

ECOLET NE (SEPARERA) 30

The EcoLet is a biological composting toilet that uses the process of evaporation and aerobic decomposition to transform human faecal waste, urine and toilet paper to a hygienically safe product (humus) that may be safely utilised if disposed of in a manner described in this manual or by local health authorities.



Thank you for your purchase of an EcoLet Composting Toilet. With proper installation and maintenance, we are certain it will offer you a convenience and reliability you would expect from the manufacturer of the world's best selling septic free toilet. Please read these instructions carefully as they will give you vital information about installing and maintaining your EcoLet.

Specifications

Capacity:	2 person full time use 4 person part time use.
Max Weight:	158kg
Material:	ABS
Dimension:	740 L x 400 W x 635 H

Electrical Requirements

Operating Temperature:	Subject to ambient temperature
Key Feature:	Urine Separation
Ventilation Fan:	2.6W 12V DC 240V AC or 12VDC required

Go Green | Pay Less | No Mess

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1.0 PACKAGE CONTENTS

Please ensure that the package you received contains all items listed in the packing list document no. F-228 that comes with your EcoLet package.

If anything is missing, please contact your supplier immediately.

ITEM	QUANTITY
Pedestal	1
Chamber	2
Urine bowl diverter	1
12V DC fan c/w transformer	1
15 litre bag of humus starter	1
25mm drain hose	1.5m
Drain Clamp	1 (1 extra only for rear drainage configuration)
Hose Barb	1 (only for rear drainage configuration)
Screws	4
Long spacers	2
Short spacers	2
Washers	2
125ml Nature Flush Enzymes	1
Ventilation and drain kit	Optional
50 litre bags	1 roll



Figure 1: Package content.

2.0 INSTALLATION

This section outlines the requirements and procedures to ensure trouble free installation. Please follow the instructions exactly and contact Clivus Multrum for any installation questions.

2.1 Tools Required

- I. Drill
- II. Hole Saw 25mm & 57mm.
- III. Hand Saw
- IV. Screwdriver
- V. Tape Measure
- VI. 100% Silicon Adhesive Sealant with Caulking Gun
- VII. Pencil
- VIII. Spirit Level
- IX. Spade

2.2 Materials Required

- I. 50mm DWV PVC pipe and fittings for ventilation pipe depending on installation requirements.
- II. 50mm vent pipe supports and wall or roof flashing depending on installation requirements.
- III. PVC pipe glue.
- IV. Drain kit or excess fluid container if not purchased from Clivus Multrum.

2.3 Pedestal Installation

The EcoLet can be installed close to a wall with the vent pipe exiting directly through the rear wall or alternatively the vent pipe can be installed on the inside exiting up through the ceiling (Figure 2).

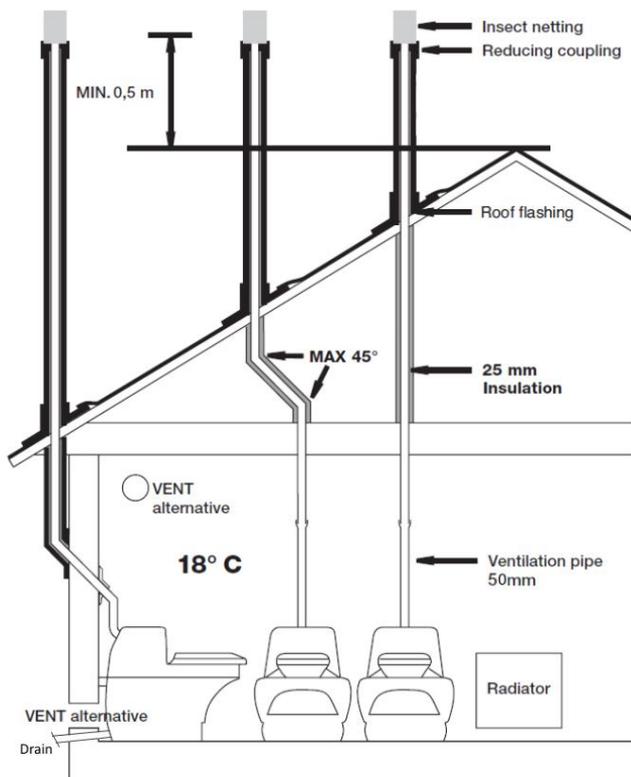


Figure 2: Ventilation pipe installed Outside.

