

## Zero Energy Sewage Treatment Plants

## Owner's Manual & Installation Guide

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### Ecoflo Coco-Filter, Ecoprocess

Standard Discharge consent:  
20mgBOD5/l 30mgSS/l 20mgNH3-N/l

### Manual Version OMI008 Rev 6

Created On: June 2022



**Installers: To Safeguard Warranty Please  
Ensure You Are Using The Latest  
Installation Manual**

## Customer Checklist

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Complete Installation Record



Page 4

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Register Your Warranty



**10**  
Year

Page 5

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See Maintenance Schedule



Page 6–7

Familiarise Yourself With This  
Manual



Page 8>

## Installation Record

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Please record details of your Ecoflo tank installation here and keep this document in a safe place.

Serial Number:

Commissioning

Date:

### Commissioning Company

Name: -----

Address: -----

-----

Contact: -----

### Service Company

Name: -----

Address: -----

-----

Contact: -----

If you require assistance finding a service company, please contact Premier Tech. Your warranty is invalidated if you do not keep to a regular servicing schedule.

**PT Water and Environment  
Ireland**

Quartertown Industrial Estate  
Mallow  
County Cork  
IRELAND  
P51 PY20

+353 (0) 22 51411  
[sales.ptwe.ie@premiertech.com](mailto:sales.ptwe.ie@premiertech.com)  
[Premiertechnaqua.com/en-ie](http://Premiertechnaqua.com/en-ie)





# WARRANTY

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Thank you for purchasing a Premier Tech product.

## 10 Year Warranty

To activate your warranty complete the form below to  
receive your warranty certificate by email:

[https://www.premiertechaqua.com/en-  
ie/warranty-activation](https://www.premiertechaqua.com/en-ie/warranty-activation)



- Your Ecoflo treatment plant is supplied with a 10-year Parts and Workmanship guarantee.
- This warranty is dependent upon the plant being installed, operated and maintained in accordance with this Installation, Operation and Maintenance manual.
- Proof of correct installation and plant maintenance (servicing) including purchase of serviceable parts **MUST** be retained, as these will be required in the event of any warranty claim.

Failure to comply with the above Terms and Conditions will invalidate the warranty.

Premier Tech Water & Environment Ireland accepts no liability for any damage or loss, including consequential loss, caused by the failure of any equipment supplied.

## Ecoflo Maintenance Schedule

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Details of servicing & maintenance requirements are located within this manual. Please use this page to record your tanks services and maintenance.

Your warranty is invalidated if you do not keep to a regular servicing schedule.

**6 Month Check**

Date:

Servicing Company:

Notes:

**1<sup>st</sup> Annual Service**

Date:

Servicing Company:

Notes:

**2<sup>nd</sup> Annual Service**

Date:

Servicing Company:

Notes:

**3<sup>rd</sup> Annual Service**

Date:

Servicing Company:

Notes:

**4<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

**5<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

**6<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

**7<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

## Ecoflo Maintenance Schedule

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**8<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

**9<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

**10<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

**11<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

**12<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

**13<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

**14<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

**15<sup>th</sup> Annual Service**

Date:

Servicing Company:

Notes:

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# Regulations & Responsibilities

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A package sewage treatment plant is an essential component of the home or workplace. It provides safe and hygienic wastewater treatment and disposal to make sure your family and colleagues have a pleasant place to live and work and that the local community and environment are protected.

You must treat your package sewage treatment plant with the respect it deserves and make sure it is operated and maintained properly so it can continue to provide outstanding performance.

## 1.1. Building Regulations

Notices are required to be displayed in the household stating that the plant is connected to a private sewage treatment plant. Notices in toilets and bathrooms would also inform guests.

Planning and building control departments of your local council should be informed of the work being undertaken.

### 1.2. User's responsibilities

Users of a packaged treatment plant have a responsibility under the terms of the Water Resources Act (1991) to ensure that the plant meets the standards set by the Environment Agency. The plant is designed to ensure that the final effluent discharged back into the water table (Ground Water) or watercourse meets these requirements. Once your plant is commissioned and operating efficiently, the Environment Agency may sample the discharge from the plant to check it meets the agreed standards. The Environment Agency also has the right to alter the consent standard. It is essential to regularly maintain and service the plant to make sure it is running efficiently. You can do a lot to ensure you get the best out of your plant. This manual offers a simple and practical guide to help you do just that.

The plant must be emptied/raked of as required by the operating instructions, ensuring that the tanker company used is licensed as required to dispose of the waste. All documentation relating to the sludge disposal is to be kept with the servicing records.

The plant must be serviced in accordance with the requirements as set out in this Operation and Maintenance manual; failure to do so will invalidate any warranties associated with the plant and its ancillary equipment.

An appropriate approved service provider must carry out the annual service. The consent holder must keep records of all services undertaken; these will be requested in the event of a warranty claim.

When a house is sold, evidence that the treatment plant has been properly installed and maintained must be passed onto the purchaser.

## 2. Introduction

This Installation, Operation and Maintenance (O&M) manual includes descriptive literature, specifications and drawings relating to the principal equipment incorporated in the unit. It is the responsibility of the installer and operator to read and fully understand these instructions before installing, commissioning or operating the plant. In the unlikely event of problems occurring with your plant you may either refer to this manual, your equipment supplier or directly to Premier Tech Aqua Limited.

The plant comprises two treatment stages; a primary settlement stage and a coconut fragments based filter combining aerobic biological treatment and solids removal zone. The design combines the benefits of a well-proven treatment process with our engineering expertise to produce a high-quality system, which is robust and reliable. The plant will provide long and trouble free operation, providing the simple maintenance procedures described out in this manual are regularly carried out.

Your attention is drawn to the 'Health and Safety' section at the beginning of this manual. It is IMPERATIVE that you read these instructions BEFORE working on the plant.

The plant has been designed to treat the volume and strength of sewage specified in the original quotation. Please note the following points:

- The maximum design loadings must not be exceeded (see original quotation and order acknowledgement for details).
- The plant is designed for gravity feed and should not be pumped to. When required, a pump can be installed at the outlet of the septic tank to feed the filter.
- Surface water, from roofs etc., must not enter the plant and or sewerage system.
- High volume discharges from swimming pools or Jacuzzi's must not enter the plant.
- Large quantities of chemicals such as water softener regenerant, disinfectants, strong acids or alkalis, oil and grease, pesticides or photographic chemicals must not enter the system.
- Do not use chemical or biological emulsifiers in grease traps.
- Do not dispose of nappies, baby wipes, sanitary towels, incontinence pads or similar materials via the toilet.
- Do not dispose of medicines down the toilet or sink
- Waste disposal units should not be used unless accounted for within the original specification

If you have any doubt of an entering substance, please contact Premier Tech Aqua.

