

Biolytix BioPod (BF7) Wastewater Treatment System

Specifications

The Biolytix BioPod (BF7) is an onsite treatment system designed to treat wastewater from domestic sources. It uses a double tank configuration based on a pre septic tank and an enhanced trickling filter process which mimics a natural soil habitat. The BF7 is certified to comply with AS/NZS 1546.3:2008 and must be operated in accordance with this standard.

Effluent Quality

The BF7 wastewater treatment system generates secondary treated effluent of the following quality:

- 5-day Biochemical Oxygen Demand (BOD₅) <20 mg/L
- Suspended solids <30 mg/L

The effluent must be disposed of as stipulated by the local Territorial Authority. AS/NZS 1547:2012 describes discharge options for secondary-treated effluent. However, the Territorial Authority regulations applying to a specific site may be different and more stringent and should be consulted before making a decision.

Maximum Loading

- Flow rate: 2400 L per day
- Organic loading as BOD₅: 1 kg per day
- Suspended solids loading: 1 kg per day

Important: The actual maximum loading of an installed BF7 is limited by the capacity of the dispersal system it discharges to. For example, if the BF7 is connected to a land dispersal system with a capacity of 1000 L/day, then the BF7 must not be loaded at more than 1000 L/day.

Operation

- Emergency storage capacity: 2400 L
- Temperature and humidity: Operates under normal temperature and humidity conditions experienced in New Zealand and the Pacific Islands.
- Noise < 40 dBL at a distance of 1 m
- Electricity consumption (per year): Treatment process 44 kWh; effluent pump typically 165 kWh (per year). Effluent pump power use can vary significantly depending on the size and location of the dispersal system and the actual household water usage.
- Maintenance: Requires at least an annual service (Note: Some Territorial Authorities require at least two services per year regardless of the type of on-site wastewater system)
- Minimum serviceable life: 15 years



Treatment Process

The BF7 filter process (Figure 1) is contained in two Everhard injection moulded high-grade polypropylene tanks in series. The first tank receives all the household wastewater via standard gravity drainage. The first stage tank has a septic stage capacity of 3000L. Raw effluent is primary treated by anaerobic digestion and settling of solids. Primary treated effluent gravity flows through to a standard Biolytix BF6 (the second tank). The second tank is a standard Bio-Pod and consists of six layers of drainage elements and peat/drainage elements. All layers contain plastic trickling filter media contained in open-mesh bags. In the filter bed there is in excess of 2m³ of plastic filter media with a high porosity and a high specific surface area. The peat layers additionally contain coco peat, the fibrous structure of which significantly increases the available treatment surface area and the ability to retain moisture. The layers are separated by coarse HDPE mesh fabric.

The resulting filter bed mimics a natural soil habitat, containing a diverse ecosystem of micro and macro-organisms. These organisms aerobically treat the wastewater as it percolates through the bed, prevent the accumulation of sludge, and keep the filter aerated. On commissioning, the filter is inoculated with a kilogram of tiger worms (*Eisenia Fetida*). These worms propagate and burrow through the filter bed, thereby keeping its structure open and porous. A Schego M2K3 air pump is used to provide additional air to the bed at the rate of 350 L per hour.

A geotextile filter layer with a nominal pore size of 80 micron separates the filter bed from the effluent storage sump. Its purpose is to remove fine solids from the treated effluent. To support the bed, the sump is filled to a depth of 400 mm with a matrix of plastic media. It drains into the central pump well, from where the effluent is pumped using a submersible pump to a land dispersal system (e.g. subsurface drip irrigation). The pump is controlled by a factory set float switch. The total bed depth including sump is 1050 mm.

