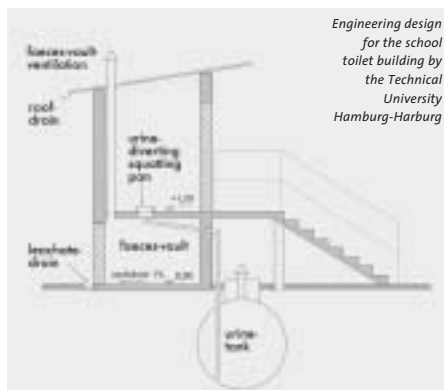




Dry urine diverting toilet building for the school in a Romanian village



Engineering design for the school toilet building by the Technical University Hamburg-Harburg

Ecological Sanitation or ECOSAN

What makes urine diverting toilets special?

Urine diverting toilets do not mix urine and faeces

Both materials are collected separately and treated adequately. This is possible by the use of a “no mix” toilet. Urine is collected and stored in a reservoir. Faeces are collected in a chamber or bucket and directly covered with dry material e.g. a mixture of dry ashes or lime and soil or woodchips. The faeces must be kept as dry as possible.

Are dry urine diverting toilets safe?

Composting kills faecal bacteria

There are always high amounts of bacteria in faecal material. Storing the faeces for at least one year and composting them will kill the bacteria (sanitisation). In areas with cold winters, a longer composting time is needed than in warm climates. However, since each person only ‘produces’ 50 kg of faeces per year this long time period does not require a lot of space.

Urine storage for six months removes bacteria

The urine of a healthy person is sterile. However, we are all ill sometimes in our life. Therefore, to be safe, the urine is first stored. For households a storage time of one month is suggested, but is not necessary if urine is used in one’s garden. For public toilets, storage of urine for at least 6 months is required, which removes low concentrations of micro pollutants.

Using ecosan products in agriculture

Urine is an excellent fertiliser

Urine is rich in nitrogen, phosphorus, potassium and other nutrients and can be used as a fertiliser in agriculture and horticulture. The urine collected from one person during one day is enough to fertilise one-square meter of land, and the urine of 30 persons, collected during one year can fertilise one hectare (10,000 square meters) of land. In cases of high nitrogen demand more urine can be given in several applications. Before sowing or planting, urine can be applied undiluted on the soil. Once the crops are growing, urine diluted with water can be used to fertilize the soil, approximately 1 part urine to 3 parts water. The urine mixture should be poured directly into the soil and not on the leaves, fruits or stems.

Composted material is a good humus (compost)

The composted faecal material is an excellent soil conditioner and can be mixed or covered with soil prior to sowing or planting. It is rich in phosphorus, potassium and organic matter. The best results are obtained when 1 – 2 litres of compost are applied on 1 square meter of soil.

Health precautions

Keep a large safety margin

To be completely sure to avoid any contact with faecal bacteria, apply these 3 rules:

- Do not apply urine or compost on vegetables, which are supposed to be eaten raw.
- Do not apply urine or compost one month or less before harvesting.
- Wash your hands after application or after handling with the toilet or its products.

ECOSAN a New Sanitation Approach

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On average 1 person produces annually: 50 litres of faeces 500 litres of urine

1 water flush toilet uses annually: 12,000 litres water for flushing these 550 litres of faeces and urine



An ecosan toilet is environmentally friendly and saves costs

An ecosan toilet is a high-quality solution in particular for places without drinking water or without a sewage system. Ecosan toilets do not necessarily need any water for flushing. They collect the faecal materials and urine and transform and them into safe fertiliser and soil conditioners. Contrary to pit latrines and septic reservoirs, which are often not emptied regularly, urine and faeces cannot enter the soil and pollute the ground water. Additionally, there are large amounts of valuable nutrients in urine like nitrogen, phosphorus and potassium, which can be re-used by collecting the urine separately.

Advantages of Ecosan

over conventional latrines or flush toilets

The benefits of dry urine diverting toilets

The benefits of dry urine diverting ecosan toilets are their high quality and comfort, which is similar to water flush toilets. Because of the separation system, the ecosan toilets do not smell and do not attract flies. Consequently ecosan toilets can be built inside homes where it is warm and comfortable. Furthermore, ecosan toilets are cheaper to build than water-flush toilets. They do not need a connection to a water supply and sewage system and do not need pumps to supply water for flushing.



Urine is an excellent fertiliser. Composted faeces are excellent soil conditioners.



There are many types of ecosan toilets

Ecosan toilets exist for all types of habitat, for villages and cities, for one-level houses and apartment buildings. Ecosan toilets can be built outside the house as well as inside since they do not smell. There are squatting and sitting ecosan models as well as models which use little water to flush or which use no water at all for flushing.

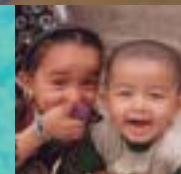
- Indoors
- Outdoors
- Sitting
- Squatting
- Without water flush
- With low water flush



Children are pleased using the new ecosan toilets (top photo)

Gender aspects

Women and girls suffer more from inadequate sanitation than men and boys. Surveys show that a lack of toilets in schools are a main reason for girls not to attend school. In cold climates the advantage of toilets built inside schools, as is possible with eco-sanitation, is that they benefit, in particular, girls by reducing the risk of bladder infections. Also the risk of sexual harassment is reduced.



Benefits of ecosan toilets

- ✓ Offer a high level of comfort and hygiene even when there is no central sewage system
- ✓ Do not smell or attract flies
- ✓ Do not use water for flushing
- ✓ Do not need a connection to water supply and sewerage
- ✓ Do not pollute groundwater like latrines do
- ✓ Do not pollute rivers, lakes or the sea with micro pollutants and nutrients, as do wastewater treatment plants
- ✓ Produce excellent fertiliser and soil conditioner
- ✓ Preserve nutrients
- ✓ Can be built inside (warm in winter, more privacy)
- ✓ Do not need electricity for water pumps
- ✓ Are less expensive to build and maintain than water flush toilets
- ✓ Save money