### 3. Health and Safety

Important – Please Read This Before Starting Any Work on the Plant

1. The appropriate sections of the Health & Safety Authority manual must be read before working on the equipment.
2. Suitably trained or qualified personnel must carry out installation and servicing.
3. Normal safety precautions must be taken and appropriate procedures observed to avoid accidents. Refer to Premier Tech or your local supplier for technical advice or product information. It is the customer's responsibility to ensure that all necessary health and safety control measures as well as suitable protective clothing / equipment is available.

Leptospirosis – what is Leptospirosis and are you at risk?

Two types of Leptospirosis infection affect people.

1. Weils Disease – this is a serious and sometimes fatal infection that is transmitted to humans by contact with soil, water or sewage contaminated with urine from infected animals such as rats.
2. Hardjo-type Leptospirosis – this is transmitted from cattle to humans. What are the symptoms?

Both diseases start with a flu-like illness with a persistent and severe headache, muscle pains and vomiting. Jaundice appears about the fourth day of the illness.

How might I catch it?

The bacteria can enter the body via cuts and scratches and through the lining of the mouth and throat or through the eyes.

How can I prevent it?

After having worked in contact with sewage or anything contaminated with sewage, wash your hands and forearms thoroughly with soap and water. If your clothes, boots or tools are contaminated with sewage, wash thoroughly after handling them.

Take immediate action to wash thoroughly any cut, scratch or abrasion of the skin as soon as possible. Apply antiseptic to the wound, cover with cotton wool or gauze, and protect with a waterproof plaster.

DO NOT handle food, drink or smoking materials without first washing your hands.

If you contract the symptoms described above after coming into contact with sewage, report it to your doctor immediately and advise him/her of the circumstances.

## Sewer Gases

Sewage gases are potentially hazardous; it will be necessary to enter the filter part of the treatment system annually to perform routine maintenance. Take suitable precautions including venting of the filter unit and the use of suitable personal protection equipment when entering the unit for maintenance purposes.

Where the filter is in shallow excavations, simple ventilation for a period of time before commencing the works in combination with suitable PPE, will be adequate.

Where the filter is installed at depth, the space may be considered as a Confined Space and the use of a ventilator in combination with ventilation and suitable PPE may be required subject to site conditions.

DO NOT enter the primary (septic) tank associated with the treatment system.

DO NOT leave the access/manhole covers to the plant open for any longer than is necessary.

Temporary barriers and warning signs should be erected around any open covers or manways as appropriate.

## 4. Operational Responsibility

The owner of the Sewage Treatment Plant is entirely responsible for plant operation and ensuring that the effluent quality does not breach the applicable Discharge Consent Standards.

The offloading of the treatment plant and the correct installation is the responsibility of the owner. It is strongly recommended that a contractor with an adequate understanding of drainage and sewer systems should install the plant.

Determination of the method for the final disposal of treated effluent remains the responsibility of the client and should be agreed in consultation with the relevant Environment Agency or Local Authority.

Premier Tech Water & Environment is not responsible for the design of the final effluent disposal system for example headwall discharge to a water course or drainage field design. The responsibility for the design, installation and maintenance of the treated effluent final disposal system remains with the client.

Premier Tech Water & Environment accepts no liability for any damage or loss, including consequential loss, caused by the failure of any equipment supplied.

## 5. Treatment Process

### 5.1. Overview

The ECOFLO® range of zero energy treatment plants comprise of a two-tank system: a septic tank for primary settlement followed by the coconut based filter (biological treatment/filtration), both treatment stages are contained within a high-density polyethylene (HDPE) tank. The flow through the plant can be by gravity where site topography and conditions allow or a water lift can be incorporated within the design where site conditions require it (scheme: PD0004 GE ECO SCHEME Rev 1 061117).

### 5.2. Primary Settlement Stage

The incoming wastewater is received in the primary settlement tank equipped with an effluent filter at the outlet. The purpose of this first stage is to remove most the settleable material and to retain floating matter, thus reducing the biological load to be treated and avoiding clogging of the coco fragment based filtering media. Flow from the primary tank passes forward into the biological treatment zone.

Primary treatment is an essential step in treatment process. Raw wastewater contains high concentrations of solids and/or floating matter that are not easily biodegradable, such as oil and grease. If this matter reaches the treatment system, its lifespan and potentially treatment efficiency will be greatly reduced.

### 5.3. Biological Treatment / Filtration Stage

The primary settled effluent flows into a tipping bucket mechanism that alternatively transfers flow onto two distribution plates. These plates evenly spread the effluent over the surface of the coco filtering media where the effluent then trickles downwards through the filtering bed. The combination of the extremely high surface area and open structure of the coco media promotes the growth of bacteria and micro-organisms which treat the wastewater.

The coco media retains and degrades the pollutants treating the waste water to an extremely high quality leading to a low potency treated effluent being discharged from the base of the plant.

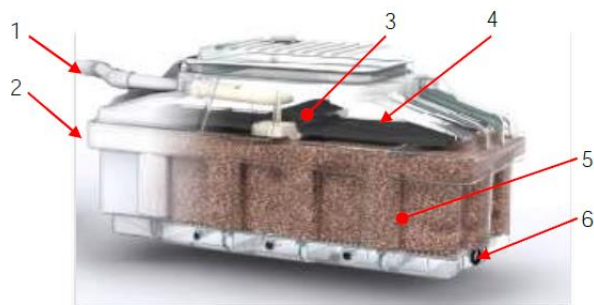
The air required for the treatment process is introduced into the plant through a patented natural ventilation system meaning that no forced air ventilation is required therefore no energy is required for the biological treatment process.

Air enters the system through the air ducts on the lid of the primary access. The fittings in the filter section of the plant allow the air to circulate between the top and the bottom of the filter media. Air circulates through the system by convection from the soil vent stack on the connected building(s) (or via a separate vent) through the inlet pipe and the primary settlement chamber.

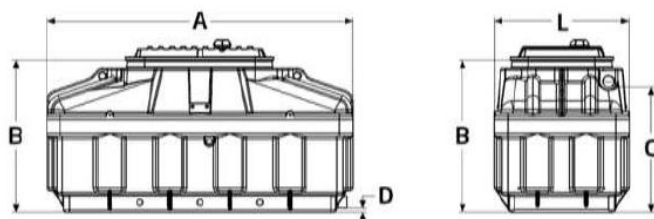
## 6. Plant description

### 6.1. Ecoflo® FILTER

The Ecoflo® Filter operating principle allows the system to be used continuously or intermittently without requiring any special precautions or having any impact on the quality of the treatment.



