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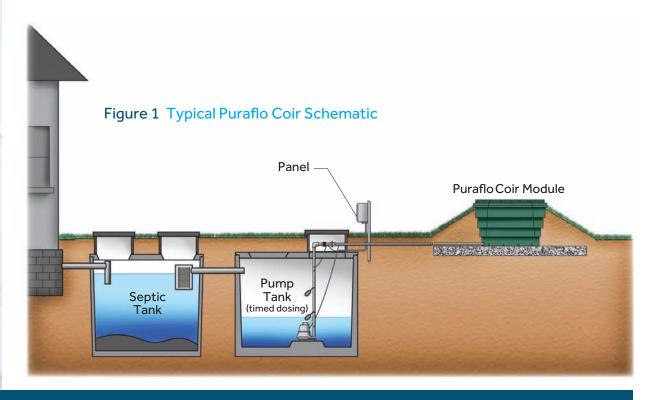
1.0 General Description of System

The Puraflo Coir is an advanced secondary treatment system that purifies septic tank effluent to an extremely high degree before final dispersal.

A typical Puraflo Coir system consists of:

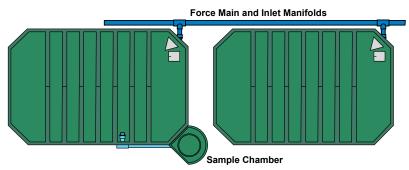
- Septic tank with a commercially-rated effluent filter connected to the tank outlet pipe
- Dosing tank and effluent pump to accommodate dosing of the septic tank effluent onto the coconut fiber media
- Biofilter modules where advanced treatment occurs due to the physical, chemical and biological processes that are optimized in the coconut fiber media.
- Site specific, final effluent dispersal system

The filtered septic tank effluent is collected under gravity in the pump tank. A timed dosing system is activated by a programmable timer which pumps the effluent through a flow splitting inlet manifold located at the base of the treatment modules. An orifice plate is located inside the top of each inlet manifold which allows the flows to be split equally and fed simultaneously to each rectangular distribution grid with helical spray nozzles located underneath the module lid. The effluent percolates laterally and vertically through the depth of the coconut fiber and emerges as a clear, innocuous liquid from the base of the system. The treated effluent is then collected and dispersed.



1.1 Type A and Type B Installation

Type A - Pad Installation

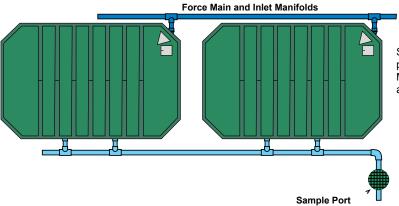


Blue coded modules with weep holes and one green coded module with sampling chamber, drain into a stone pad for final treated effluent disposal. Pad dimensions can be selected to match site conditions and modules can be installed side-by-side as well as end-to-end (as shown above)

NOTE:

In-ground pad (trench) configuration.

Type B - Piped Outlet Installation



Sealed white coded modules (no weep-hole placed on a 6" support gravel bed. Modules connected via outlet manifolds to a gravity Drain Line.

NOTE:

Final dispersal separate from modules configuration.

1.2 Specification of Puraflo Coir Module

Max Treatment Capacity per Module: 200 gpd

Module Length: 7' 1"
Module Height: 2' 6"
Module Width: 4' 6"
Module Weight: ~900 lbs





2.0 Basic Operation and Maintenance Requirements

At each Puraflo inspection, the Authorized Service Provider shall (at a minimum) perform the activities listed below:

2.1 Observe and Monitor

- Effluent level in all tanks
- Septic tank outlet filter or screened pump vault for clogging
- Watertightness of tanks, risers and pipe connections at tanks
- Operation of pumps, floats valves, electrical controls and alarms
- Pumping frequency from impulse counters and elapsed run time meters
- Modules for any structural damage, accessibility, adequate ventilation, excess odors, insect or other pest infestations
- Vegetative growth over the drainfield
- Drainfield area for surfacing of the effluent
- Sample of coconut biofilter effluent collected form the sampling point to check for effluent clarity and odor (note: coconut biofilter effluent may have a brackish to straw color from the humic and fulvic acids naturally present in the coconut fiber media)

2.2 Measure and Report

- Sludge and scum levels in the septic tank
- Sludge level and grease presence in the pump tank
- Pump delivery rate (drawdown test)
- Dosing volume and measure or calculate average pump run time

2.3 Notification of Service/Repair Requirements

The Authorized Service Provider shall alert the system owner in a timely fashion of needed maintenance or repair activities including, but not limited to, landscaping, tank sealing, tank pumping, pipe or control system repairs, media replacement, and adjustments to any other component.

