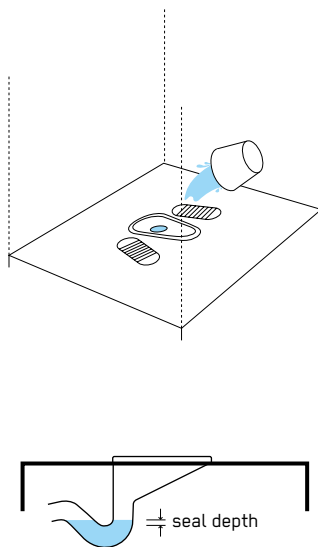


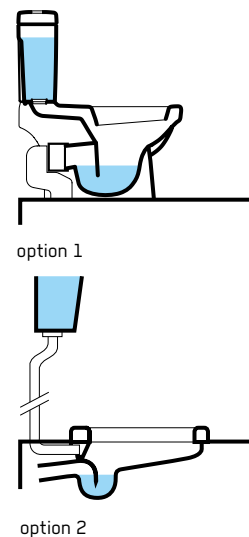
Flush Toilet

Phase of Emergency	Application Level / Scale	Management Level	Objectives / Key Features
** Acute Response ** Stabilisation ** Recovery	** Household ** Neighbourhood ** City	** Household * Shared * Public	Barrier between user and excreta, Flushwater needed, Reduction of odour / flies
Space Required	Technical Complexity	Inputs	Outputs
* Little	* Low	● Faeces, ● Urine, ● Flushwater, (● Anal Cleansing Water), (● Dry Cleansing Materials)	● Blackwater

pour flush toilet



cistern flush toilet



There are two types of Flush Toilets: the pour flush toilet, where water is poured in manually by the user, and the cistern flush toilet, where the water comes from a cistern above the toilet. A cistern flush toilet is directly connected to the water supply network. When the water supply is not continuous, any cistern flush toilet can become a pour flush toilet.

A Flush Toilet has a water seal that prevents odours and flies from coming up the pipe. For pour flush toilets, water is poured into the bowl to flush excreta away; approximately 1 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 excreta up and over the curved water seal. In cistern flush toilets, water is stored in the cistern above the toilet bowl and is released by pushing or pulling a lever. This allows water to run into the bowl, mix with the excreta, and carry it away. Alternatively water can be poured in manually using a bucket (pour flush toilet). Both pedestal and squat toilets can be

used. Due to demand, local manufacturers have become increasingly efficient at mass-producing affordable Flush Toilets.

Design Considerations: The U-trap that facilitates the flush toilet water seal 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 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 minimise water required to flush the excreta. The trap should be approximately 7 cm in diameter. Modern cistern flush toilets use 6 to 9 L per flush, whereas older models were designed for flush water quantities of up to 20 L. There are different low-volume Flush Toilets currently available that can be used with as little as 1.5 L of water per flush. A plumber is required to install a Flush Toilet to ensure that all valves are connected and sealed properly, therefore, minimising leakage.

Materials: Cistern flush toilets are typically made of porcelain and are a mass-produced, factory-made user interface. Squatting slabs can be made locally with concrete (providing that sand and cement are available), fibreglass, porcelain or stainless steel. Wooden or metal moulds can be used to produce several units quickly and efficiently. Prefabricated pedestals and squatting slabs made from plastic are also available, as are water seal devices that can be attached to squatting slabs.

Applicability: A Flush Toilet is only appropriate where a constant supply of water is available. The water does not need to be of drinking quality. Greywater can be recycled for flushing. The amount of organics and pathogens should be small, in order to prevent piping from clogging due to the growth of biofilm and to prevent user exposure to pathogens. The Flush Toilet is appropriate for those who sit or squat (pedestal or slab), as well as for those who cleanse with water or toilet tissue. The pour flush toilet requires (much) less water than a 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. Generally, pour flush is most suitable for pit or offset pit toilets and possibly Septic Tanks (S.13) close to the toilet. A cistern flush toilet should only be considered if all of the connections and hardware accessories are available locally. If water is available, this type of toilet is appropriate for both public and private applications. Flush toilets must be connected to a collection and storage/treatment or conveyance technology to receive the blackwater.

Operation and Maintenance: A pour flush toilet has no mechanical parts and is thus robust and rarely requires repair. Despite the fact that it is a water-based toilet, it should be cleaned regularly to maintain hygiene and prevent the build-up of stains. Cistern flush toilets require maintenance for the replacement or repair of some mechanical parts or fittings. Buttons, levers and the mechanisms inside the cistern are especially vulnerable. To reduce water requirements for flushing and to prevent clogging, dry cleansing materials, products used for menstrual hygiene and solid waste in general should not be flushed down the toilet. This may need to be addressed as part of hygiene promotion activities (X.12) and requires a solid waste management (X.8) scheme.

Health and Safety: The Flush Toilet is a safe and comfortable solution provided it is kept clean. Anal cleansing material should be provided, and a handwashing station has to be in close proximity to the toilet.

Costs: The cost of a Flush Toilet depends very much on the model chosen and additional costs for subsequent collection, conveyance, treatment and disposal technologies should be considered. Operating costs depend on the price of water. Cistern flush toilets are more expensive than pour flush toilets.

Social Considerations: The Flush Toilet 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 odour and the toilet should be clean and comfortable to use. Flush Toilets should reflect local user preferences (sitter vs. squatter, anal cleansing practices, direction etc.) and should account for the accessibility and safety of all users, including men, women, children, elderly and disabled people (X.10).

Strengths and Weaknesses:

- ⊕ 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, washers, wipers with toilet tissue)
- ⊕ Low capital costs; operating costs depend on the price of water
- ⊖ Requires a constant source of water (can be recycled water and/or collected rainwater)
- ⊖ Requires materials and skills for production that are not available everywhere
- ⊖ Coarse dry cleansing materials may clog the water seal

→ **References and further reading material for this technology can be found on page 190**