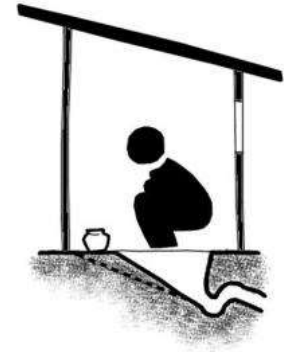


## Pour-flush Toilet

**Compiled by:** *Eawag (Swiss Federal Institute of Aquatic Science and Technology), Martin Wafler (seecon international gmbh), Dorothee Spuhler (seecon international gmbh)*

A pour flush toilet is like a regular cistern flush toilet except that the water is poured in by the user, instead of coming from the cistern above. When the water supply is not continuous, any cistern flush toilet can become a pour flush toilet.



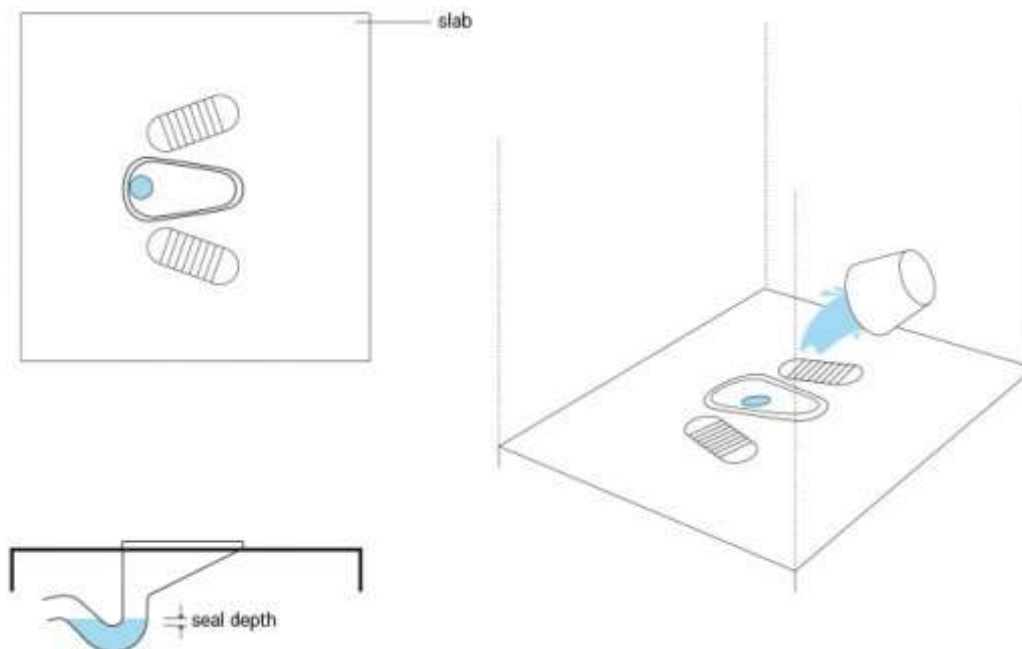
In	Out
Urine, Faeces, Freshwater, Dry Cleansing Materials, Anal Cleansing Water	Blackwater, Faecal Sludge

[no-ecompndium]

### Introduction

[/no-ecompndium] Just like a [cistern flush toilet](#), the pour flush toilet has a water seal that prevents odours and flies from coming back up the pipe. Water is poured into the bowl to flush the toilet of excreta; approximately 2 to 3 L is usually sufficient. The quantity of water and the force of the water (pouring from a height often helps) must be sufficient to move the excreta up and over the curved water seal.

Both pedestals and squatting pans can be used in the pour flush mode. Due to demand, local manufacturers have become increasingly efficient at mass-producing affordable pour flush toilets and pans. [no-ecompndium]



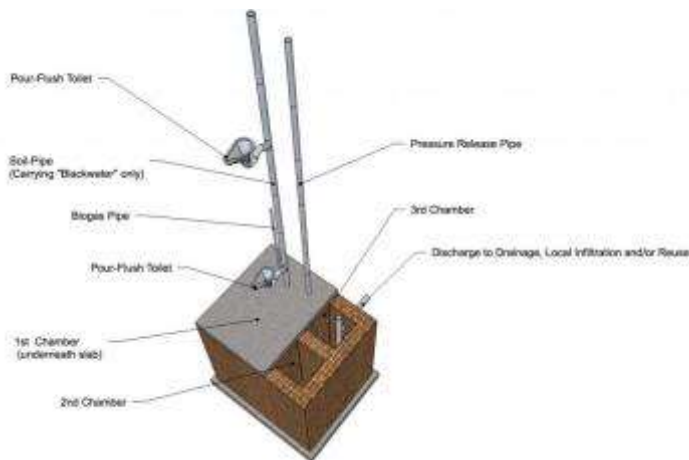
*Schematic of the Pour-flush Toilet. Source: TILLEY et al. (2014)*

[/no-ecompndium]

## Design Considerations

The water seal at the bottom of the pour flush toilet or pan should have a slope of at least 25°. Water seals should be made out of plastic or ceramic to prevent clogs and to make cleaning easier (concrete may clog more easily if it is rough or textured). The S-shape of the water seal determines how much water is needed for flushing. The optimal depth of the water seal head is approximately 2 cm to minimize the water required to flush the excreta. The trap should be approximately 7 cm in diameter. [no-ecompndium] Pour-flush pans can be connected to [twin-pit for pour-flush latrines](#), a pre-treatment and treatment units such as [septic tanks](#), [biogas settlers](#), [anaerobic baffled reactors](#), [toilet-linked biogas plants](#) etc. or a [small-bore or solids-free sewer](#) or [conventional sewer system](#). The collection system on its turn has to be connected to a appropriate treatment system (see also [wastewater treatment](#)).