3.0 Annual Maintenance Checklist

System Component	Description
Septic Tank	Confirm access ports are secure.
	Confirm effluent filter is in place.
	Clean effluent filter.
	Confirm satisfactory condition of risers.
	Confirm satisfactory condition of pipe.
	Record wastewater level in tank.
	Record sludge level in tank.
	Record scum level in tank.
	Confirm watertightness of tank connections.
	De-sludge Septic Tank (if required).
Pump Tank	Confirm access ports are secure.
	Record wastewater level in tank.
	Confirm watertightness of tank.
	Confirm satisfactory condition of risers.
	Confirm satisfactory condition of pipe connections.
Pump	Confirm pump is accessible and removable.
	Confirm pump is operating satisfactorily.
	Confirm floats are operating satisfactorily.
	Confirm pump valves are operating satisfactorily.
	Record the condition of floats, control panel and alarms
	Record pump readings.
	Record Elapsed Time meter Readings.
	Examine and Record Timer Settings.
Control Panel	Record the condition of control panel and alarm.
	Record pump readings.
	Record Elapsed Time meter Readings.
	Examine and Record Timer Settings.
	Confirm alarm is working.
Sample Chambers	Confirm satisfactory condition of sample chamber.
•	Extract effluent sample.
	Conduct odor and visual inspection of sample.
Piping	Confirm satisfactory condition of force main.
, 3	Confirm satisfactory condition of manifold.
	Confirm satisfactory condition of manifold. Confirm satisfactory condition of orifice plates/connections.
Coconut Fiber Media	Record the condition of the coconut fiber.
	Examine coconut fiber for insect or pest infiltration.
	Check for evidence of continuous ponding on media surface.
	Confirm distribution grid is level.
	Confirm even distribution of wastewater within modules.
	Confirm that the ventilation holes around top of module are free from obstruction.
Drainfield	Check for evidence of surface water diversion.
D. Willion	
	Check for evidence of ponding/surfacing of effluent.
	Check for excessive vegetative growth over drainfield.
	Confirm stability of percolation area.

4.0 Periodic Removal of Solids

A well maintained septic tank is essential for most on-site treatment systems as the septic tank provides the first step in wastewater treatment (also called primary treatment). During use, the heavier solids settle to the bottom forming a sludge layer while the lighter solids, greases and oils float to the top to form a scum layer. The anaerobic conditions created in the septic tank by the scum layer allow anaerobic and facultative microorganisms to break down (feed on) and reduce the sludge and scum volume. In this manner approximately 40 percent of sludge and scum volume can be reduced. However, the remaining solids accumulate in the tank and must be pumped out on a regular basis.

The septic tank (and occasionally the pump tank) should be inspected annually and pumped in accordance with State and Local guidelines. Depending on use, a typical home will produce sufficient sludge requiring the septic tank to be pumped every 2 to 10 years. The importance of desludging can not be over-emphasized since the Puraflo system is designed to treat effluent from a well functioning septic tank where a significant portion of insoluble solids have been allowed to settle out. The effluent filter installed with the Puraflo system should be cleaned annually or at the time of system inspection. The inspection/desludging should be carried out by a qualified septic pumper and should not be attempted by the homeowner.

Note: A filter is installed on the septic tank outlet pipe to prevent the carryover of solids to the treatment system. If septic tank maintenance recommendations and practices are not followed and in particular, if large objects are disposed into the septic tank, the filter will clog causing wastewater to backup into the house.

5.0 Puraflo Coir Effluent - Sampling and Analysis

5.1 General Requirements for Sampling

- Where required by State and Local regulation the following describes the correct methods for collecting and transporting an effluent sample to an accredited laboratory.
- The person responsible for sampling (here after referred to as the sampler) should have a technical background and be familiar with the workings of the Puraflo system.
- Personal safety should be the first consideration of the sampler. The sampler should wear protective clothing, eye protection and sterile disposable gloves at all times. The gloves should be discarded immediately after sampling (i.e. one pair of gloves per sampling event). This safeguards against cross contamination of samples. Always wash hands after sampling.
- All samples shall be obtained, preserved and analyzed in accordance with the guidelines outlined in EPA's document 40 CFR 136.
- All samples for inorganic analysis (i.e. BOD, TSS) should be collected into sterile plastic containers (or equivalent). All samples for microbiological analysis should be collected into sterile plastic containers (or equivalent). Different laboratories provide different sampling containers.
- The volume of sample required for proper analysis varies according to the test performed. Confer with the local laboratory to establish the volume requirements needed based on the total number of parameters requiring analysis.