1. Inlet, flow from the septic tank
2. Biological filter chamber
3. Tipping bucket
4. Distribution plate (typical)
5. Coco husk media
6. Effluent exiting the plant



ECOFLO® Filter		4PE	6PE
A	Overall Length (mm)	2420	3320
B	Overall Height to ground (mm)	1360	1360
L	Overall Width (mm)	1210	1210
	Inlet / Outlet Pipe Diameter (mm)	110	110
C	Standard Inlet Invert (mm)	1120	1120
D	Standard Outlet Invert (mm)	30	30

#### 6.1.1. Components

#### Access Covers:

- Protect the accesses to the tanks
- Allow access to the inside of the system and to the components for inspection and maintenance
- For the filter tank: provides air for the filtering media (through the air intakes in the access to the biological treatment/filtration stage)
- For the septic tank: inspection, effluent filter cleaning and desludging

#### Tank Shell:

- Contains the system components
- Allows connection of inlet and outlet pipes
- Assures air circulation

#### Central Support & Support Rails:

- Supports the tipping bucket and distribution plates

#### Tipping Bucket & Distribution Plates:

- Evenly distributes the wastewater on both sides of the filter media
- Creates the hydraulic events (flush) required for proper distribution of the wastewater on the distribution plates and promotes self-cleaning
- Allows the even distribution of the influent on the surface of the filter media

#### Filtering Media:

- Consists of a natural filtering media composed of fragments of coconut husks
- Acts as a support for the bacteria and micro-organisms that treat the wastewater
- Physically filters the solids contained in the influent
- Ensures adequate humidity required for biomass viability when there is no incoming wastewater

#### Collection zone for the treated effluent:

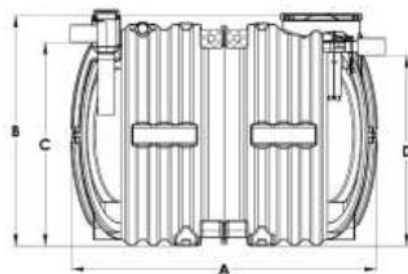
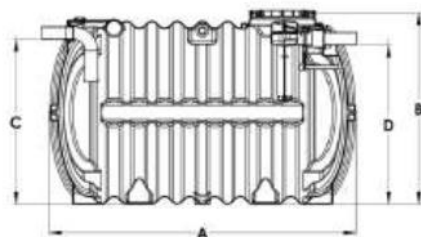
- Ensures draining of the treated effluent
- Ensures air circulation under the filter media

## 6.2. Rewatec Septic Tank in Reinforced and Super Reinforced Variants (Optional)



Mil 3m<sup>3</sup> 4m<sup>3</sup> &

Mil 6m<sup>3</sup> 8m<sup>3</sup> & 10m<sup>3</sup>



Model	A Length (m)	Width (m)	B Height (m)	C Inlet height to base (m)	D Outlet height to base (m)
3m <sup>3</sup>	2.42	1.47	1.50	1.30	1.27
4m <sup>3</sup>	2.47	1.66	1.70	1.50	1.48
5m <sup>3</sup>	2.48	1.89	1.89	1.68	1.65
6m <sup>3</sup>	2.67	2.08	2.11	1.87	1.75
8m <sup>3</sup>	3.36	2.08	2.11	1.87	1.75
10m <sup>3</sup>	4.05	2.08	2.11	1.87	1.75

### 6.3. Operating Instructions



Always comply with the advice of the local authorities but in general, the tank must be pumped out:

- When sludge has reached 50% of the tank's capacity by volume.
- At least once every year for all wastewater and septic tanks.
- Tanks must be pumped out at a steady pace, while simultaneously adding clear water.

The filter must be cleaned and rinsed at the same time.

#### **6.4. General Recommendations**

- Do not pump out septic tanks during periods of heavy rainfall.
- Septic tanks must be pumped out at a steady rate with clear water being added at the same time.
- These operations should be carried out by a certified, qualified professional who is trained and equipped for this type of work. Never smoke when removing caps during procedures (inspection, maintenance) (presence of H<sub>2</sub>S).
- Wear waterproof gloves to avoid skin contact during handling.
- Operations must be done during off-peak periods of the day to avoid any influx of effluent to the tank.
- Have a container and garden hose or pressure-washer on hand.
- After the procedure (inspection, maintenance) ensure correct function by flushing several tanks of water to the tank.

#### **6.5. Integrated filter (effluent filter\*):**

- During normal use, the integrated filter collects particles from the septic tank and can gradually become clogged. It must be cleaned regularly. We recommend yearly inspection of the filter and cleaning as necessary.
- Cleaning must be performed using a water jet, with the filter placed above the manhole so that waste falls back into the septic tank. The filter must be cleaned every time the septic tank is emptied.
- Maintenance frequency may vary depending on how the filter is used.
- If grease is stuck to the filter, place the filter in a waterproof container and wash with hot water (liquefaction).

#### **6.6. Cleaning the PURFLO PF 17 filter**

- Locate the septic tank's manhole.
- After unlocking the cover (1/4 turn), pull back the cover, signal that you are working and secure the perimeter.
- Make sure no water is flowing into the septic tank when the filter is removed for cleaning.
- Empty the tank partially or completely as necessary.
- Remove the filter completely, holding it upright and using the handle, until it is disconnected from the secured filter connector.
- Make sure that the van guillotine on the secured filter connector seals the tank outlet.
- Pull the plug out of the handle, position the garden hose fitting onto the filter hook up, connect the hose, hold the filter above the manhole, then turn on the water.
- With the water running at its highest volume, move the filter up and down repeatedly (vertically) to rinse the inside of the filter, so that waste falls back into the tank (\*male 20 x 27 fitting).
- Turn off the water, remove the hose, put the plug back into position on the handle, put the hose fitting back into its initial casing, put the filter back into its secured filter connector.

Push the filter and secured filter connector downwards until it stops.

- The secured filter connector van guillotine must have disengaged from the tank outlet.
- Put the cover back on and lock it (1/4 turn lock).

## 6.7. Troubleshooting

Saturation or clogging, non-liquefaction of material, please check:

- That only wastewater is entering the tank
- The various levels (grease, water, sludge)
- The date that the tank was last emptied, and how it was done
- For biological and chemical causes (i.e. unusual, excessive or constant disposal of harmful or non-biodegradable products like bleach, antibiotics, drain cleaners, etc.)
- The tank's dimensions (i.e. undersized parts, overload, etc.)

