

Tricel® Vitae UK6

Wastewater Treatment Plants

Engineering a green future



Contents

1	Health & safety precautions.....	4
1.1	General	4
1.2	Electrical maintenance	4
1.3	Installation.....	5
2	Introduction: Tricel Vitae.....	6
2.1	The Wastewater purification process	6
2.1.1	Stage 1: Buffer chamber	6
2.1.2	Stage 2: Aeration (treatment) chamber.....	6
3	Tricel Vitae specification.....	7
3.1	Dimensions	7
3.2	Tank drawing.....	8
4	Transportation & lifting.....	9
4.1	Transportation	9
4.2	Lifting.....	9
5	Installation.....	11
5.1	Installation planning	11
5.2	Inspection on reception of tanks	12
5.3	Positioning and precautions.....	12
5.4	Types of installation.....	12
5.5	Installation procedure: Tricel Tanks	13
5.5.1	Excavation (dry & wet sites):	13
5.5.2	Step by step – installation procedure.....	15
5.6	Gravel specification.....	16
5.7	Concrete specification.....	17
5.8	Topsoil requirements	17
5.9	Electrical requirements	17
5.10	Risers.....	18
5.11	Non-standard	18
5.11.1	Alternative to concrete backfill (for wet sites without risers only):.....	18
5.11.2	Sloping ground:	19
5.11.3	Proximity to rolling & static loads:	19
5.12	Additional accessories.....	20
5.12.1	Grease trap	20
5.12.2	Sampling chamber	20
6	Capsule installation.....	21

7	Commissioning	21
7.1	Control panel start-up.....	22
7.2	Operation of the control panel.....	24
7.2.1	Basic screen display.....	24
7.2.2	Start-up phase 'Start 150%.'	25
8	Disposal of treated water.....	26
9	Maintenance	26
9.1	Regular maintenance	26
9.2	Annual maintenance.....	26
9.3	Annual service(available from your supplier).....	27
9.4	Production of sludge	27
9.5	Desludging (emptying the solid waste from the primary chamber).....	27
10	Operating conditions	28
11	Troubleshooting.....	30
11.1	Odours	31
12	Certification	32
12.1	Declaration of performance	32
13	Terms & conditions	36

1 Health & safety precautions

Reading the full technical manual prior to installation is important. Retain this document for the lifetime of the product and in the event of a change of ownership of the site, transfer to the new owner. As health and safety are of vital importance, the following aspects are critical:

Precaution

Prior to installing, please consider the finished garden level. If you envisage that a manhole riser/extension may be required to ensure manhole cover remains above finished ground level, the plant must be installed with the appropriate excavation foundation and backfill to accommodate the riser. Please refer to section 5.10, 'Risings.'

1.1 General

- It is important that all of the information contained in this manual be adhered to at all times.
- Treated wastewater is not suitable for human consumption.
- It is important that locks be fitted to the manhole cover to prevent accidental access.
- Manholes are rated to 125kg and are for pedestrian use only.
- Never enter a tank unless qualified to do so.
- Do not use naked flames in the vicinity of the tank due to the danger of combustion.
- The manhole covers shall never be left off of an unattended tank. Always lock the covers of the plant when work gets completed.
- Sewage and sewage effluent can carry micro-organisms and gases harmful to human health. Any person carrying out work on the Vitae must be appropriately trained.
- Suitable protective clothing; including gloves, goggles should be worn at all times. Always remove contaminated clothing and protective equipment after working with sewage treatment plants. Wash hands and face prior to eating, drinking or smoking.
- Lock all manhole covers for safety. Tanks are supplied with three locking points, as shown below. All points should be locked with a suitable locking device to prevent unauthorised access. Locks do not come supplied.



