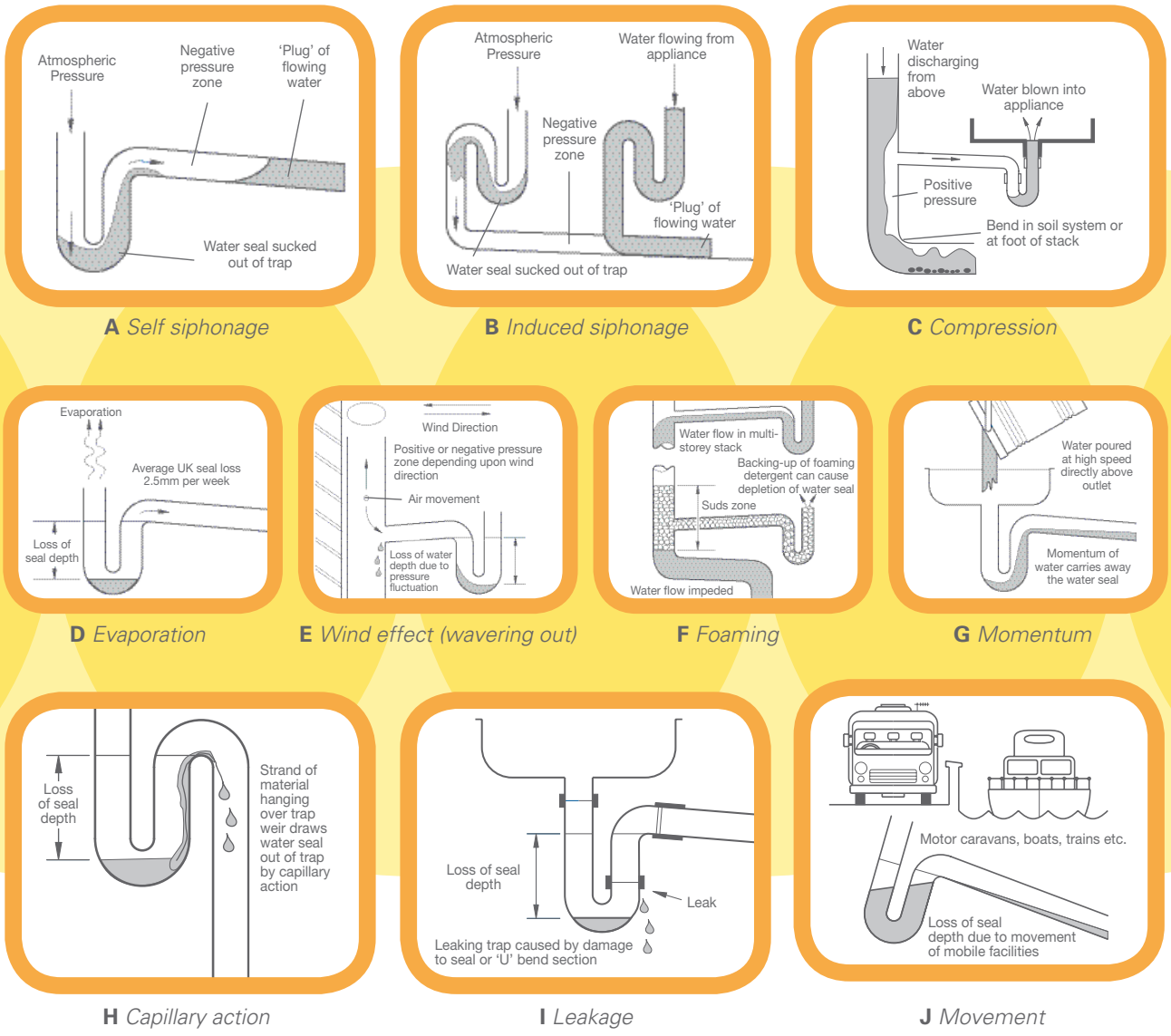
Advantages and Disadvantages of Water-Seal Traps

Advantages:

- Water-seal traps are covered by BS EN 274 *Waste fittings for sanitary appliances*
- Guidance on the use of traps in Approved Document H is centred on water traps
- Long established installation practice

Disadvantages:

- Certain factors can lead to a loss of water seal, see diagrams



Factors leading to a loss of water-seal

Alternatives to Water-Seal Traps

As an alternative to water traps, installers and specifiers have the option of using waterless traps.