- All sampling containers should be clearly labeled to include, as a minimum, the following information:
 - A unique sample identification number
 - The source/location of sample collection
 - Date and time the sample was collected
 - The name of the sampler responsible
 - The name of the treatment system owner
 - All parameters requiring analysis
- All samples must be properly stored during transportation to the laboratory. This usually involves transporting the sample in cold storage and keeping it in the dark (away from sunlight) to inhibit further biochemical reactions.
- All time sensitive samples (e.g., fecal coliform) must be delivered to the laboratory within 6 hours of sampling. Therefore, travel time, laboratory operating hours, weekend or holiday schedules all need to be considered with any sampling program.
- The laboratory responsible for analysis must be certified or accredited and have a chain of custody and quality control/quality assurance system in place.
- Complete all chain-of-custody forms.
 Retain a copy for your records and forward a copy to info@anuainternational.com.

5.2 Puraflo Coir Sampling Protocol

- Put on protective clothing, eye protection and gloves where required.
- Locate and remove the lid of the sampling chamber, exposing the effluent discharge pipe below. Typically, there should be a slow steady drip of effluent from the discharge pipe. Do not force flow through the system by running the pump in manual operation.
- Clean the discharge pipe to remove any residual solids or a 'slimy growth'.
- Once the effluent is free flowing, carefully place the mouth of the sample bottle directly under the falling stream of effluent. Be careful not to touch the discharge pipe with the mouth of the sample bottle. If the sampling bottle is too tall to fit under the discharge pipe, a 'dipping device' may be required. Please ensure that the dipping device is thoroughly cleaned and sterilized before sampling
- Refill the container almost to the top, leaving approx. 1-5% of the container volume to allow for thermal expansion during transportation. It may take 10 to 20 minutes to acquire the needed volume prescribed by the accredited lab.
- If a microbiological sample is required, a sterile plastic container (or equivalent) should be used. Carefully remove the lid of the sampling container using the thumb and forefingers. Fill the bottle to the top, and replace the lid immediately. Do not rinse the bacteriological sampling container, fill it only once, being careful not to allow your hands to come into contact with the rim of the container. Extreme care must be taken because even a properly collected sample can become contaminated.

- Label all sampling containers with the following information:
 - A unique sample identification number
 - The source/location of sample collection
 - Date and time the sample was collected
 - The name of the sampler responsible
 - The name of the treatment system owner
 - All parameters requiring analysis
- Note any unusual occurrences during sampling.
- Remove the protective gloves and dispose of carefully.
- Store all samples in an ice chest with ice packs (or equivalent) for transportation to the lab.
- Store all samples in the dark.
- All time sensitive samples (e.g., fecal coliform) should be delivered to the laboratory within 6 hours of sampling.
 All samples should be analyzed on the same day as sampling.

5.3 Visual and Odor Inspection

The Puraflo Coir system should produce an effluent that is virtually clear of suspended solids, however, the effluent may sometimes have a slight brown-yellow color due to varying concentrations of naturally occurring organic compounds (humic and fulvic acids; tanins) which are occasionally leached out of the coconut fiber.

The system should produce an effluent with virtually no odor, although a slight earthy smell may be detectable on occasions. If the system is producing an effluent which gives off an offensive odor or that which contains a high concentration of suspended solids, then the system may be experiencing difficulties and troubleshooting should be carried out.

6.0 Replacing System Components

6.1 Replacing the Pump

Equipment Required: Screwdriver, wire ties, pliers, gloves and replacement pump

- Isolate main power
- Unwire pump
- Remove pump tank access port
- Disconnect force main piping
- Extract pump (pull-rope/pull-chain)
- Remove wire from conduit
- Remove force main piping from pump
- Discard of spent pump in accordance with proper regulatory handling and disposal rules
- Connect force main piping to replacement pump

- Install wiring in conduit
- Lower pump back into original position
- Reconnect force main piping
- Reconnect power the system
- Go to control panel
- Switch from automatic to manual to activate the pump
- Carry out drawdown test
- Make timer adjustments as required.
- Return control panel to automatic setting
- Close control panel and secure
- Secure access port back in place