Spill over of non-degraded matter outside of a tank or filter clog, please check:

- The size of the device (i.e. device not large enough for regular use)
- The date the tank was last pumped out (i.e. not emptied often enough)
- If the rainwater drainage system is separate (i.e. rainwater is entering the tank)
- How often the filter is cleaned (clean it – if the filter contains filtering material, replace it)

Odours:

- That manhole covers and fittings for the tank inlet are waterproof
- That traps are effective (i.e. inadequate flow, clog)
- The upper section of the vent pipe (i.e. nominal  $\varnothing < 100\text{mm}$ , output below the roof line)
- That there is sufficient airflow in the tank above the scum (the layer of fat or scum is too thick, etc.)
- The indicators listed above as specific inspections

## 7. General Installation Instructions

**IMPORTANT! PLEASE READ HEALTH AND SAFETY INSTRUCTIONS BEFORE UNDERTAKING ANY WORK OR MAINTENANCE OPERATIONS.**

The following instructions are offered as guidance only. For site-specific installation requirements based on actual site conditions and the client/end-user should consult with a suitably experienced and qualified installation contractor and should retain the services of a suitable qualified professional.

- For further general information please refer to [www.britishwater.co.uk](http://www.britishwater.co.uk)
- Code of Practice Guide to the Installation of Small Wastewater Treatment Systems
- Code of Practice A Guide for Users of Small Wastewater Treatment Systems
- Code of Practice Guide to the Desludging of Small Wastewater Treatment Systems

### 7.1. Materials

It is strongly recommended that concrete and / or granular backfill materials are not ordered until the treatment plant is on site. PremierTech Aqua will not accept any level of liability for losses incurred by the unlikely event of a late delivery of the treatment plant.

### 7.2. Transportation

Tanks must be held down during transportation using nylon straps, do not use chains, cables or wire ropes to hold tanks.

Do not over tighten straps, causing deformation of the tank shell.

### 7.3. Offloading

- The contractor is responsible for offloading the tank and any accessories.
- DO NOT lift the tank if it contains any water, ensure tanks are empty before attempting to lift or move the tank.
- Lift the tank using webbing lifting straps do not use chains, cables or wire ropes in contact with the tank connected to the relevant tank lifting points.
- Maintain control over the tank when lifting by use of guide ropes. DO NOT allow the tank to impact against other objects.
- Move tanks only by lifting and setting, do not drag or roll. Do not drop or roll tanks from the delivery vehicle.
- If the tank is stored on site prior to installation, it must be upright on a flat and level ground where it cannot be punctured or otherwise damaged. Chock with

tyres or other cushioning material to prevent moving, and tie down if high winds are expected.

- Tanks may be lifted with other suitable site equipment; greater care is needed to control the lift and to ensure the tank is not damaged.

#### **7.4. Pre-Installation Inspection**

- Tanks should be subject to a visual inspection prior to installation. Check for any defects that could affect water tightness of the tanks.
- Any damage should be notified to the delivery driver and to Premier Tech Aqua.
- Do not undertake any unauthorized repairs, as this will invalidate the tank warranty.
- Check the invert depth is correct, where applicable the tank is the correct
- Grade for granular/concrete surround and that the inlet and outlet pipe orientations are correct.
- Where present, all fixings (nuts, bolts, screw fixings etc.) must be checked and retightened to correct any movement during transport. Premier Tech Aqua do not accept responsibility for fixings that have not been checked prior to the tanks entering service.

#### **7.5. Supplied items**

The general extent of supply is:

- (i) Treatment plant ready for installation (Rewatec Septic Tank and ECOFLO® Filter).
- (ii) Operation and Maintenance Manual this document.

See your delivery note for full details of items ordered.

#### **7.6. Loadings**

The tank must not be installed in an area where traffic or other superimposed loadings can be applied.

#### **7.7. Ventilation**

Before installing the tank, consideration must to be given on how to provide adequate ventilation across the plant. Each site is different therefore Premier Tech Aqua can only offer the following general advice as guidance. See the requirements of BS 8301, the requirements of the Building Regulations Section or consult a suitable qualified professional for more detail. All waste water services should have a venting discharge point through a soil and vent pipe/stack (SVP) at the upstream end of the treatment system; SVP is normally integrated into the buildings foul water drainage system.

The type and position of vents, as well as other factors unrelated to the treatment plant, can prevent gases from dispersing properly and lead to odours. Please consult a suitable experienced and qualified professional when design the foul drainage system,

this is especially important where there are older un-mapped drains serving a development. Premier Tech Water & Environment takes no responsibility for the design provision or maintenance of site ventilation services.

As the Ecoflo® treatment plant is an aerobic treatment process; it requires air to function properly. Under all conditions the discharge pipe from the plant, whether to a watercourse or a drainage field, must remain free draining i.e. an unrestricted outflow. If the water level in the plant backs up to the level of the filtering media, the performance and lifespan of the filtering media will be affected.

## 8. General Guidance

*During installation it is important to check that each tank in the treatment plant remains level across all planes throughout the installation. Mis-alignment of the tanks may impact on the treatment system performance and quality of the final effluent.*

- 1 The client/installer must determine the existence, or otherwise, of a water table taking into account the conditions at the time and any site investigation results. Excavate to the required tank dimensions allowing minimum clearances of 450mm between the tanks and 300 between the tanks and excavation walls allowing for shoring etc.
- 2 The base of each unit should sit on a firm levelled surface. This may mean creating a concrete base. **Important; the base should be level across all planes.** Care should be taken not to dig too deep a hole and where inadequate soil/bearing material is found in the excavation it should be removed and the void filled with lean mix concrete prior to pouring the concrete base.
- 3 Site conditions relating to the water table will dictate the installation type and tanks to be used. Site investigation should confirm the relevant site conditions prior to purchasing the primary settling tank.
- 4 The inlet/outlet invert levels and the tank dimensions will determine the depth of the excavation and the type of system installation; this should already be determined as part of the system design.
- 5 Granular backfill installations are only suitable where the site water table can be guaranteed not to swamp the treatment system i.e. rise above the crown of the septic tank creating a floatation issue for the Ecoflo® filter at any time during any part of the year. Please refer to the relevant (millenium tank or Ecoflo®) installation instructions in Appendix D for granular backfill for details.
- 6 If there is any doubt as to the depth of the site water table or there is a history of the water table rising to near the surface in wet conditions or there is insufficient site investigation then assume a water table will be present and the plant should be installed with concrete backfill. Please refer to the relevant (millenium tank or Ecoflo®) installation instructions In Appendix E for concrete backfill for details.
- 7 The inlet and outlet connections **MUST** be blanked during installation.
- 8 The typical treatment system supplied by Premier Tech Aqua Solutions limited is a two-tank system that comprises of a Millenium Septic (Primary) tank followed by an Ecoflo® Coco Filter tank, details of which are set out in the plant description. These tanks can be arranged in a number of configurations (gravity and water lifting) to cater for site conditions and topography.
- 9 Different treatment system configurations and indicative layouts are as set out in Appendix A: Treatment System Configurations

## 9. Start-up and Commissioning

The unit **MUST** be commissioned before sewage enter the system.

