

Discharge from unvented hot water storage cylinders into plastic sanitary pipework systems

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Situation

To comply with the Building Regulations for England and Wales, the Water Supply (Water Fittings) Regulations and the Scottish Water Byelaws, a hot water system with a storage vessel must incorporate precautions to: (a) prevent the temperature of the water stored in the vessel at any time exceeding 100°C; and (b) ensure that any discharge from safety devices is safely conveyed to where it is visible but will not cause a danger to persons in or about the building.

To prevent the temperature of stored water exceeding 100°C, a temperature relief valve or a combined temperature and pressure relief valve needs to be installed to safely discharge the water in the event of serious over-heating. As set out in BS EN 1490:2000 '*Building valves. Combined temperature and pressure relief valves. Tests and requirements*', the nominal set temperature range at which temperature and pressure relief valves are set to operate is between 90°C to 95°C.

Under these controlled conditions, safety relief discharge pipework from unvented hot water storage systems up to 410 litres (500 litres nominal) capacity can be drained to plastic sanitary pipework. Attention needs to be paid to the plumbing design.

Note:

Uncontrolled temperature discharge such as that from pressure relief valves should not be drained through sanitary pipework as temperatures could reach in excess of 100°C but in any case is not permitted under G3.

The purpose of this short guide is to draw attention to the importance of good design and installation when discharging into plastic pipework systems.

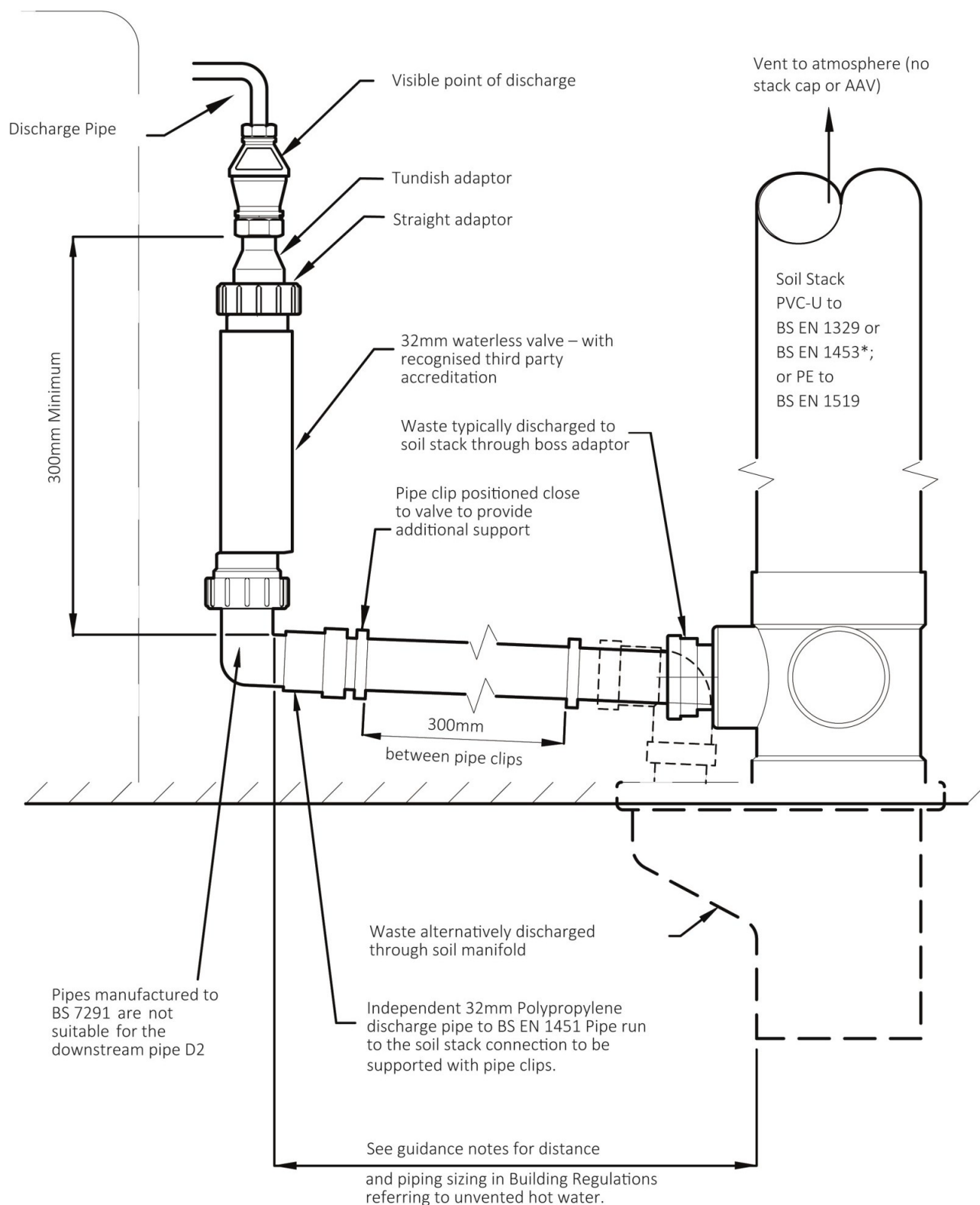
The British Plastics Federation (BPF) Pipes Group and its members strongly advise that compliance with the product standards listed in this guide is verified by a third-party certification scheme (for example, the BSI Kitemark).