1.2 Electrical maintenance

- All electrical work is to be carried out by a qualified electrician using suitable materials for the application.
- Do not open the Tricel Vitae's electrical unit cover without firstly isolating the mains power.
- Electrical work must be carried out strictly to the manufacturer's instructions and to the relevant national rules for electrical installations.
- When working with machinery/electrical equipment, the proximity of water shall be noted. Electrical equipment shall not be wet when working with it.
- There is the potential danger of falling into the tank during desludging while manholes may be open – take all necessary safety precautions when desludging.

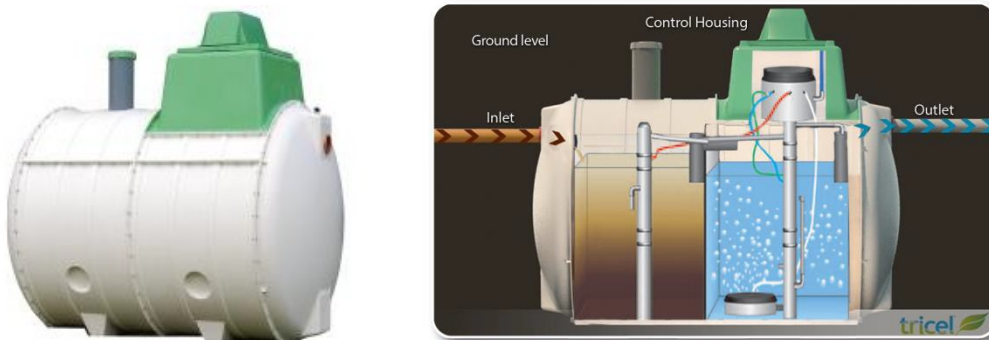
1.3 Installation

- Plan excavation work with due regard to health and safety requirements.
- Excavated material should either be shored or battened back to a "safe" angle.
- Use appropriate lifting equipment.
- Take care around grounds work machinery.
- Keep proper footing and balance at all time.
- It is necessary to vent the Tricel Vitae at the inlet and the outlet of the plant.

2 Introduction: Tricel Vitae

Tricel Vitae wastewater treatment plants are manufactured from sheet moulding compound (SMC) ensuring a durable and high-strength product. They are also constructed from modular components; these modules are then fabricated together to make different size tanks.

The Tricel Vitae is suitable for domestic and light commercial applications and is a sequential batch reactor (SBR). There are two zones in the SBR treatment system. The first is a buffer zone where the wastewater gets stored. From here it is carried into the second zone for treatment in batches. Wastewater is then treated for a set amount of time, after which it is expelled from the tank. As the treatment is for a fixed amount of time in each batch, the water emitted from the tank is to the highest quality standard even in times of high usage.



2.1 The Wastewater purification process

2.1.1 Stage 1: Buffer chamber

The buffer chamber acts primarily as a storage zone to hold the wastewater until it is ready to be treated. This ensures that even in times of low usage there is a constant supply of wastewater to feed the bacteria. While being stored the heavy solids settle to the bottom of the tank and the light particles, like fats or oils, float to the top of the water to create a scum. An airlift pump takes wastewater from the buffer chamber to the aeration chamber in batches at the beginning of the aeration cycle. The airlifter is designed to ensure that only the wastewater from the centre of the chamber gets transferred into the aeration chamber.

2.1.2 Stage 2: Aeration (treatment) chamber

This stage of the process takes place in the second chamber where submerged aeration combines the principles of the biofilm and activated sludge processes. Masses of naturally occurring bacteria form in clumps at the bottom of the chamber. These bacteria get sustained with air delivered by means of an aerator at the bottom of the tank which turns on intermittently throughout the cycle.

After the aeration takes place, there is a settling phase in which the aerator is turned off for 1.5 -2 hours. This process allows for the solids and the bacteria to settle to the bottom of the chamber. As a result, the water above is cleared of any solid particles before it gets expelled from the tank.

During the settlement phase, the batch of liquid is kept in this chamber for a set amount of time and then expelled from the tank using the clearwater lifter. Simultaneously, the excess sludge lifter recirculates the excess sludge from the tank back to the primary chamber. Doing so ensures that there is a constant level of sludge in the primary chamber to feed into the aerated zone.