Domestic sink with waterless trap

Domestic sink with water-seal trap

Often employing a type of flexible self-sealing membrane, waterless traps open during use and allow waste water to flow through the fitting, but close once the waste water drains through the fitting. This self-sealing action allows water to flow, whilst preventing foul sewer gases from entering the building.

Waterless trap cut-away showing membrane

Waterless Traps

Advantages and Disadvantages of Waterless Traps

Advantages:

- Cannot lose their seal due to the factors leading to loss of a water seal.
- Save space - no section of the fitting needed to retain water.
- Minimise requirement to cut holes into floors for low lying wastes, e.g. baths and showers.
- Maintain a seal even if water use is intermittent e.g. hot water discharge from unvented hot water storage systems[2]; condensate drains; holiday homes.
- Allow air to pass through the fitting on the inlet side - may be used to replace branch drainage ventilation removing the need for secondary ventilation pipework; separate small diameter AAVs on upstands or the use of anti-siphon traps.[3]

Disadvantages:

- Not covered by any European (EN) or International (ISO) Standard.
- Not specifically mentioned in Approved Document H.
- Risk that solids (e.g. food waste) may get caught in the membrane and lead to "gaping."
- Risk that the membrane can dislodge or become distorted.

Suitable Applications for Waterless Traps

Products made from polypropylene and ABS by BPF Pipes Group members are suitable for normal domestic applications including:

- Baths or showers
- Wash hand basins
- Kitchen sinks
- Urinals
- Washing machines
- TPRV discharge pipework on unvented hot storage systems
- Condensate drainage lines from condensing boilers or air conditioning units

Good Practice

Materials of choice – Care needs to be taken to ensure that the materials used to manufacture a waterless trap are suitable for the application for which it is intended. For instance, PP and ABS are suitable for use with intermittent discharges from T&PR valves of up to 100°C.

Orientation of trap – To reduce the risk of blockages, it is important to follow the manufacturer's instructions on orientation. Not all waterless traps can be installed horizontally or vertically, and some attention may be required to ensure the correct direction of flow.

Approved Document H also requires that traps are accessible for replacement and maintenance, which can be a challenge for modern bathroom design where drainage pipework is often concealed. Whilst waterless valves are less likely to lead to blockages, it is still recommended that, like conventional traps, appropriate measures are in place to allow access.

Unblocking - Care is needed when rodding, so that the membrane is not damaged.

Use of chemical cleaners - Self-sealing membranes or valves are usually made from a material other than ABS or PP, so care needs to be taken to ensure an appropriate level of chemical resistance is in place for the application for which it is intended. If there is any doubt, check with the manufacturer.

Standards and Approvals

There are currently no British (BS), European (EN) or International (ISO) Standards for waterless traps for above ground drainage systems. For this reason, product assessments might be based on other national or sector performance standards.

For each of the application areas, it is important to check for product assessment and/or test reports from a verified third-party (UKAS accredited or equivalent).

All plumbing should be installed in accordance with BS EN 12056.

1. For tables, see Approved Document H: 2002, section 1.
2. See BPF Pipes Group Guidance 'Discharge from unvented hot water storage cylinders into plastic sanitary pipework.'
3. See BPF Pipes Group Guidance 'Air Admittance Valves for Domestic Properties.'

A list of members who manufacture and supply waterless traps for domestic properties is provided on the BPF Pipes Group website, https://bpfpipesgroup.com/applications/building-services/