



Sharing what we know... Sheet : Composting Toilets



A composting toilet treats sewage onsite, recycling nutrients into fertiliser that you can use it on the garden. There are many types of composting toilet, from expensive proprietary systems to simple self-build designs. Keeping urine separate is usually the key to successful composting, otherwise it can become anaerobic and smelly.

A composting toilet is a good option where there's a limited water supply, because it needs no water for flushing. On a completely water-free site, you could use alcohol gel for hand cleansing, but otherwise you'll need handwashing facilities.

The composting process

Excreta falls into a composting chamber directly beneath the toilet pedestal. Naturally occurring bacteria, fungi, worms and other organisms thrive on this organic matter and break it down into humus. The use of an appropriate 'soak' material is necessary, as is controlling moisture through urine separation and ventilation.

Human excreta can contain pathogenic bacteria, viruses and protozoa, and may be dangerous to human health. Composting kills these human pathogens and the finished compost is safe and free from odour. The compost, usually removed once per year, is an excellent soil conditioner ideal for use on ornamental flowers and shrubs.

Twin chamber composting

A reliable and robust approach for the UK climate is to alternate annually between two separate chambers. The active chamber fills with excreta and soak over the course of the first year. When it reaches capacity the pedestal is moved across to the resting chamber for the second year. The contents of the first chamber then have a full year to compost with no fresh additions. By the end of the second year the contents of the original chamber are fully composted and can safely be removed. To continue the cycle the pedestal is moved back above the empty chamber while the other matures. This batch processing means there is no contamination of mature compost with fresh faeces.

Venting the Chamber

Appropriate ventilation is essential for effective composting, preventing bad odours. Design the vent to draw air across the top of the chamber, to promote the compost process. It should also draw air from inside the toilet cubicle, down the toilet pedestal. Passive ventilation is possible with careful design. Alternatively, a low wattage fan gives excellent results and costs only a few pounds per year to run.

To prevent bad odours it's essential to stop air being blown up into the cubicle from the chamber. This problem can occur in inadequately designed toilets on windy days. You'll need a properly sealed compost chamber, so it may be wise to seek detailed advice from a competent installer.

Fly control

Keeping the compost fairly dry, for example with urine separation, will minimise the risk of a fly infestation. A well-sealed chamber and a protected vent should stop flies entering. Flies inside the chamber can be attracted to a dedicated fly-trap or to the light shining down a vent pipe, becoming trapped at the fly screen at the top. See the related question below for more on fly control.

Soak

You'll usually need to add a 'soak' material to the composting chamber to aid the decomposition process. In our experience, wood-shavings work very well. Conventional wisdom is to add soak after every toilet use (as an alternative to the flushing ritual). You should add only just enough soak as is necessary in order to keep the chamber size as small as possible.

In a public toilet, people not used to composting toilets may put too much soak down a toilet. This affects the composting process whilst the cubical can also become scruffy, with sawdust scattered about. Our experience at CAT is that a daily or even weekly addition of soak by 'the operator' may be better than leaving users to add it indiscriminately.

Urine separation

For effective odour-free composting in the UK climate it is essential to divert the urine from the compost chamber. Urine separating toilet pedestals are available that intercept urine on a metal plate and divert it to a drain. Separation only works when users are sitting down. Because men often won't sit to pee unless forced to, it may be worthwhile installing a separate urinal (which can be waterless). This could lead to the same drain, or to collection for re-use as fertiliser.

Urine separation systems can be self-built, but proprietary urine-separating seats or pedestals are available. Urine is sterile, so safe to handle, or you can pipe the urine to a soakaway outside the building. A typical soakaway could be 4 meters long, 500mm wide, 500mm deep and filled with rubble or large (40-50mm) stone.

Maintenance and emptying

Once per week the toilet operator needs to open the access hatch and inspect the compost chamber. They should add an appropriate quantity of soak if necessary . If there's a large 'peak' accumulating under the pedestal they should level it by raking forward.

Emptying the composting may be an annual procedure. For a completely odour-free toilet the access hatch can be situated inside the toilet cubicles because this protects against smells from back-drafts. However, this can make removing compost slightly more awkward than with access hatches on the outside of the building.

Further Information

Low Impact Living book **Compost Toilets: a practical, DIY guide**, which has lots of advice on installing and using composting toilets.