The clearwater enters the sampling pot before leaving the tank. Doing so allows for the water to get tested for purity. The remaining treated liquid now meets the required standard to be safely passed out of the Tricel Vitae unit.

3 Tricel Vitae specification

3.1 Dimensions

Tricel Vitae: certified to EN 12566-3:2005

Tricel Vitae		UK6
Maximum treatment capacity	PE	6
Design flow rate (max)	litres/day	900
BOD load (max)	kg/day	0.36
Primary chamber volume	litres	2630
Total capacity	litres	4078
Nominal Inlet pipe diameter	mm	110
Nominal Outlet pipe diameter	mm	110
Overall length	m	2.6
Overall width	m	1.64
Overall height	m	2.24
Inlet invert to base	m	1.4
Outlet invert to base	m	1.3
Inlet invert to ground level	m	0.51
Outlet invert to ground level	m	0.61
Weight empty**	kg	300
No. of persons		1-6
Air blower rating (mean)	W	86
Thickness (minimum)	mm	5
Desludge period (minimum)***	year	1.5 – 3
No. of Diffusers	Units	1

** Allow 100kg extra for lifting purposes

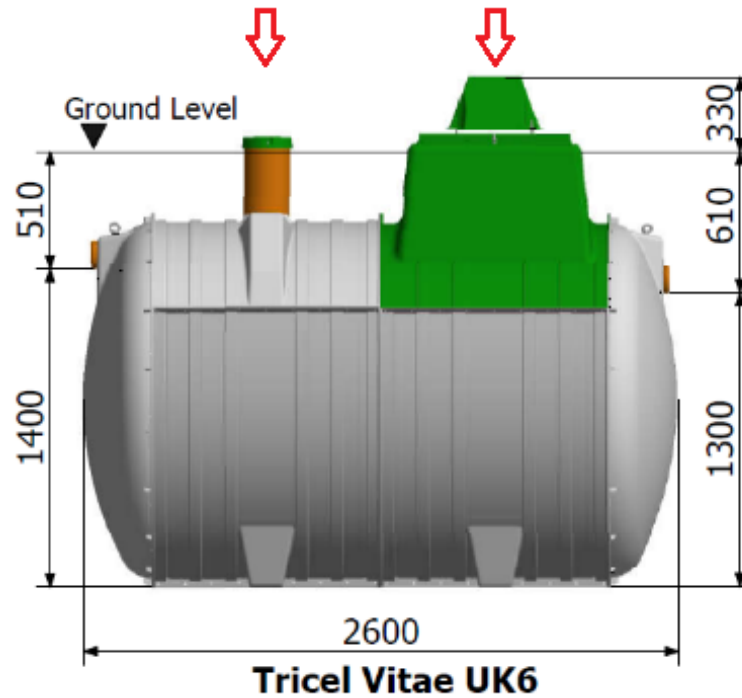
*** Depending on use & design value

3.2 Tank drawing



The arrow indicates an access point which must be opened to facilitate the desludging of the primary chamber. **However, do not desludge the reactor/aeration chamber as this will affect the treatment efficiency of the plant.**

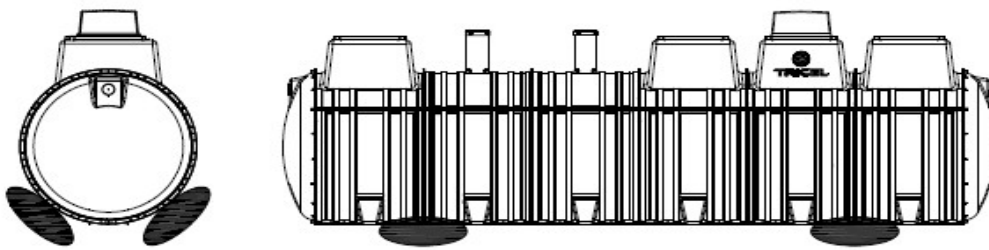
WARNING: care must be taken not to damage pipework when desludging the tank