Ensure there is no dirt or materials in the septic tank.

☐

Ensure the septic tank is filled with clean water and there is a discharge from the outlet.

☐

This is best done by using a hosepipe in the inlet manhole or by running several taps in the connected household(s).

Ensure the effluent filter is correctly positioned and installed in the septic tank.

☐

Ensure the tipping bucket and the distribution plates are correctly positioned in the filter tank.

☐

Ensure that the tipping bucket is functional.

Checked by.....

Signature.....

Date.....

The Treatment Plant is now operational. However, the biological process relies on the growth of microorganisms in the filtering media. The time taken for these naturally occurring organisms to develop is dependent on temperature and is typically less than 4 weeks.

**PLEASE KEEP THIS DOCUMENT SAFE AS PART OF YOUR TREATMENT PLANT RECORDS. FAILURE TO PRESENT A COPY OF THIS DOCUMENT IN THE EVENT OF A WARRANTY CLAIM WILL VOID YOUR WARRANTY**

## 10. Maintenance Schedule

Annual maintenance is important to the proper functioning of your treatment plant.

Therefore, your plant must be serviced annually. Proper system maintenance helps maximise the life and performance of the treatment plant. It also gives the owner peace of mind knowing that the system is operating properly.

During this annual maintenance visit, all system components are inspected thoroughly to make sure they are functioning properly and the surface of the filtering media is raked to promote maximum oxygenation and eliminate build-up. The septic tank may be desludged when the sludge level reaches 50% of the water level. Sludge level measurement should be part of the annual inspection.

The expected life of the coco media is 10 to 15 years; however, it is depending on usage and compliance to the guidelines in this Operation and Maintenance Manual. Excessive or improper use, for example, putting toxic substances in the sewage treatment system,

directing surface water (from roofs, etc.) to the plant, insufficient septic tank desludging will reduce the efficiency the plant. This can then result in the filtering media having to be replaced earlier than it should. After 10 years of operation, the filtering media needs to be analysed by an approved service provider.

Depending on the state of the media it may not have to be replaced and can be used for additional year(s). However, the filter media must be replaced before the system's purification capacity begins to deteriorate. The filter media is easily removed and new filtering media installed by an approved service provider.

Replacement of Media:

Ecoflo 4 – 9 bales

Ecoflo 6 – 13 bales



Available from Premier Tech Water & Environment UK.

#### 10.1. Annual Service

*Premier Tech Aqua recommends that a **suitably approved and qualified service company** carry out the annual service.*

- If the system discharges into a watercourse such as a stream or ditch then check the vicinity for any visible signs of pollution.
- If the system discharges into a drainage field then clarify as far as possible that the effluent from the plant is soaking into the ground.
- Remove the distribution plates and score the top surface of the coco filtering media with a rake to a depth of 75 to 100mm.
- Ensure the surface of the coco bed is levelled and reposition the distribution plate.
- Visual inspection of all components and a verification of the operation and maintenance of the filtering media.
- Ensure that all the lids and covers are correctly secured before leaving site.



## 10.2. Primary Tank De-sludging

The procedure is as follows:

- A) Remove the access cover above the septic tank.
- B) The hose removing the sludge should be gently lowered into the plant.
- C) The liquid should then be removed from the tank.

It is recommended that the septic tank be filled as soon as possible with water or sewage from the serving properties.

## 10.3. Warranty

Your Ecoflo® treatment plant is supplied with a 2-year tank, filtering media and associated equipment Parts and Workmanship guarantee.

Your Millennium Septic treatment plant is supplied with a 2-year tank, filtering and associated equipment Parts and Workmanship guarantee.

This warranty is dependent upon the plant being installed, operated and maintained in accordance with this Installation, Operation and Maintenance manual.

Failure to comply with the above Terms and Conditions will invalidate the warranty.

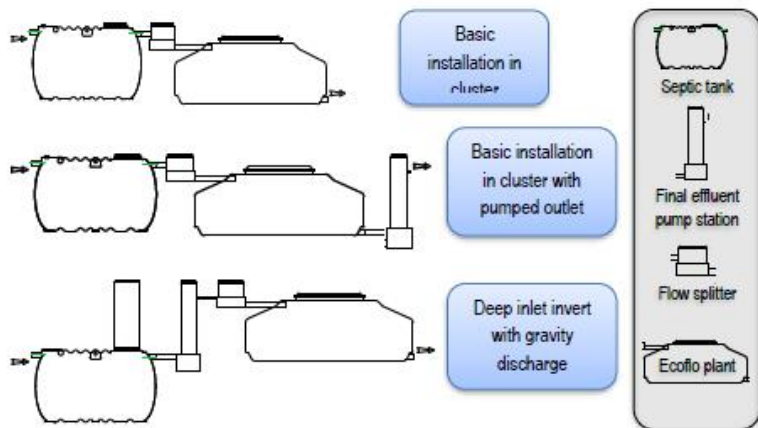
Proof of correct installation and plant maintenance (servicing) will be required in the event of any warranty claim.

Premier Tech Aqua accepts no liability for any damage or loss, including consequential loss, caused by the failure of any equipment supplied.



## Appendix A: Waste Water Treatment Plant Configuration

Product Reference	Hydraulic Loading	Organic Loading	
	litres/day	BOD <sub>5</sub> g/day	NH <sub>3</sub> g/day
4 PE	600	240	32
6 PE	900	360	48



Capacity	Hydraulic Loading	Tanks supplied		
	litres/day	Primary tank	Splitter	Ecoflo
4 PE	600	Mill 3m <sup>3</sup>	n/a	Ecoflo 4
6 PE	900	Mill 3m <sup>3</sup>	n/a	Ecoflo 6
8 PE	1200	Mill 4m <sup>3</sup>	2 ways	2 x Ecoflo 4
10 PE	1500	Mill 4m <sup>3</sup>	2 ways	2 x Ecoflo 5
12 PE	1800	Mill 4m <sup>3</sup>	2 ways	2 x Ecoflo 6
18 PE	2700	Mill 5m <sup>3</sup>	3 ways	3 x Ecoflo 6

### Introduction

When we take a bath, put the washing machine on or flush the toilet few of us stop to consider what happens to the wastewater (sewage). It simply goes down the drain or waste pipe and is no longer our concern. But if your drains lead to a packaged treatment plant, particularly one using a biological treatment system, then it's worth paying some attention to what happens next.

