



Hep_vO[®] self-sealing waste valve



Technical Note TN10317

Description

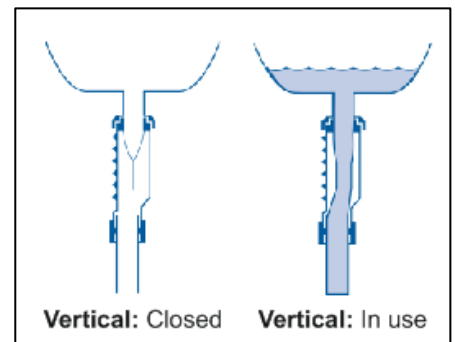


Hep_vO[®] is a self-sealing waste valve for use as an alternative to a traditional water seal trap, in particular where a water seal trap is not suitable, for example, due to climate, movement of the appliance or because of infrequent use. Its in-line design and the option of either horizontal or vertical installation can save space. The valve can also reduce the requirement for additional venting of some appliances.

Hep_vO[®] is made of a polypropylene body with an elastomeric membrane, in the form of a self-flattening tube, acting as a self-sealing valve. The self-closing membrane prevents foul air from drainage systems from entering the building and also acts as an insect barrier.

The valve is approximately 180 mm long and available in two sizes to connect to 32 mm or 40 mm discharge pipework. The two options for fitting (vertically or horizontally with an adaptor) provide the flexibility for installation in a wide range of appliances including sinks, showers, baths and washing machines.

Testing has been carried out by BRE and reviewed by WRC.



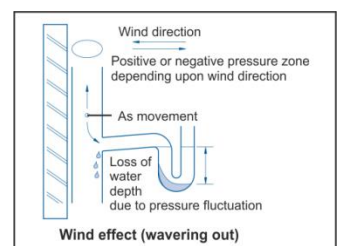
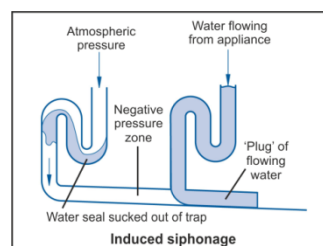
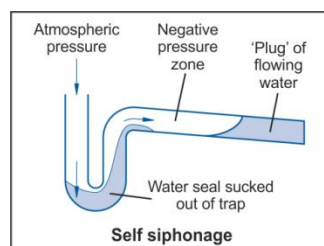
Plumbing design

Building Regulations require that any drainage system is designed so that foul air does not enter the building. The guidance specifies the minimum water trap seal depth necessary to achieve this requirement for each type of appliance.

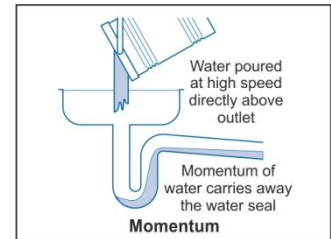
Good operation of water traps relies on there being a continuous air gap above the wastewater flow in the branch pipe to limit negative pressures and self siphonage.

Common modes of failures for water seal traps include:

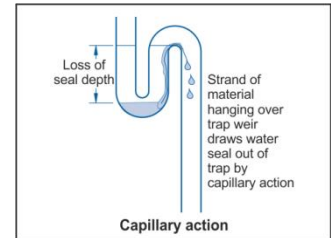
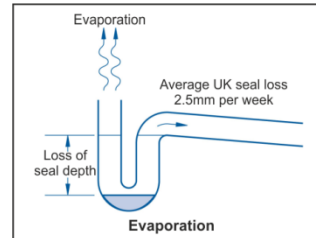
- Siphonage** - Loss of water seal due to negative pressure caused by self siphonage, induced siphonage or wind effects.



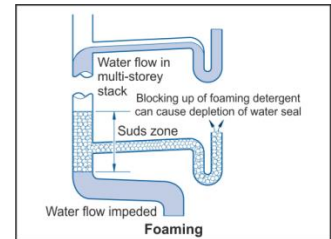
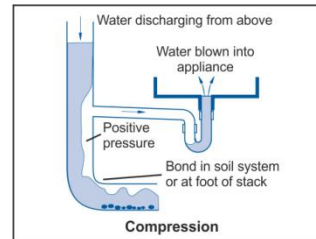
- **Displacement** of the water seal caused by the momentum observed when pouring a liquid rapidly.



- Loss of water seal depth due to **evaporation** (e.g. in the case of infrequent use and warm climates – see Technical Note TN10320), movement in mobile facilities (see Technical Note TN10319) or through **capillary action**.



- Displacement of the water due to **positive pressure** in the system and absence of air flow leading to compression or where **foaming** may be observed.



Other benefits arise where Hep_vO[®] is fitted to all appliances: in this case it may be possible to fit smaller diameter pipes as there is no need to oversize the pipe to ensure there is always a passage of air over the flow to avoid self-siphoning. The limitations, as listed in BS EN 12056-2:2000, on the maximum length, the number of bends and maximum drop along a branch pipe do not apply. For combined branch pipes, a suitable pipe size and gradient can be selected to accommodate the maximum simultaneous flow on the basis of the pipe running full.

The Hep_vO[®] has been tested and shown to resist a back pressure up to 0.05 bar (500 mm water pressure). This exceeds the performance of a 75 mm deep water seal trap and provides an effective barrier to the escape of foul odours, whilst also addressing the issues of siphonage, displacement, evaporation, capillary action and foaming.