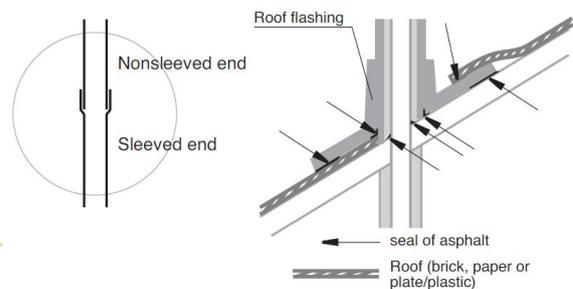


Figure 3: Roof flashing installation.

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2.0 INSTALLATION

The following instructions relate to Figure 2 and Figure 3. These are recommended installation procedures but may vary depending on the location.

1. Unpack the unit and remove all contents from the pedestal.
2. Position the unit 60mm out from the wall due to vent pipe exiting from rear.
3. Mark vent pipes and drain outlets. Please note that your EcoLet Separera drain outlet can be at the rear or base depending on your preference made when purchasing the unit from Clivus Multrum (shown in Figure 4).
4. 57mm and 25mm hole saws are required for vent pipe and drain outlet respectively.
5. If your unit has rear drain outlet, drill hole through wall using the 25mm hole saw.
6. Connect and affix the drain hose to drain outlet using the clamp supplied.
7. If your unit is to be drained through floor, drill hole through the protruding circle located at Ecolet Separera floor as shown in Figure 5.
8. Also drill 25mm hole through floor at the drain outlet position marked earlier.
9. Connect and affix the drain hose to the urine bowl diverter outlet using the clamp supplied and run the hose down through the floor drain outlet drilled.
10. Use 57mm hole saw, drill hole through wall and install vent pipe. Ensure no more than 2x 45° or 30° elbows being used.
11. Slide roof flashing over ventilation pipe and seal. Vent pipe must be extended at least 0.5m above roof and braced against wind.
12. Adjust flashing and use roof sealant (silicone) to seal roof and flashing as shown in Figure 3.
13. Secure insect mesh on top of the vent pipe.

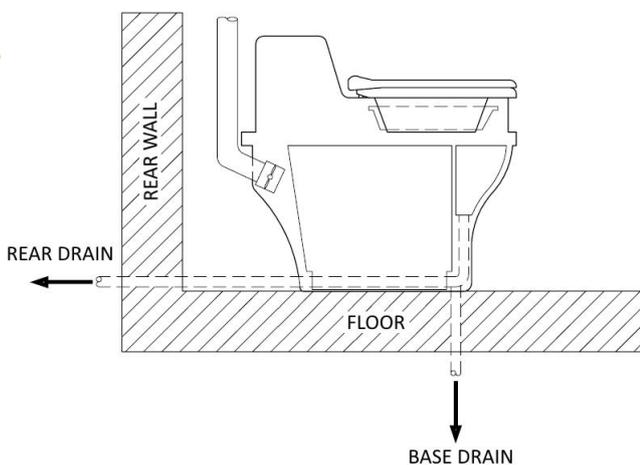


Figure 4: Rear wall or base drain configurations



Figure 5: Protruded circular guide for base drain.

2.0 INSTALLATION

2.4 Excess Liquid Drain Installation

The drainage system chosen depends entirely on the soil condition, ground water level, and local regulations.

2.4.1 Absorption Trench

This is the normal method of excess liquid disposal, however, you should refer to council permits for any specific requirements. These instructions apply to installation of the drain kit items available from Clivus Multrum.

1. Dig a trench in a position located in front of the liquid end product drain.
2. The trench is to be located in soil of good permeability and in a position where ground water will not flood the unit.
3. If there is some doubt as to the permeability of soil, extra trenching length may be required especially if a hand basin or other fittings will also drain to the same trench.
4. The liquid leaving the compost unit when in use is not expected to exceed 1 litre per day per resident.
5. In some locations it may be desirable or necessary to connect the excess liquid drain to a grey water system or an alternative disposal method complying with AS/NZS 1547:2012.

Trench dimensions and construction are to be in accordance with AS/NZS 1547:2012, as shown in Figure 4.

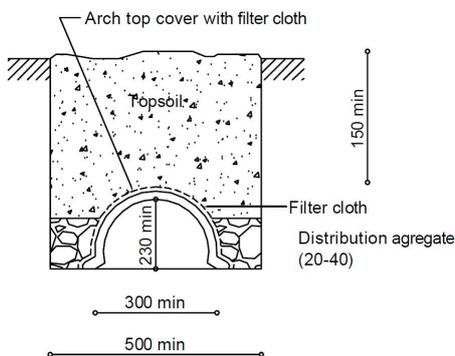


Figure 6: Durable self supporting arch trench. Dimensions in mm.