**If you don't** you could easily end up with a treatment plant which is not working efficiently and eventually run the risk of polluting your local environment and/or even face possible prosecution.

Sewage is made up of not just the organic waste from toilets but also the chemicals and waste water from everyday activities such as washing, cleaning, cooking and washing clothes and dishes. The sewage from bathrooms, kitchens and toilets collects in a series of drains that feed to a sewer. In most households or commercial premises the sewage flows away through a series of sewers and is treated at a large-scale sewage treatment works. However, for houses and premises in remote or isolated locations where no mains drainage is available, other options such as cesspools, septic tanks and treatment plants (i.e. Premier Tech Water & Environment) are used.

### Do:

Tell your guests/visitors/staff that you have a specialist sewage treatment plant and tell them how they can avoid harming it

### Weekly Inspections:

- Check the final effluent discharging from the unit at the sample point. If it is cloudy or contains suspended particles contact your maintenance provider.
- Think before you put anything down the sink, toilet or drains
- Read the label and use the manufacturers' recommended doses for all household cleaning products
- Use cleaning products little and often so the plant isn't overloaded
- Spread your clothes washing throughout the week
- Stick to the same washing, dishwasher powders and other cleaning products – the bacteria in the plant will work more efficiently with products they are used to
- Use liquid cleaners for clothes washing and for dishwashers, use sparingly.

### Don't:

- Spring clean and use large amounts of cleaners and chemicals in one day
- Have a "washing day" – spread your washing throughout the week
- Use household bleach and other strong chemicals indiscriminately
- Keep changing your brands of household cleaners and washing powders
- Tip bottles of medicine, mouth wash etc. down the toilet Put sanitary towels, tampons, disposable nappies, baby wipes, cotton wool, incontinence pads etc. down the toilet
- Over flush the toilet unnecessarily – use a water-saving flush if it's fitted
- Pour fat or grease down the sink or drains

- Change the oil in your chip pan and pour it down the sink
- Use your waste disposal unit like a rubbish bin – use it sparingly
- Pour garden chemicals or car engine oil down the drains

## Laundry Detergents

Firstly, you need to find out the level of hardness of your local water (see section on water softeners). Once you know how hard or soft your water is you can read the label on your laundry detergent and decide how much to use. The aim is to minimise the amount of detergent you use to limit its impact on the treatment plant whilst ensuring you get the best results from your wash.

It is recommended that you use washing liquids in an in-machine ball dispenser, rather than powders. You get the best results from having the liquid in the heart of the wash; a liquid is already in suspension and therefore “gets to work” quicker and it reduces the amount of product left in the washing machine dispenser or lost on its journey to the drum.

For normal “coloured” washes try to use a washing product without added bleach. For white washes add a separate bleach (such as the one produced by Ecover).

Read the label and stick to the dosage recommended for the level of hardness of your water and to match the level of dirtiness of your washing. This is particularly important if you are using “concentrated” or “compact” liquids or powders because it is easy for your hand to slip and for you to use far too much.

Try to ensure you have a full load each time or use an energy-saving “half load” programme if you have one. Don’t be tempted to overload as this will not produce a good wash and could damage your machine in the longer term. A correctly loaded machine should have enough space for you to put your hand in to place the liquid ball on top of the washing.

Normal wash temperatures, with the occasional very hot or “boil” wash, are not a problem for the treatment plant. However, it is not a good idea to do regular very hot washes as this could raise the plant temperature and affect the bacterial process.

Your washing machine produces the largest quantity of waste water your treatment plant has to deal with. Don’t have a “wash day” as this could produce too much water for the plant to handle in one go. Try to spread your washing throughout the week.

## Dishwasher Products

Your dishwasher cleaner is probably the most “aggressive” cleaning product in your household. It needs to be to make greasy plates sparkling and “squeaky” clean as the advertisers promise. It is therefore more important that you stick carefully to the manufacturers’ recommended dosage. It is recommended that you use a liquid, rather than powder or tablet cleaners as these are understood to be more efficient.

Most dishwashers use salt as a water softener – try to ensure the salt dispenser is always topped up because soft water increases the efficiency of the cleaning product and enables you to use only the minimum dosage of cleaner.

Dishwasher manufacturers recommend that you **do not rinse** your washing up under the hot tap before putting it in the dishwasher. Although this is a traditionally common practice dishwashers and their cleaning products are now so effective that this is unnecessary – you are merely wasting energy and hot water.

## **Other Cleaning Products**

It is most important that you always follow the manufacturers' recommended dosage on all household-cleaning products. Read the label – don't be tempted to use guesswork. Try to avoid using large amounts of cleaning products in one go. If you follow the recommended dosage and use only small quantities on a regular basis they should not have any adverse effect on the treatment plant. However, a day's spring-cleaning using massive amounts of household cleaners and disinfectants indiscriminately will affect the efficiency of the plant and destroy some of the bacteria. If the bacteria are harmed or killed they will eventually re colonise the plant, but in the meantime your plant would not be operating at peak effectiveness – depending on the amount of chemicals used.

## **Water Softeners**

To reduce the quantity of laundry detergents you use you need to find out how hard your water is. You can phone your local water company (see Yellow Pages). They will be able to tell you where your water comes on the hardness scale.

The hardness of water is determined by the amount of calcium and other minerals it contains. Hard water is rich in calcium, which reduces the effectiveness of soap and detergents. There is a scale of water hardness in England: 0 – 5° very soft, 5 – 10° soft, 10 – 15° medium hard, over 15° hard.

In line with EU recommendations, all fabric-washing products now carry advice on how much to use according to these levels of water hardness. Once you have identified where your water fits on the scale you can work out exactly how much detergent to use. If in doubt you could phone the manufacturer for advice – most offer a customer-care phone service.

## **Commercial Water Softeners**

Water softeners that involve a “salt” regeneration process can be very harmful to biological treatment systems. As the softener

regenerates a very concentrated salt solution is used. This will be toxic to the micro-organisms in your biological sewage treatment plant. Domestic water softeners for single household should not present a problem. Please contact Premier Tech Aqua Solutions if in doubt.

### **Waste disposal units**

These do not inhibit the micro-organisms, but, depending on use, they can present the treatment plant with considerable extra load. It is much better to compost your vegetables peelings etc.-its cheaper and more environmentally friendly

### **Harmful substances**

The following list consists of commonly known process inhibitors; it is not an exhaustive list. Under no circumstances should these enter the treatment plant: Just think before you dispose of any chemicals into the system – if in doubt always dispose of it elsewhere.