The compact design of the Hep_vO[®] in conjunction with tight radius bends can enable space savings and compact design.



Where it may be used

As part of standard appliance waste systems Hep_vO[®] may be used as an alternative to water seal traps in drainage:

- From any appliance discharging grey water including normal domestic chemicals
- From urinals (vertical installation only)
- To provide a seal and ventilation of a branch pipe where this is required – see Technical Note TN10318
- For recreational vehicles (e.g. motor vans, caravans and boats) – see Technical Note TN10319
- That is used infrequently and in hot climate conditions – see Technical Note TN10320
- Carrying discharges from temperature relief valves or combined temperature and pressure relief valves on unvented hot water storage systems and primary thermal heat stores up to 500 litres nominal capacity – see Technical Note TN10321
- Condensate piping from high efficiency boilers or air conditioning units discharging to sanitary pipework – see Technical Note TN10321





But not used

The Hep_vO[®] should not be used:

- In wastewater systems disposing of liquid waste which are stronger than domestic chemicals
- On safety discharge pipework from hot water systems which are fitted with pressure only relief valves, not incorporating a temperature relief valve. In these cases the discharge (e.g. from boilers) could be significantly in excess of 100 °C

Mounting options for Hep_vO[®] valve

Hep_vO[®] can be mounted in two configurations, vertical or horizontal. Please refer to the installation procedures for detailed instructions and use good practice for installation of plastic fittings.

Installation	Appliances	Size of Hep _v O [®] valve
Vertical installation – preferred configuration		
	Pedestal basin Counter top basin Ducted basin Urinal	32mm Hep _v O [®]
	Washing machine	40mm Hep _v O [®]
Horizontal installation		
	Bidet	32mm Hep _v O [®]
	Bath or shower Sink (kitchen, utility)	40mm Hep _v O [®]

Performance tests

Test (short description of objective)	Relevant standard (and clause)	Hep _v O [®] equivalent to water seal trap
Water flow rate tests: opening characteristics and effect of simultaneous flow through adjacent valves	BS EN 274-2:2002 (5.1, 5.3, 5.5)	Exceeding seal trap requirements for both the 32mm and the 40mm valves in vertical and horizontal installation. Flows measured are greater than 60 l/min for the 32mm valve and greater than 100 l/min for the 40mm valve
Opening pressure	BS EN 12380:2002 (6.5)	The minimum opening air pressure for Hep _v O [®] is 54mm head (vertical orientation) and 57mm head (horizontal orientation)

Test (short description of objective)	Relevant standard (and clause)	Hep _v O [®] equivalent to water seal trap
Resistance to common chemicals: including cleaners and detergents containing sodium hydroxide and solvents such as turpentine, kerosene and paint thinners	Australian Standard procedure MP 52-2005: 10,000 cycles of 10s exposure to solution + 10s drainage Mechanical impact performance including expected domestic use (food, chemical and abrasive wastes)	HPB testing methodology (UKAS accredited)
Drop test	BS EN 12380:2002	Pass
Leak tightness	BS EN 274-2:2002	Pass
Fatigue cycling	Based on BS EN 1055:1996	Pass
Long term cyclic test for long term endurance	Australian standard ATS 5200.047:2005	Pass
Reliability experience	n/a	Trade experience and performance tests have proven that Hep _v O [®] is fit for the purposes for which it is intended

Strong acids, e.g. cleaners containing high concentrations of sulphuric acid, must not be used on Hep_vO[®].
When rodding or flushing with a sulphuric acid solution, the valve must be removed before the operation.
Hep_vO[®] is resistant to standard caustic-based drain cleaners.

References

- AS ATS 5200.047-2005. Technical specification for plumbing and drainage products - self-sealing devices.
- BSI. BS EN 274-2:2002. Waste fitting for sanitary appliances. Test methods.
- BS EN 1055:1996, Plastics piping systems. Thermoplastics piping systems for soil and waste discharge inside buildings. Test method for resistance to elevated temperature cycling.
- BSI. BS EN 1451-1:2000. Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Polypropylene (PP). Specifications for pipes, fittings and the system.
- BSI. BS EN 1490:2000. Building valves. Combined temperature and pressure relief valves. Tests and requirements.
- BSI. BS 4514:2001. Un-plasticized PVC soil and ventilating pipes of 82.4 mm minimum mean outside diameter, and fittings and accessories of 82.4 mm and of other sizes. Specification.
- BSI. BS 6700:2006. Design, Installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages. Specification.
- BSI. BS EN 12056-2:2000. Gravity drainage systems inside buildings. Sanitary pipework, layout and calculation.
- BSI. BS EN 12380:2002. Air admittance valves for drainage systems. Requirements, test methods and evaluation of conformity.
- CLG. The Building Regulations 2010. Approved document H. Drainage and waste disposal. (2015 Edition) [online] Available from: <http://www.planningportal.gov.uk/>
- CLG. The Building Regulations 2010. Approved document G. Sanitation, hot water safety and water efficiency. (2015 Edition) [online] Available from: <http://www.planningportal.gov.uk/>
- Hepworth Plumbing Products. Hep_vO[®] Self-Sealing Waste Valve. Product & Installation Guide. Wavin, Chippenham.