4 Transportation & lifting

4.1 Transportation

- Tanks must be held down during transportation using nylon straps, do not use cables or chains to secure tanks. Do not over tighten straps that can result in deformation of the tank shell. Do not drop or roll tanks from the truck.
- Move tanks only by lifting and setting, do not drag or roll.
- Always set the tank(s) on flat, smooth ground clear of debris. In order to prevent movement, tanks may need to be tied down and chocked. Position the chocks in the locations shown below:

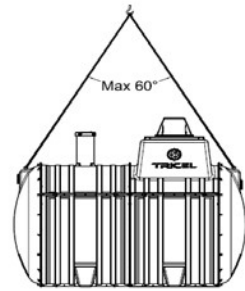


4.2 Lifting

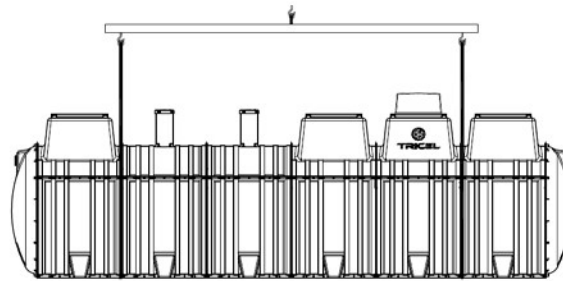
- A machine and webbing lifting straps best lift tanks – do not use chains or wire ropes in contact with the tank.
- Ensure tank is empty when lifting.
- Tanks from one to four modules (4.6m) in length should be lifted using the eyebolts on the tank. Ensure the angle between the slings is not greater than 60° when lifting the tank. In order to ensure the angle is not greater than 60° the following sling lengths are required:

Length of tank	Minimum length of the sling
2.1	2.1
2.6	2.6
3.1	3.1
3.6	3.6
4.6	4.6

Ensure sufficient lifting height can be achieved and is available on site. If not a lifting bar, as per option two below, is required.



Option 1



Option 2

5 Installation

5.1 Installation planning

Important

Before the installation of the Tricel Vitae, it is important to read these instructions carefully.
--

- When planning the installation of a Tricel Vitae, you must consider the following:

Backfill considerations:

- Is this a dry or wet site, i.e. the presence of a water table?
- Which backfill material is appropriate for this site?
- What will the finished ground level be and will risers be required?

Site considerations:

- Is the site restricted regarding area or height?
 - What is the topography of the site, i.e. being it sloping or flat?
 - What is the proposed depth of the installed tank to ensure the required slope upstream?
 - Are static or rolling loads present on this site?
- Only suitably qualified personnel should install the Tricel Vitae.
 - Suitably sized equipment will be required to excavate the hole and to lift the Tricel Vitae into place.

5.2 Inspection on reception of tanks

- Visually inspect tanks for damage or fractures to the shell or ribs, de-laminations, scratches, or abrasions deeper than 1.5mm, which may have occurred during transport, prior to installation. Notify the delivery driver and/or your supplier of any found. Do not attempt to carry out any unauthorised repairs, as this will invalidate the warranty on the tank.
- Once installed, Tricel cannot accept any claims for damage to the tank.

5.3 Positioning and precautions

- The Tricel Vitae should not get installed in an area subject to flooding or excessive water runoff as no flood waters should enter the tank.
- The area around the Tricel Vitae should be adequately drained to permanently remove groundwater and surface water from proximity to the tank.
- The Tricel Vitae is not suitable to be used in water-logged sites where the groundwater may rise above the inlet pipe.
- When selecting the location of the Tricel Vitae, ensure that it is always accessible for future maintenance.
- The Tricel Vitae must be vented at the outlet and the inlet of the plant.

5.4 Types of installation

All installations must be “fit for purpose” to suit the on-site conditions, which will vary from site to site. Ensuring this is the responsibility of the on-site contractor.