Good plumbing design

The configuration of the safety relief discharge pipework, for discharge of hot water from a valve through a metal discharge pipe (D1) of diameter up to DN22 into plastic sanitary pipework, is shown in the diagram on page 4.

Specific points of good plumbing practice are highlighted:

- The use of tested and approved self-sealing waterless valves for connecting to internal sanitary pipework is helpful when it is impractical to route the discharge pipework directly to an external point in a visible location.
- Self-sealing waterless valves should be used as they prevent foul sewer gases from entering the building. Water traps are not suitable in this situation as they dry out.
- A tundish adaptor ensures the minimum 300mm below the tundish before any elbows or bends in the pipework recommended in Approved Document G can be achieved.
- The waterless valve needs to be installed vertically fixed in place with a bracket and adjacent the storage cylinder. The valve needs to be visible and accessible.
- A suitable plastic pipe (such as polypropylene complying with BS EN 1451-1) supported at maximum 300mm intervals, may be used for downstream pipe D2.
- A maximum distance between clips of 300mm provides adequate support to the pipe D2 in the event of discharge from safety devices. Guidance on clipping distances for waste pipes from sanitary appliances is not appropriate to this situation.
- Pipes manufactured to BS 7291 Parts 1 to 3 should not be used for the downstream pipe D2. These are designed for water supply and are not suitable for waste discharge.
- It is critical that safety devices on the unvented hot water storage system are subject to annual safety checks to prevent any risk of failure and potential property damage.



** PVC-U Pipes to BS EN 1453 manufactured with two solid PVC layers or two solid PVC layers with a non-foamed PVC intermediate layer may be used for this application.*

Additional Installation Considerations

- Routing of the pipework should be carefully considered to minimize the number of joints and therefore minimize possible points of leakage.
- Where a waterless valve and plastic pipework (pipe D2) are used, the pipework should not be connected to a stack unless it can be demonstrated that the stack is capable of withstanding temperatures of the water discharged.
- Given the high temperatures reached during valve operation, pipework should be connected to the soil stack using an appropriately sized boss / branch pipe fitting. Strap, clip or patch bosses typically used in the retro-fit of sanitary appliances are not suitable. An acceptable alternative would be to connect to a soil pipe manifold.
- Pipe D2 should be axially aligned with the boss / branch pipe fitting to create a good seal. Inserting the pipe at an angle might introduce a point of leakage. The pipe should be supported at the point it enters the adaptor or boss / branch pipe fitting to minimize movement at the joints.
- Where an adaptor is needed to connect a plain-ended pipe to a boss / branch pipe fitting, the adaptor and the boss / branch pipe fitting should be supplied by the same manufacturer to ensure dimensional compatibility.
- The soil stack should be vented to the atmosphere (i.e. stack cap or air admittance valve not to be used). Reference is made to Approved Document G. Frequently Asked Questions, March 2016, which can be found at [Sanitation, hot water safety and water efficiency: Approved Document G](#)
- The soil stack should be constructed from a suitable plastic pipe (such as PVC-U to BS EN 1329-1 or PE to BS EN 1519-1). PVC-U pipes to BS EN 1453-1 manufactured by BPF Pipes Group members (having two solid PVC layers or two solid PVC layers with a non-foamed PVC intermediate layer) may be used for this application.