

# DESIGN AND INSTALLATION

## VENTILATION

A drainage pipe is normally at neutral air pressure compared to the surrounding atmosphere. When a column of wastewater flows through a pipe, it compresses air in the pipe, creating a positive pressure that must be released or it will push back on the waste stream and downstream traps' water seals. As the column of water passes, air must flow in behind the waste stream or negative pressure (suction) results. The extent of these pressure fluctuations is determined by the waste discharge fluid volume.

The purpose of a ventilation stack is to control pressure in the pipework to prevent foul air from the wastewater system entering the building. Below are some of the main configuration principles, but combinations and variations are often required (see standard EN 12056-2). The purpose of a ventilation stack is also to avoid accumulation of dangerous gases.

Black water and grey water can be drained either in separate or in a single discharge stack. The rules for duct sizing are different depending on the option selected.

### Primary ventilated system configurations:

Control of pressure is achieved by air flow in the discharge stacks. The soil stacks extend in main roof vents to above and out of the roof. Alternatively, air admittance valves may be used. They are pressure-activated, one-way mechanical vents, used in a plumbing system to eliminate the need for conventional pipe venting and roof penetrations.

*A single stack is still possible but design precautions must be taken to prevent self-siphonage.*



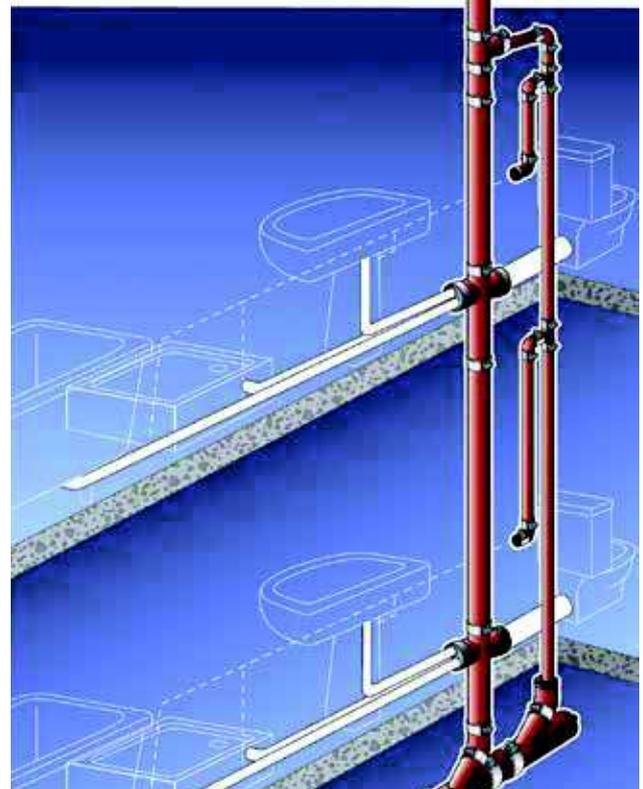
### Secondary ventilated system configurations

In buildings of three or more storeys, if the air pressure within the stack suddenly becomes higher than ambient, this positive transient could cause wastewater to be pushed into the fixture, breaking the trap seal.

Vent stacks are put in parallel to waste stacks to allow proper venting and prevent such disorders. Air admittance valves may also be used in this configuration.

Under many building codes, a vent stack, a pipe leading to the main roof vent, is required to the draining fixtures (sink, toilet, shower stall, etc.).

*To allow only one vent stack and therefore one roof penetration, as permitted by local building codes, sub-vents may be tied together and exit a common vent stack.*



## SINGLE STACK BRANCH

The single stack branch is a patented device made to allow wastewater drainage without secondary vent pipes.

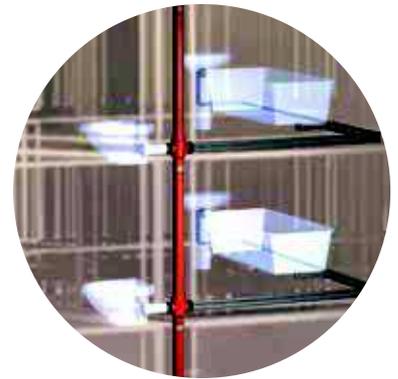
Provided the maximum number of connected sanitary appliances is respected, the single stack branch properly drains wastewater in a single stack, without vent pipes, whilst limiting the risks of self-siphonage. This device complies with the regulation and with standard EN 12056. The branch for a single downpipe allows wastewater drainage in a combined network without secondary ventilation according to EN 12056.

*\*Consult local requirements for compliance.*

### Field of use:

- > Multi-connection of sanitary appliances for adjacent apartments, or sanitary blocks
- > Compactness when space is limited
- > No secondary vent pipes are required.