When installing a Tricel Vitae, there are two types of standard installation methods:

1. **Gravel installation**
2. **Concrete installation**

It is essential to consider two factors when determining which installation must be implemented:

1. Is the Tricel Vitae being installed in a ‘dry site’ or a ‘wet site’?

- A ‘dry site’ is a site in which the water table never rises higher than the base of the tank.
- A ‘wet site’ is a site in which the water table may rise higher than the base of the tank but will not climb higher than the invert of the inlet. Where a higher water level is present on site, ensure that the installation is suitable for the site conditions.

Tricel strongly advises the installation of a vertical water table inspection pipe. This inspection pipe will facilitate convenient monitoring of the water table long after the installation is complete.

Note: In difficult soils (e.g., clay with a high t-value), a site could be potentially classified as wet if there is no drainage for surface water that enters the

excavation and it rises higher than the base of the tank. The installer must determine this when selecting the correct backfill.

2. Is a riser required (inlet invert >510mm from ground level), and if yes, what height riser is necessary? (For more information on risers, please refer to section 5.10, 'Risers').

The following table specifies the required installation for on-site conditions:

Factors that determine the required installation		Installation required
Type of site	Riser required	
Dry	None	Gravel
Dry	250mm	Gravel
Dry	500mm & 750mm	Concrete
Wet	None	Concrete
Wet	250mm, 500mm & 750mm	Concrete

Important
<ul style="list-style-type: none"> • Incorrectly installed tanks that are subject to movement, rotation, excessive loading or floatation may become damaged, for which Tricel cannot accept liability. • During installation, tanks must not be subjected to buoyant forces. • Contact a qualified engineer if there are difficulties on site due to adverse waterlogging. • Ballasting the tank is essential to avoid the tank from lifting when backfilling.

5.5 Installation procedure: Tricel Tanks

5.5.1 Excavation (dry & wet sites):

5.5.1.1 Excavation: length & width

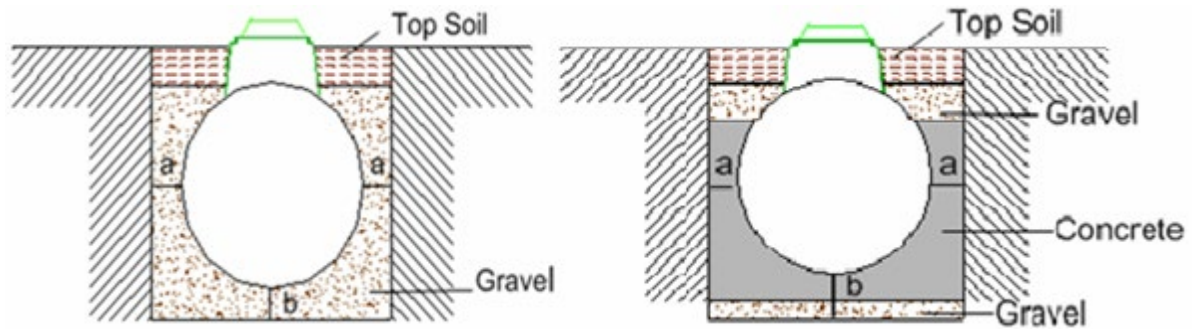
Length and width of the excavation must exceed the dimensions of the Tricel Vitae by at least 500mm to maintain a minimum space of 250mm all around the tank.

Tricel Vitae	UK6
Tank length (m)	2.6
Tank width (m)	1.64
Excavation size (L x W) (m)	3.1 x 2.14

Note: The size of the area for excavation applies to both dry and wet sites. However, unstable ground including regions with excessive sand, peat swamps, etc., may require larger excavations. The excavation should be maintained dry by pumping or whatever suitable means.