It is important to ensure that the trench is level along its length. Ensure the liquid drain pipe slopes away from the toilet. The trench should be protected from surface water, flooding and vehicle traffic.

2.4.2 Option II—25 Litre Translucent Container

This option is for installation in areas with high ground water level, poor permeability or rocks.

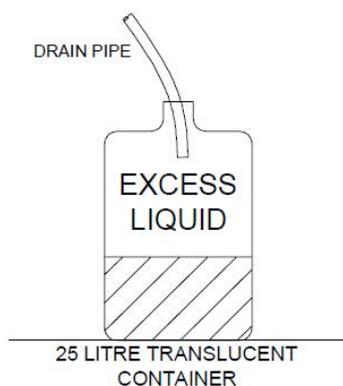


Figure 7: Translucent Container 25 Litre Capacity

Excess liquid can be drained into the container. This container must be emptied at least every three days. When filled, remove and dilute 1:4 with water and use as fertiliser.

3.0 USING THE ECOLET

3.1 Initial Setup

1. Remove top of pedestal. Ensure compost chamber is placed inside the pedestal.
2. Connect the power outlet for the ventilation fan to power socket.
3. Add 5 litres of wood shavings into the compost chamber.
4. Replace the top of pedestal and EcoLet is ready to be used!

4.0 MAINTENANCE

4.1 General Care

The EcoLet should be examined regularly to ensure correct operation. The key areas to be checked are listed below:

- Wash the urine diverter bowl from time to time using hot water to prevent salt deposits.
- Check ventilation fan is running.
- Check there is no excess liquid in the compost chamber and pedestal. Refer to Section 7.0 for troubleshooting.

4.2 Removing The Solid Waste

With normal use, a family of four produces around 7 litres of solid waste per week. To create compost that is nice and loose, add a few litres of Special Humus once a week.

You need to base the emptying frequency on how often the toilet is used and by how many people. For example, after 4-6 weeks' use by 4 people it will be time to switch composting chambers. Lift out the inner container and carry it out, add a little ordinary topsoil and put the lid on. Place the container in a shady place in the garden for post-composting. It takes 6 to 9 months of post-composting as a rule before the contents can be used a fertiliser.

Put a latrine bag in the other inner compost chamber and place them in the pedestal.

4.3 How Do I Dispose The Composted End Product?

Clivus Multrum recommends wearing protective clothing whenever handling waste products. Recommended protective clothing includes gloves, appropriate footwear, a face mask and ideally eye protection.

You should dispose of the composted waste in accordance with any and all local authority regulations. All composted product should be handled and treated with caution as there is a risk of exposure to pathogens particularly if the product is not properly composted.

On-site burials of composted end product should be undertaken in a location where direct access by humans and animals is restricted. It should be buried with a minimum cover of 100mm-300mm, depending on local authorities, in soil that is not intended to be used for the cultivation of root vegetables or near a water catchment area.

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4.0 MAINTENANCE

4.4 Adding Bulking Material

It is important to add bulking material into your toilet, we suggest 1 cup per day directly into the compost chamber. This amount is based on two people using the system full time.

By mixing the solid waste, paper and bulking material, the compost will be kept porous and moist and the supply of oxygen will increase, substantially accelerating the transformation of waste materials into humus.

Bulking material: Wood Shavings or Chopped Straws

4.5 Insects

If insects have entered into your compost, you should sprinkle an insect control powder or any other long lasting pyrethrum based product over the compost chamber.

4.6 Cleaning

Use mild detergents on your EcoLet. Never use scouring powder or other strong detergents that could scratch the surface, or kill off your good bacteria. We recommend green friendly or septic safe products.

4.7 Warning

Never put cigarettes or other burning material, tampons or sanitary napkins into your toilet!

5.0 HOW COMPOSTING WORKS

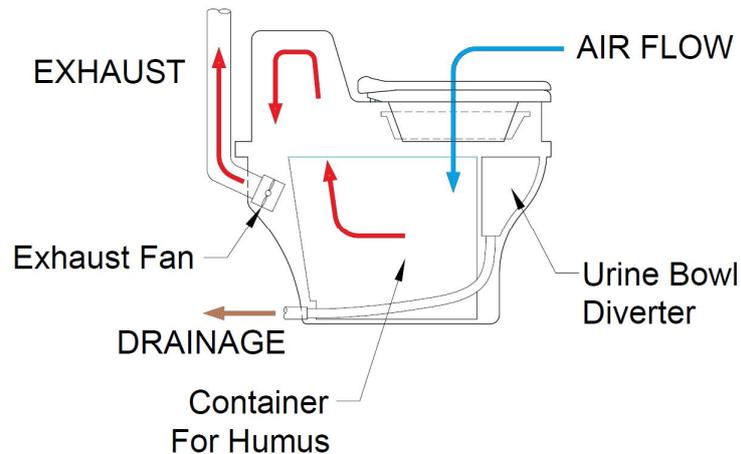


Figure 8: How EcoLet Separera 30 works.