Jeyes Fluid; medicines; cooking oil or melted fat e.g. from a grill tray or chip pan; motor oils or other car products; garden chemicals such as weed killers or fertilisers; DIY products such as paints, white spirit, paint thinners and other solvents, glue, antifreeze, dairy waste.

## Appendix D: Granular Backfill Installation Guides

### General Notes

Note: Granular Backfill is only suitable where the water table will be below the level of the HDPE tank bases under all conditions and always of the year. Where this is not the case it may lead to tank floatation and complete installation failure.

To prevent the HDPE Primary/Septic tank becoming buoyant during desludging ensure that such operations do not take place during periods of heavy rainfall or when the site is waterlogged.

These guidance notes do not provide site specific installation instructions. If there is any doubt about any aspect of the installation, please contact Premier Tech Water & Environment.

### Excavations

- Excavations should be planned with due regard to Health and Safety and should be either battered back to a “safe” angle.
- The excavation should allow for the minimum of 300mm clearance between the tank sides and ends while considering any shoring used.
- Where tanks are required in series or parallel a minimum of 450mm is required between adjacent tanks.
- Soils with low bearing capacity (equivalent to less than 12 SPT blow counts) will require all tank clearances to be increased to half the tank diameter.
- Ground instability at formation level, may necessitate over-excavation and stabilisation with hardcore or blinding concrete.
- Geotextile material should be used where required to prevent migration of the tank back material.

### Loading

If the tank is installed in an area where traffic, or other superimposed loadings can be applied, a structural engineer should be consulted, to design a reinforced concrete slab spanning over the tank. This is to prevent the load being transmitted to the tank. If this slab is constructed immediately above the tank, it should be separated from the concrete surrounding the tank by compressible material.

### Primary Backfill Specification

Primary Backfill material should be free-flowing granular material consisting of processed stone or gravel and can be:-

Pea Gravel:

- Naturally rounded aggregate with particle size not less than 3 mm and not greater than 12 mm, compacted to a relative density of >70%.
- Pea gravel shall be clean and free flowing, free from large rocks, dirt, sand, roots, organic materials or debris. Upon

- screening analysis the backfill material shall have no more than 5% by weight passing a 2.38 mm sieve.

#### Crushed Stone or Processed Stone:

- Crushed stone /gravel or processed stone with particle size not less than 3 mm and not greater than 12 mm, compacted to a relative density of >40%. Dry density must be at least 1,500kg/m<sup>3</sup>.
- The material shall be clean and free flowing, free from large rocks, dirt, sand, roots, organic materials or debris. The material should be washed or screened to remove fine particles.
- Upon screening analysis, the backfill material shall have no more than 5% by weight passing a 2.38 mm sieve.
- All backfill material shall be free of ice and snow at time of installation. Backfill material shall not, during placement, be frozen or contain lumps of frozen material.
- Crushed stone or aggregate with sharp and irregular protrusions is not a suitable backfill material.
- **Use of other than specified backfill /bedding materials will void the tank warranty.**

#### Secondary Backfill Specification

- Secondary backfill shall not be used adjacent to the tank.
- Secondary backfill may be used only at a distance greater than 300mm from the tank walls.

The following are approved as secondary backfill materials:

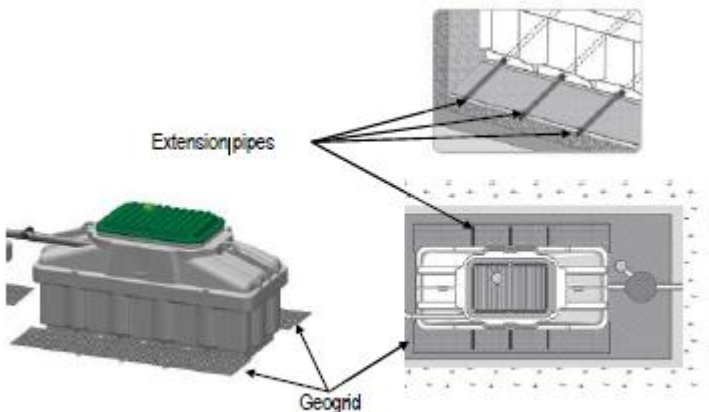
a) Coarse Sand or Gravel: Coarse sand or gravel containing rocks no larger than 36 mm on the largest dimension. The material shall be clean and free flowing, free from dirt, clay, fine sand, roots, organic materials or debris. Upon screening analysis, this backfill material shall have no more than 5% by weight passing 0.075mm sieve. During placement, this backfill material must be compacted to 95% relative compaction

b) Select Native Backfill: Clean native backfill, or clean selected backfill, containing rocks no larger than 36mm on the largest dimension. The material must be compacted to 95% relative compaction. The quality of this backfill material shall be such that it exhibits an ultimate bearing strength in excess of 170kPa in the compacted state.

## Ecoflo® Filter Tank

### Primary Backfill Installation

- Tanks must be installed with Primary Backfill only within the region immediately surrounding the tanks. Ensure material is clean and contains no oversize material.
- Place primary backfill bedding material; the tank bedding depth directly below the tank, must be a minimum of 250mm below the tank to natural ground/concrete base if used. **The tank must not rest directly on natural ground or a concrete base.**
- The Primary Backfill must extend a minimum of 300mm outward from the tank sides and ends.
- Compaction should be by lightweight rollers or vibratory plate compactor.
- The use of geotextile barrier fabrics surrounding the Primary Backfill material is considered good installation practice.
- Insert 3 extension pipes in the openings at bottom of Ecoflo® filter tank Lift tank into position using the lifting points and align as required for connecting pipework.
- Install the geogrid on top of extension pipes (each side of tank)
- Commence backfilling on geogrid and around the tank, with primary backfill material, in layers of approximately 250 mm, continue backfilling, with primary backfill material, evenly around the tank to at least 250mm above the tank top.





## Rewatec Super Reinforced Septic Tank

- Tanks must be installed with Primary Backfill only within the region immediately surrounding the tanks.
- Ensure material is clean and contains no oversize material.
- Place primary backfill bedding material; the tank bedding depth directly below the tank, must be a minimum of 300mm below the tank to natural ground/concrete base if used.
- **The tank must not rest directly on natural ground or a concrete base.**
- The Primary Backfill must extend a minimum of 300mm outward from the tank sides and ends.
- Compaction should be by lightweight rollers or vibratory plate compactor.
- The use of geotextile barrier fabrics surrounding the Primary Backfill material is considered good installation practice.