5.5.1.2 Excavation: depth

The inlet and outlet pipes determine the excavation depth, invert levels are relative to the bottom of the tank and allowing for the minimum base thickness. Dimension details of the tank provided on the relevant drawing; please refer to section 3, 'Tricel Vitae Specification.' Ground instability, e.g. running sand may necessitate over-excavation and stabilisation with hard core or blinding concrete. The standard depth of the excavation for both gravel and concrete installations are outlined as follows:



	"a" minimum (mm)	"b" minimum (mm)
Dry site	250	250
Wet site	250	300

5.5.2 Step by step – installation procedure

Steps		Installation required (post-excavation)	
		Gravel	Concrete
Installation of the tank base:	1	Remove any soft spots or large stones and boulders.	
	2	The base is constructed of a 250mm layer of suitably compacted gravel.	The base is constructed of a 50mm layer of suitably compacted gravel, covered with a 250mm layer of semi-dry concrete.
	3	Ensure that base is level and at the correct height to accommodate the incoming pipework.	
	4		It is important to maintain a completely dry excavation until the final pour of concrete is set. It may be necessary to line the excavation with a continuous layer of 1200-gauge polythene to maintain the integrity of the concrete.
How to position the tank on to the base:	5	Mechanically lift the plant carefully into the centre of the hole and place on the prepared base.	Mechanically lift the plant carefully into the centre of the hole.
	6	The plant must sit level on the base.	
	7	Connect and seal the pipework to the tank.	
Backfilling around the tank:	8	Ballast the plant by filling each chamber with clean water to a depth of 300mm and recheck the pipework levels.	
	9	Commence backfilling with gravel in layers of 225mm evenly around the tank ensuring that there are no voids until gravel has reached 50mm over the cylindrical body of the tank. Compact each layer in succession. *	Commence backfilling with concrete in layers evenly around the tank, ensuring that there are no voids until it has reached the outlet invert. Continue backfilling with gravel, until it has reached 50mm over the cylindrical body of the tank. *
		Note * Continue filling the chambers with water while backfilling, ensure that the rising water level is no more than 300mm above the backfill level.	
	10	Mount and seal manhole risers (if required). Please refer to section 5.10, 'Risers.'	
	11	Complete backfilling with topsoil up to the max ground level. Allow for subsequent settlement of topsoil.	
		Note <i>The use of geotextile barrier fabrics over the gravel backfill is considered good installation practice. The fabric must be chosen to allow the flow of water in and out of the excavation but to prevent the movement of fine soil particles into the gravel backfill.</i>	

5.6 Gravel specification

Primary backfill specification:

- Primary backfill material should be free-flowing granular material.
- Compaction should be by lightweight rollers or vibratory plate. Compact gravel evenly to ensure proper support for the tank. Make sure the vibrating machine does not come in contact with the shell of the tank.
- Tanks installations require primary backfill only within the region immediately surrounding the tanks. This backfill must extend a minimum of 250mm outward from the tank, and directly beneath the tank.
- Backfill material shall not be frozen or contain lumps of frozen material at any time during installation.
- Use of other than specified backfill and bedding materials will void the tank warranty.

The following materials are approved as primary backfill:

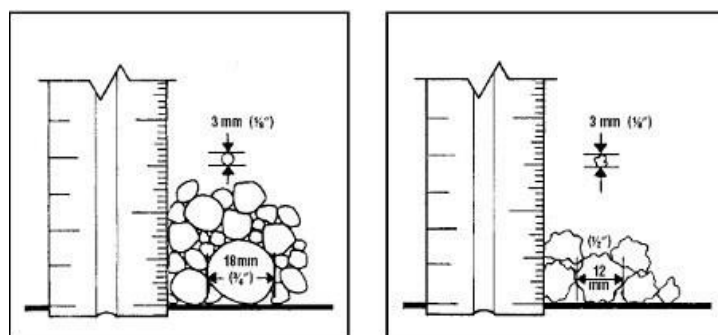
Rounded pea gravel:

- Minimum particle size 3mm, maximum 18 mm, compacted to a relative density of >70%.
- 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 2.36 mm sieve.