6.2 Replacing the Float(s)

Equipment Required: Screwdriver, wire ties, pliers, gloves and replacement float

- Isolate main power
- Unwire float connection to control panel
- Remove pump tank access port
- Remove defective float and replace
- Secure access port back in place
- Reconnect float connection to control panel
- Reconnect main power

6.3 Replacing the Control Panel/Alarm

Equipment Required: Screwdriver, wire ties, pliers, gloves and replacement panel

- Isolate Main Power
- Unwire inlet power from control panel
- Unwire pump connections from control panel
- Unwire float(s) from control panel
- Disconnect inlet conduit
- Unscrew control panel from mounting bracket
- Discard of spent control panel pump in accordance with proper regulatory handling and disposal rules
- Mount new control panel

- Reconnect inlet conduit
- Rewire float(s) connections
- Rewire pump connections
- Rewire inlet power
- Reconnect main power
- Switch control panel from automatic to manual to activate pump
- Remove the access port from the pump tank
- Raise alarm float in pump tank to test alarm
- Secure access port back in place

7.0 Troubleshooting Checklist

Detection	Possible Cause	Action
Experience slow-flush but electrical system is operational	Unacceptable level of solids in septic tank Effluent filter blocked	Pump out septic tank and clean effluent filter Clean effluent filter
Alarm sounds continuously and effluent level rises steadily in the pump tank – this can eventually lead to slow-flush caused by sewage backing up and could eventually cause effluent to pond at the septic or pump tank	Pump failure due to circuit breaker switch being tripped to the "off" position by an electrical storm or power surge Pump fails due to faulty electrical system or pump is faulty	Conserve water usage, reset circuit breaker and test the alarm – if the problem recurs call your Authorized Service Provider Conserve water usage and call your Authorized Service Provider
Alarm sounds periodically but resets itself (indicating that the pump is still operating) Note: Some states require alarms that are latched (continue to alarm after the alarm event has been corrected) and will not auto-reset themselves in which case it will be necessary to reset the alarm manually	High water usage above design capacity activates the alarm float switch Leaking plumbing fixtures Leaking pump or septic tank Broken timer or incorrect timer settings Latched alarm	Reduce water usage to range within the design capacity Repair leaking plumbing fixtures Repair leaks in septic or pump tank Conserve water usage and call your Authorized Service Provider Reset manually
No alarm warning – effluent level rises continuously in the pump tank potentially leading to slow-flush and/or effluent ponding around septic or pump tank	Pump and alarm failure due to circuit breaker switches being tripped to the "off" position by an electrical storm, power surge or power failure Pump and alarm fail concurrently due to faulty system electronics	Reset circuit breaker and test the alarm – if the problem recurs call your Authorized Service Provider Conserve water usage and call your Authorized Service Provider
Ponding of effluent on coconut fiber media	Failed drainfield Media at end of useful life	Consult with your Authorized Service Provider Replace coconut fiber media and dispose of spent media per local regulations

Appendix 1 Puraflo Coir Inspection Checklist

Contact Details	
Client Name:	
Site address:	
State/Zip: Phone:	
Service Provider:	
Address:	
State/Zip:	
Phone:	
Ref no:	
Date installed:	
Inspection Date:	
Regulatory Authority:	

Septic Tank	
Is septic tank accessible?	Yes No
Are access covers secure / filter in place?	Yes No
Wastewater level in tank:	
Sludge level in tank:	
Scum level in tank:	
Date of last de-sludging:	
Does tank need de-sludging?	Yes No
Watertightness of septic tank:	Satisfactory Unsatisfactory
Condition of risers:	Satisfactory Unsatisfactory
Condition of pipe connections:	Satisfactory Unsatisfactory
General comments:	

Pump Tank	
Is pump tank accessible?	Yes No
Are access covers secure?	Yes No
Effluent level in tank:	
Sludge level in tank:	
Is there sludge carryover?	Yes No
Is grease present in pump tank?	Yes No
Watertightness of tank:	Satisfactory Unsatisfactory
Condition of risers:	Satisfactory Unsatisfactory
Condition of pipe connections:	Satisfactory Unsatisfactory
General comments:	

rump		
Is pump accessible and removable?	Yes No	
Is pump operating satisfactorily?	Yes No	
Are floats operating satisfactorily?	Yes No	
Are valves operating satisfactorily?	Yes No	
Condition of floats, control panel and alarm	s:	
Result of drawdown test:	Satisfactory Unsatisf	actory
Pump Readings		
Pump delivery rate:	Pump delivery dose:	
Last pump reading (A):	Date of last pump reading (C):	
Current pump reading (B):	Date of current reading (D):	
Difference (X) (i.e. B - A):	# days in period (Z) (i.e. $D - C$):	
Average (X/Z) gallons:		
ETM Readings		
Last ETM reading (A):	Date of last reading (C):	
Current ETM reading (B):	Date of current reading (D):	
Difference (X) (i.e. B - A):	# days in period (Z) (i.e. $D-C$):	
Average (X/7):		