## Superstructure



Perspective sketch of Malaprabha Biogas Plant with attached pour-flush toilets. Source: WAFLER (2009)

The superstructure's primary function is to provide privacy and protection to the user from the natural elements. The costs for the superstructure vary depending upon the kind and type of construction technique and material used (e.g. bamboo, mud, bricks, cement blocks, woven palm fronds, etc.). Construction of a temporary superstructure, which can be replaced afterwards with a permanent one, may be considered.

[/no-ecompndium]

[ecomp-appropriateness]

## Health Aspects/Acceptance

The pour flush toilet (or squatting pan) prevents users from seeing or smelling the excreta of previous users. Thus, it is generally well accepted. Provided that the water seal is working well, there should be almost no odours and the toilet should be clean and comfortable to use. [no-ecompndium] Pour-flush toilet pans are most commonly used in combination with a single- or twin pit pour flush latrine and therefore installed outside the house. However, due to the water seal that effectively prevents odours and flies from coming back up the pipe, pour flush pans can also be installed inside the house. This can on one-hand side help in reducing construction costs (shared walls and roof) and increase user's comfort (no need to leave the house for visiting the toilet). [/no-ecompndium]

## Operation & Maintenance

Because there are no mechanical parts, pour flush toilets are quite robust and rarely require repair. Despite the fact that it is a water-based toilet, it should be cleaned regularly to maintain hygiene and prevent the buildup of stains. To reduce water requirements for flushing and to prevent clogging, it is recommended that dry cleansing materials and products used for menstrual hygiene be collected separately and not flushed down the toilet.

## [no-ecompndium] Urine diversion pour-flush pans

(Adapted from: WATERAID 2008)

The urine diversion pour-flush pan, also known as wet ecosan pan, is essentially a modification of the conventional pour-flush squatting pan, but separates urine and faeces. This type of pan is especially useful in areas where plenty of water is easily available and handling of faeces is socially undesirable.

Both the pans have two holes - one for faeces and one for urine. The area between the holes is sloped towards the faeces hole as the water is collected together with the faeces. See also [urine diversion components](#).



Nepalese urine-diversion squatting pan made from cement (left) and fibreglass (right) (water seal not shown). Source: WAFLER (2009)

## At a Glance

<b>Working Principle</b>	A pour-flush toilet is like a regular flush toilet except that instead of the water coming from the cistern above, it is poured in by the user. It can be constructed inside or outside the house but requires a adapted treatment for the outflowing blackwater (e.g. twin-pits, septic tanks, biogas settler).
<b>Capacity/Adequacy</b>	The water seal is effective at preventing odours and it is appropriate for those who sit or squat (pedestal or slab) as well as those who cleanse with water. It is only appropriate when there is a constant supply of water available.
<b>Performance</b>	Depends strongly on user's operation and maintenance.
<b>Costs</b>	Depends on material used (concrete, fibreglass, plastic, stainless steal, etc.) and transport distance.
<b>Self-help Compatibility</b>	In general, can not be manufactured locally.
<b>O&amp;M</b>	Because there are no mechanical parts, pour-flush toilets are quite robust and rarely require repair. Should be cleaned regularly to prevent the build up of organics and or/stains.
<b>Reliability</b>	High, if maintained well.
<b>Main strength</b>	Water seal effectively prevents odours.
<b>Main weakness</b>	Requires a constant source of water.

[/no-ecompendium]

## Applicability

The water seal is effective at preventing odours and it is appropriate for those who sit or squat (pedestal or slab) as well as those who cleanse with water. It is only appropriate when there is a constant supply of water available. The pour-flush toilet requires (much) less water than a traditional cistern flush toilet. However, because a smaller amount of water is used, the pour-flush toilet may clog more easily and thus, require more maintenance.

If water is available, this type of toilet is appropriate for both public and private applications. Pour-flush toilets are

adequate for almost all climates.

## ***Advantages***

- The water seal effectively prevents odours
- The excreta of one user are flushed away before the next user arrives
- Suitable for all types of users (sitters, squatters, wipers and washers)
- Low capital costs; operating costs depend on the price of water

## ***Disadvantages***

- Requires a constant source of water (can be recycled water and/or collected rain water)
- Requires materials and skills for production that are not available everywhere
- Coarse dry cleansing materials may clog the water seal

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**For further readings, case studies, awareness raising material, training material, important weblinks or the related powerpoint presentation, see [www.sswm.info/category/implementation-tools/wastewater-treatment/hardware/user-interface/pour-flush-toilet](http://www.sswm.info/category/implementation-tools/wastewater-treatment/hardware/user-interface/pour-flush-toilet)**