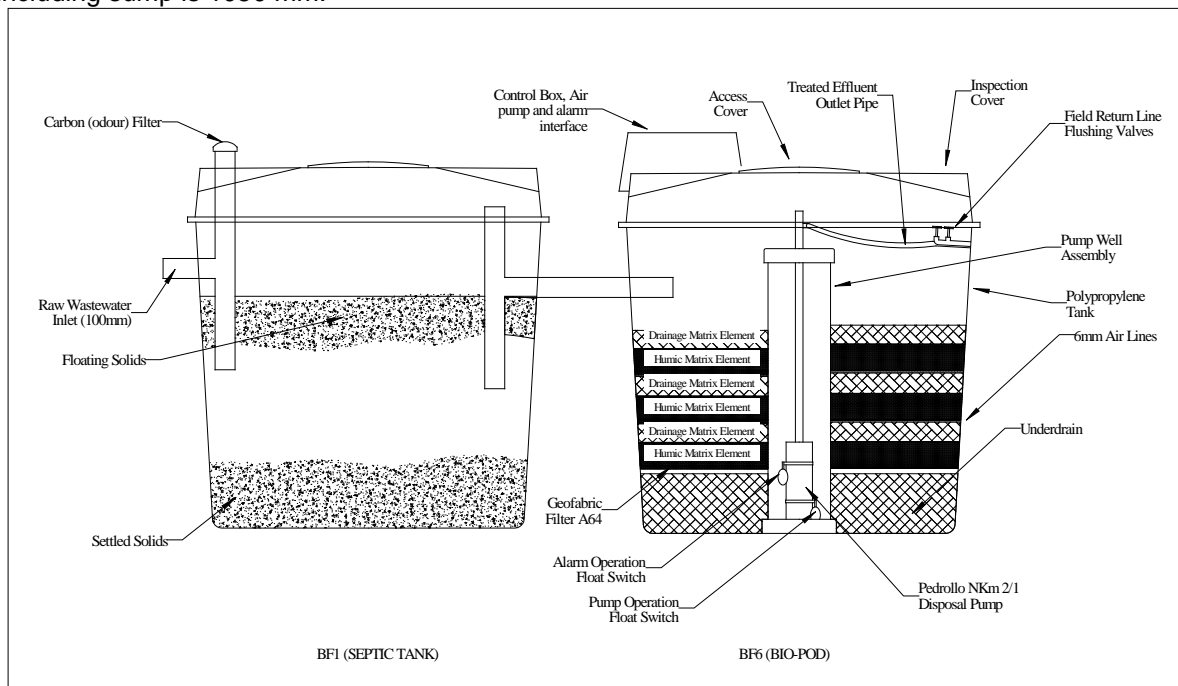


Figure 1 Biolytix BF7 wastewater treatment system

Configuration Options

Installation

The BF7 can be installed in-ground or above ground. Local Council restrictions may apply to above-ground installations (Land Use/Building Consent conditions etc). Available tank sizes are 3000 L and 4000 L. Both tanks have the same bed configuration and provide the same treatment capacity and performance, but use different inlet invert depths as follows:

- BF6-3000 tank: 650 mm
- BF6-4000 tank: 1100 mm

Effluent Discharge

The BF6 effluent is either gravity drained or pumped to a dispersal system. The pumpout (dose) volume is 220 L per cycle. The standard pump is a high-quality Pedrollo NKm 2/1 submersible pump, the characteristics of which are shown in Figure 2 below. Other Pedrollo pumps may be used instead to suit specific sites. Contact Biolytix to discuss your requirements and for information on the types of pumps available.

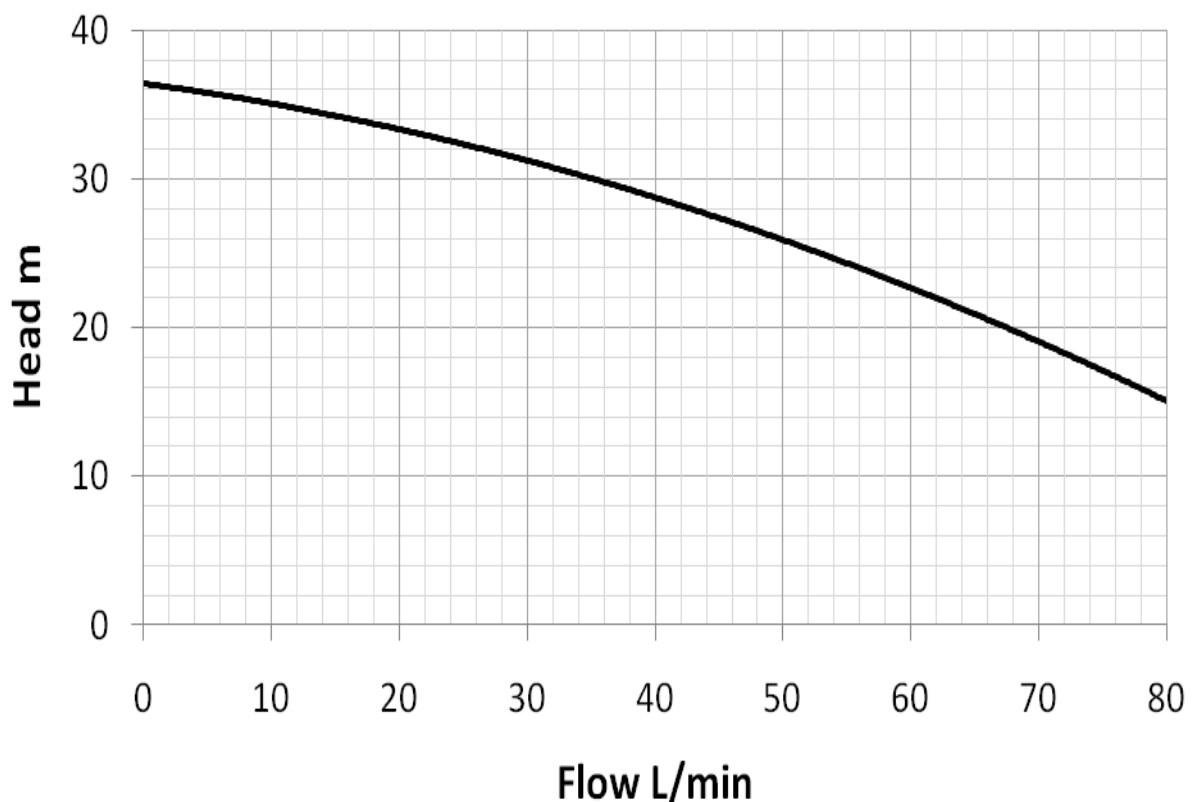


Figure 2 Pedrollo NKm 2/1 characteristic curve (power 0.45 kW)

Alarm System

The BF6 is equipped with an audible and visual alarm both mounted on the control panel which is housed on the top of the tank. An optional AS/NZS 1547:2012 compliant audible & visual alarm panel is available which has a mutable audible alarm with a 24 hour reset and an alarm light. The alarm panel is typically mounted in a visible location within the dwelling. Some Council may require the use of the optional alarm panel.

Alarms are triggered by either a high-level float switch in the pump well or an air pressure switch on the air supply line.