Timer Settings	
On-setting: Off-setting:	
Alarm Conditions	
No. of times alarm has been activated:	
Reason for activation:	<u>_</u>
General comments:	
Water Supply	
Water source: Well Community water supply Water haul or ciste	ern
Water meter reading (A): Last water meter reading (B):	
Date of last reading: (C) Date of current reading (D):	
Difference (X) (i.e., B – A): # days in period (Z) (i.e., D – A):	
Average amount of water per day (X/Z):	
s there a water softener or water conditioning unit?	

Coconut Fiber Modules	
Are the modules accessible?	Yes No
Any structural damage evident?	Yes No
Adequate ventilation?	Yes No
Any excess odors?	Yes No
Berm condition?	Satisfactory Unsatisfactory
Condition of coconut fiber media OK?	Yes No
Any insect or other pest infiltration?	Yes No
Any ponding of media surface?	Yes No
Even wastewater distribution?	Yes No
Drainfield Drainfield type: In-ground pad	Mounded pad
Trench	Other (please specify)
Any surface water diversion?	Yes No
Any ponding/surfacing of effluent?	Yes No
Any excess vegetative growth over the dra	ainfield? Yes No
Stability of percolation area?	Satisfactory Unsatisfactory
If pressure dosing to drainfield, please pro	ovide lift station, pump and control panel detail:

Force Main	
Is main line OK?	Yes No
Is manifold OK?	Yes No
Are orifice plates OK?	Yes No
Are connections OK?	Yes No
General condition:	Satisfactory Unsatisfactory
Monitoring Systems	
Condition of sample chamber OK?	Yes No
Sample appearance OK?	Yes No
Condition of monitoring wells (if any) OK?	Yes No
Drainfield ports (level) OK?	Yes No
Samples taken (how many and where)?	
General comments:	
Inspected by:	Date:
Customer Signature:	Date:

Appendix 2 Puraflo Coir Effluent Sampling

Client Name:
Site address:
State/Zip:
Phone:
Ref no:
Date installed:
Was contact made with owner prior to visit?
Was occupancy established?
Please confirm that a passive sample was taken: Yes No (Please confirm that pump <u>was not</u> activated)
Please check if: Solids present Odor Grease Color
Sampled by: Date of sampling:
Time of sampling: Delivery to laboratory:
Name of laboratory:
Address of laboratory:
State/Zip:
Name of laboratory analyst(s):
Laboratory accreditation details:

Monitoring Systems

Sample ID	Parameter	Units	Influent	Effluent

Laboratory signature:		
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Labolatoi v Siuliatui E.		

Appendix 3 Puraflo Coir Troubleshooting Report

You may also email: info@anuainternational.com.

Client Name:	
Site address:	
State/Zip:	
Call out performed by:	
Maintenance performed by:	
Phone:	
Ref no:	
Date installed:	
Number of modules:	In-ground pad Mounded pad Trench Other
Please check reason for call-ou	
Maintenance	Call-out
Warranty	Warranty
Annual maintenance	Emergency call-out
Maintenance contract	
No maintenance contract	Maintenance contract
	☐ No maintenance contract
Other (please specify)	Other (please specify)
Date reported:	Date addressed:
Problem:	
Cause of problem:	
Corrective action taken:	
Problem corrected?	Yes No
Please send a copy of the Troubl P.O. Box 77457. Greensboro. NC	eshooting Report, with a copy of the inspection checklist to Anua at 27417.

Appendix 4 Puraflo Coir Remedial Work Report Sheet

Section A - Site Information Report Sheet No: Date: System Owner: Site address: State/Zip: Time of arrival: _____ Anua representative: _____ No. of labor hours: _____ Cost of remedial work: _____ **Section B - Site History** Please give details: Section C - Remedial Work Please give details: __ Section D - Comments/Further Work Please give details: Signed for Anua: Signed by owner (if present):

Notes:



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