5.1 General

Composting involves the biological decomposition of organic matter using naturally occurring organisms such as bacteria, fungi and other small organisms into compost, which is a humus-like product.

The composting process can be aerobic or anaerobic however, aerobic decomposition is desirable because it is efficient and does not produce unpleasant odours. Composting in a EcoLet is generally aerobic, however, there may be anaerobic decomposition within small pockets of the compost pile.

The composting process involves four main components: microbes (including bacteria, fungi and protozoa), organic matter, water and oxygen.

The carbon compounds present in the organic materials are used by the microorganisms as an energy source and transformed into carbon dioxide using the oxygen present. As the carbon dioxide and water vapor is released into the environment the pile becomes smaller.

Nitrogen is also a crucial element in the composting process which is required by the microbes for cell growth. For optimal decomposition the ratio of carbon to nitrogen should be around 30:1. Urine and human faeces are relatively high in nitrogen and therefore additional carbon is required for optimal composting.

5.2 Moisture

In optimum conditions, the compost material has the consistency of potting mix, about 35% to 65% moisture.

When below 35%, there is not sufficient moisture for the microorganisms to function and above 70% saturated conditions begin to develop and oxygen depletion becomes a limiting factor. Under these conditions the process becomes anaerobic and the process releases odorous gases such as methane and hydrogen sulphide.

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5.0 HOW COMPOSTING WORKS

5.3 Temperature

The optimum temperature range for most composting toilets is 18°C to 45°C.

Lower temperatures result in a mouldering process, significantly increasing the composting time. Additional chambers may be required in this instance.

5.4 Aeration

The aerobic organisms responsible for the composting process require air to survive.

Without air, they will die and be replaced by anaerobic micro organisms that will slow the composting process and generate odour.

For composting toilets to work most effectively, the material being composted should be unsaturated with liquids, and have a loose texture to allow air to circulate freely within the pile.

5.5 Pathogens

Pathogens are eliminated through the long retention periods in the compost, the compost temperature and the activity of the micro-organisms.

6.0 WARRANTY

Pedestal:

- 2 years warranty.
- Any damage caused by exceeding the maximum recommended weight listed in the specifications would void your warranty.

Ventilation Fan

- 12 months limited warranty.
- Powering the fan with an unregulated power source exceeding 12V or using a power supply not recommended by Clivus Multrum would void your warranty.
- Any faulty fan during the warranty period should be returned to Clivus Multrum before a replacement can be provided.

All other components come with standard 12 months warranty.

7.0 TROUBLESHOOTING

A. Why is the compost chamber **filling** too quickly?

A number of issues can limit the efficacy of the composting process and result in the composting chamber filling too quickly, a few possibilities are listed below:

Insufficient air flow—Without sufficient air flow, the evaporation process will be slowed and odours start to escape into the toilet room. This can be caused by a malfunctioning fan or the ventilation system being blocked. Check if the fan is properly connected or replace the fan if broken. Check if the insect netting has been blocked.

B. Why is the composting process slow to complete?

Composting process is dependent on temperature and humidity. Listed below are factors that could slow down the process:

Compost pile being too wet—The addition of wood shavings is an imperative part of the operation of a composting toilet. Wood shavings will assist with the absorption of liquid in your composting toilet and will aid in improving the carbon/nitrogen ratio (important for composting). It will also allow air to flow more freely through the system as it loosens the compost pile.

Compost pile surrounding temperature is too low—In cool climates do not insulate the toilet; turn down the fan voltage to lessen cool air being drawn into the system. If odour occurs due to the fan voltage being turned down low simply turn it up slightly to increase airflow.

When taking the compost chamber out for secondary composting, make sure it is located in a warm spot preferably in direct sunlight.

C. How to deal with insects attracted to compost pile?

Usually insects in the compost pile indicates that the humus is too dry. Add a cup of water to the compost.

Insect Control—To break the breeding cycle of insects (most commonly vinegar flies) spray the compost pile with pyrethrum based insect spray for 7 consecutive days. Always place a layer of wood shavings over the top of the pile in the out of service chamber to eliminate the possibility of insects laying eggs.