**Benefits:** It simplifies plumbing by grouping pipework from 3 or 4 times more sources than a conventional installation. Maximum connections for each floor level: 2 toilets, 2 bathtubs and all the usual sanitary facilities for two apartments (sinks, basins, showers, etc.). The single stack branch is particularly suitable for narrow service shafts, hotel rooms, student apartments or any other building with adjacent sanitary blocks.

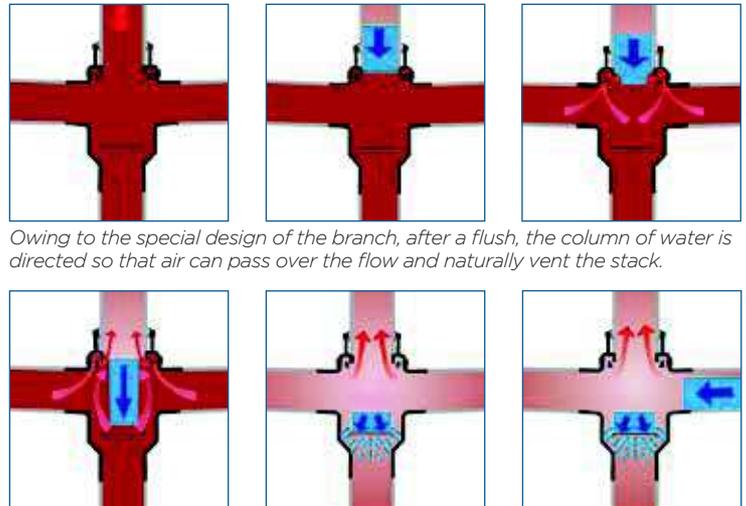


### Operation features

- > System under French Technical Approval.
- > Prevents excessive pressure variations in the stack system.
- > Limits negative pressure by optimal venting and prevents self-siphonage.

The single stack branch DN 100 main body is connected to the stack using standard couplings and a traditional jointing method. Their watertightness is ensured by the rubber gaskets which equip the S and Plus ranges offered by Saint-Gobain PAM.

The overall plumbing works shall be executed in compliance with standard EN 12056: the appliances shall be installed with traps in compliance with the specifications of the same standard.



*Owing to the special design of the branch, after a flush, the column of water is directed so that air can pass over the flow and naturally vent the stack.*

*Inside the branch, at the bottom of the body, a rubber deflector sprays the column of water to prevent draught or self-siphonage.*



### Solution

The single stack branch exists as a long tail to allow connection to the main stack under the slab and thus facilitate installation either in new or renovation works.

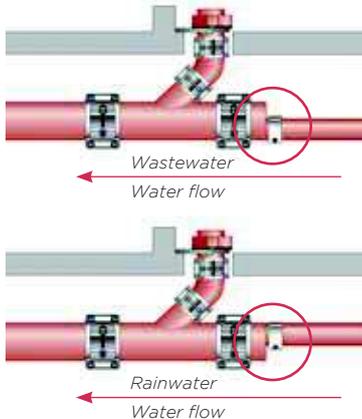
Three different products, 2 or 3 inlets:

- > Corner branch two inlets 88°
- > Double branch two inlets 88°
- > A consecutive branch, three inlets 88°

Rubber plugs with several pre-cut lids will allow one to three different connections.

# DESIGN AND INSTALLATION

## WATER FLOW AND AIR CIRCULATION, ACCORDING TO STANDARDS EN 12056-2 AND EN 12056-3



The internal diameter of pipes cannot be reduced in the direction of the water flow, except in the case of pipework operating at full bore, under negative pressure such as in the EPAMS siphonic roof drainage system. The addition of branch connections, or changes of fall liable to increase the water flow rate, may require an increase in internal pipe diameter. This increase can be applied upstream of the new branch connection, using a tapered pipe (see p.90).

### Rainwater horizontal pipelines

In horizontal and near horizontal pipelines, increases in size shall be installed so that the soffits is continuous, to prevent air from being trapped.

## ROOF PENETRATION DEVICE

To secure roof watertightness, which is of crucial importance, the number of roof penetrations should be limited. Saint-Gobain PAM has designed a roof penetration device for its pipe systems that is watertight and quick to install.

The system was developed to facilitate the installation of completely watertight roof penetration for cast iron primary ventilation pipes or vent pipes. The flanged fittings clamp both the vapour barrier and the waterproofing layer.



The roof penetration device is a set of two ductile iron flanged fittings - one of the flanges is fixed, the second is movable - equipped with rubber gaskets. Rubber gaskets are available in EPDM or NBR quality where hydrocarbons may be present.

See product codes on p.95



The first flange fitting, installed above the roof, clamps the vapour barrier under the roof insulating layer, the second, above the insulating layer, clamps the waterproofing layer, whether it is polymer or bituminous.