## **Appendix E: Concrete Backfill Installation Guides**

### **General Notes**

These guidance notes do not provide site specific installation instructions. In aggressive soils or for structural applications specialist advice should be obtained. If there is any doubt about any aspect of the installation please contact Premier Tech Water & Environment.

### **Excavations**

Excavations should be planned with due regard to Health and Safety requirements, and should be either shored or battered back to a “safe” angle.

The excavation should allow for the minimum clearance between the tank sides and ends identified in these instructions while taking into account any shoring used. Where tanks are required in series or parallel a minimum of 200mm is required between adjacent tanks.

Ground instability at formation level e.g. running sand, may necessitate over-excavation and stabilisation with hardcore or blinding concrete.

### **Buoyancy and Anchoring**

The mass of the concrete backfill may need to be increased if there is a risk of high ground water level at the tank location.

To avoid floatation it is recommended that a factor of safety of 1.5 against floatation is used. Mass concrete has a minimum density of 2,300 kg/m<sup>3</sup>, the client should retain a suitably experienced professional or installer to confirm the mass of concrete required.

### **Loading**

If the tank is installed in an area where traffic, or other superimposed loadings can be applied, a structural engineer should be consulted, to design a reinforced concrete slab spanning over the tank. This is to prevent the load being transmitted to the tank or the concrete surround. If this slab is constructed immediately above the tank, it should be separated from the concrete surrounding the tank by compressible material.

### **Concrete Specification**

1. The specification for the concrete mix to surround the tank should be selected by the tank installer taking into account the site conditions and application requirements.
2. For a typical non structural application in good ground conditions, with non aggressive soils, a concrete with a 28 day compressive strength of 20 to 30N/mm<sup>2</sup> with a 25 to 50mm slump, complying with the relevant BS EN, is generally suitable. For non typical applications, aggressive soils or structural applications specialist advice should be obtained.

### **Concrete Lift height (rate of rise)**

The lift height (m), or rate of rise (m/h) for the specific concrete type used must be determined by the installer such that a design pressure (P max) of not more than 15kN/m<sup>2</sup> exerted by the wet concrete onto the tank is not exceeded.

### **Vibration**

The design of the HDPE tank assumes minimal compaction of the surrounding concrete. Where necessary, this may be extended to include light internal vibration. Do not use deep revibration which will substantially increase the pressure on the tank, possibly causing failure.

### **Impact of Concrete on Discharge**

The effects of concrete discharge impact are considerable. These effects must be considered to ensure the maximum pressure of 15kN/m<sup>2</sup> on the tank is not exceeded. Under no circumstances should concrete be discharged directly onto the tank.

### **Control of Groundwater**

Tanks must not be subjected to buoyant forces during installation, taking account of ground water levels and surface water run-off, and their accumulation in the tank excavation. Ensure that excavations are kept clear of surface or ground water providing excavation dewatering as necessary.

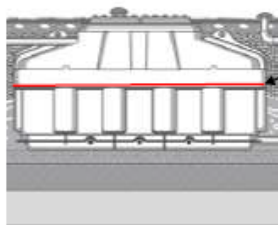
### **Rewatec Reinforced Septic Tank & Ecoflo® Filter Tank**

#### **Installation Procedure**

- Maintain a completely dry excavation until the final pour of concrete has set. Failure to do this may result in voids beneath the tanks.
- Insert 3 extension pipes in the openings at bottom of Ecoflo® filter tank.
- Place the concrete in the base of the excavation to form a level and smooth base, with a thickness of 250mm, onto which the tanks can be placed. Note that

this installation procedure assumes that the base of the septic tank and the Ecoflo® filter are at the same formation level.

- Where the tank bases are not at the same formation level it is up to the installer to schedule and make adequate provision for the casting of the offset bases.
- Place the Rewatec septic tank and the Ecoflo tank onto the concrete base while the concrete is still wet. Connect the pipework to the tank, ensuring correct alignment.
- Fill the Rewatec Septic tank with clean water to a depth of 300mm and recheck the pipework levels and connections.
- Commence backfilling evenly around the tanks in lifts of 300mm with concrete ensuring there are no voids, particularly at the bottom of each tank shell. Continue filling the Rewatec Septic tank with water whilst evenly backfilling with concrete around the tanks ensuring that the progressive water level in the Rewatec septic tank is no more than 300mm above the concrete level.
- Backfill the Ecoflo® filter tank to the maximum level indicated on the following diagram; concrete must not exceed this level.



Maximum level of concrete backfill around

Concrete must not exceed this level as there is a risk of deformation and would void

- Provide temporary works to ensure that the remaining concrete to be poured around the Rewatec septic tank will not impinge on the Ecoflo® filter.
- Continue backfilling around the Rewatec Septic tank whilst ensuring that the progressive water level in the Rewatec septic tank is no more than 300mm above the concrete level.
- Connect and seal turret extensions to the Rewatec Septic tank prior to completing the concrete encasement of the tank. The access shaft turret extension should be trimmed from the bottom to the required height before connection to the tank.
- The junction of the access shaft extension and the main tank should be adequately sealed against the ingress of water.
- Sealing can be accomplished by the use of suitable silicone caulking and/or butyl tanking materials. The extent of sealing required is subject to site conditions and the expected hydrostatic head that may develop in the completed installation. Where it is suspected that a high water table may persist for an extended duration externally applied butyl backed tanking material applied to the GRP extension and lapped over the HDPE collar in combination with a butyl tape seal internally is recommended and this should be applied prior to pouring the access shaft concrete surround.
- Access extensions should be surrounded with concrete poured in 500mm lifts, allowing an initial set between each lift.
- The pressure from concrete placed in higher lifts may cause access extensions to distort or collapse.

- Using appropriate formwork continue pouring concrete around the tank superstructure, i.e. access turrets, in lift heights not exceeding 500mm, allowing the concrete to set between each lift.
- The lift height, rate of concrete rise, or concrete compaction must not be to an extent which causes any part of the tank superstructure to distort, as this will damage the tank.
- Once the concrete is initially set up around the Rewatec Septic tank remove any temporary formwork and complete the backfill to ground level over the Rewatec septic tank and the Ecoflo® filter tank with granular backfill.
- Complete the backfill to ground level using free flowing granular material with backfill material as specification in Appendix D.
- Ensure the cover and frame(s) on both the Ecoflo® filter tank and the Millennium Septic tank are correctly secured.

### **Threaded Inspection Points/Ventilation**

- The red/green threaded inspection/rodding points above the inlet connection are not required for the UK/Irish market.
- Rodding access should be provided at the upstream manhole and these threaded covers should be securely tightened and backfilled with the tank.
- Septic Tank ventilation would generally be via the stack pipes on the property/properties served or a remote vent taken from the inlet drainage line.

