



# Small Composting Toilets

## Fact Sheet

Small composting toilets such as the BioLet and the Sun-Mar can accommodate one or two people on a continuous basis, or more people on a seasonal or weekend basis. I advise prospective owners of these units to take the companies' "usage levels" or capacities with many grains of salt. The advantages of these systems are that they can help small houses with failing septic systems, can fit in or under most bathrooms, and cost less than large tank composting toilets. Unlike the larger systems, the BioLet and Sun-Mar usually employ heating elements that run continuously to dry out the waste materials. They do not create a true compost end product and require significant maintenance and tinkering to work properly.

### **BioLet**

The BioLet unit sifts dried waste into a removable collection tray, separating the dried from fresh material. Rotating blades powered by a motor turn the compost periodically. A heater with an adjustable thermostat and fan warm the pile and remove odors.

The BioLet's distinguishing feature is a pressurized air-recirculating mechanism, which draws reheated air through the waste chamber and exhausts moist air through a ventilation pipe, evaporating liquid and warming the compost. Finished material needs to be removed roughly every three weeks, depending on usage. A non-electric system is also available.

Fluid level can be viewed in the BioLet through clear plastic tubes located at the base of the unit. Excess fluid built up should be drained off or emptied before emptying the trays of compost. Emptying liquid is, unfortunately, rather difficult as these drain lines are so near to the ground that only a shallow tray can receive the fluid. One option is to extend the fluid lines, complete with a 'trap', through a wall or floor to a container or leach field below the toilet. Be aware that adding this leachate to a septic or greywater system can cause regulatory problems.

### **SunMar**

The SunMar has a tank, generally located in a room beneath the bathroom, that operates using three chambers. Each chamber performs a separate function. Waste materials first enter the composting chamber, which is a rotating drum. The addition of a cupful of 'bulking agent' with each use and the rotation of the waste using a hand-turned (or motorized) crank help to speed the waste's drying and decomposition. The drum should be turned every three days. Excess liquids drain through a screen so that solid wastes are kept dry.

When the chamber is 3/4 full, approximately 1/3 of the chamber's contents are emptied with a counter-clockwise turn of the crank into another chamber, known as the compost finishing drawer. Here, solid wastes are isolated and 'finished'. The drawer is removed and emptied when the first chamber, the composting drum, becomes full.

In the evaporating chamber, which contains the separated liquids, air is drawn in and flows over the surface of the collected liquids before exiting the unit through a vent pipe. A partial vacuum ensures

that odors are contained. Most Sun-Mar toilets have a heating unit below the evaporating chamber, which accelerates evaporation. All models come equipped with a safety drain, which can be used to empty excess fluids when the system is overloaded.

The Sun-Mar advertises the possibility of using a micro-flush Sealand toilet with their units. My past experience shows this practice to cause major messes and headaches for homeowners.

### **Disadvantages of Small Composting Toilets**

These models have a number of moving parts that occasionally fail. If the fan dies, for example, or the electricity goes out, odors may fill your house. Motors can burn out and shear pins on mixing mechanisms or drum rotators can break.

Small composters require significant maintenance in the form of daily additions of a dry bulking agent, and regular emptyings of the dry, partially composted waste. This can be an unpleasant task. The frequency of emptying of the finished material depends on the ratio of the size of the unit's composting chamber to the number of people using it.

Fluids (urine) can be a problem, especially during parties or other 'surge' events - exactly when you DON'T want problems with your toilet. Units with large evaporators can sometimes result in the build-up of salt on the inside of the unit, and the need to remove that salt by dissolving it. Most commonly, excess fluid has to be dealt with via alternate means, especially during periods of over-use. These units are not a 'flush and forget' technology -- they require attention and maintenance.

Non electric (NE) units are available, but require significantly more maintenance and are messier than the models with heating elements. The NE's work best when used in a heated space above 75°F and have a means to deal with the excess fluids quickly and easily.

### **Electrical Usage**

Electrical requirements vary from unit to unit depending on the size and number of heating elements. The range is 0 watts for the NE models to 525 watts for the larger units with two heating elements and a fan. An average unit will increase an electrical bill about \$80 per year for an average family of three. Note that the electricity required to operate these small composters has an environmental cost associated with it in the form of pollution from the energy plant, which could be coal, oil or nuclear. If your primary objective is to offset pollution to a nearby stream or lake or your groundwater, you might want to weigh these 'externalized' energy costs in your decision.

Installation costs for these units vary, depending on the specifics of the situation, and can run from \$300 to \$700. A handy person can often install one themselves, the biggest issue being installing a vent stack through the roof and weatherizing it.

Many accessories are sold separately, such as a 12-Volt solar electric systems to power the fan, compost activator, bulking agent to add to the composting toilet, etc.