Or

Crushed or processed stone:

- Minimum particle size 3 mm, maximum 12 mm, compacted to a relative density of >40%.
- Dry gravel density must be at least 1500 kg/m³. 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 2.36 mm sieve.



Pea Gravel

Crushed Stone

5.7 Concrete specification

Semi dry concrete 25n grade with a ratio of 4.5 aggregate to 1 cement.

Important:

- Do not use standard concrete mixes where sulphates or similarly aggressive chemicals are present in the groundwater.
- **Lift height (rate of rise):** Determine the lift height (m), or rate of rise (m/h) for the specific, concrete type used, to ensure that a design pressure (P max) of 15kN/m² on the tank does not get exceeded.
- **Vibration:** The tank design assumes minimal compaction of the surrounding concrete. Where necessary, this may be extended to include internal light vibration. Never use deep revibration which will substantially increase the pressure on the tank, possibly causing failure.
- **Impact of concrete on discharge:** Under no circumstances should concrete be discharged directly onto the tank.

5.8 Topsoil requirements

Clean native topsoil shall not contain rocks larger than 36mm on largest dimension.

5.9 Electrical requirements

Important

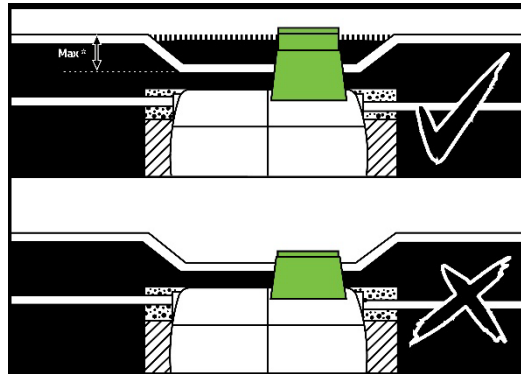
- Please ensure the electrical installation complies with all national regulations and requirements.
- Electrical installations must be carried out by a qualified and certified electrician.
- Please note different electrical requirements are dependant on the size of the Tricel Vitae system, read the following sections carefully.

The customers' minimum responsibility shall consist of:

- A single run of 1.5mm² three core (two conductors plus earth conductor) steel wire armoured (SWA) cable from the customer's distribution cabinet to the tank unit socket box.
- Cable protection via 10-amp MCB protected by (RCD), rated 230V, 30mA.
- Bond the cable armour properly to the main earth at the premises.
- Never disconnect the power to the air pump. It is imperative that it be running 24 hours a day, every day.

5.10 Risers

In the event that a Tricel Vitae requires a deeper than standard installation to align with the wastewater outlet from the premises, manhole risers are available. These are to avoid the access cover being positioning in a depression, as shown in the following diagram:



- **250mm, 500mm, and 750mm** risers are available for the Tricel Vitae if required (requires installation suitable for the site conditions, please refer to section 5.4, 'Types of installation').
- The Tricel Vitae is suitable for a manhole riser which gives a maximum inlet invert of 1260mm. However, the Tricel Vitae is not suited to areas where a more in-depth installation is necessary.

Important:

- Never place the manhole covers below ground level.
- Only use Tricel manhole covers and risers.
- Do not allow ground water to enter the plant.

5.11 Non-standard

5.11.1 Alternative to concrete backfill (for wet sites without risers only):

- The option of securing the Tricel Vitae to a reinforced concrete slab or Deadman anchor by way of straps may also be applied, as shown below:



- **Tricel accepts no responsibility for the design of the concrete slab/Deadman anchor.** This solution should be designed by an on-site structural engineer to suit site conditions.
- If implemented, position the straps as close to the bolted joints as possible.

5.11.2 Sloping ground:

When the slope of the ground is 5% or more, it is recommended to install a retaining wall to protect the tank from the lateral thrust. Concrete backfill may also in some cases be sufficient to protect the tank. A qualified structural engineer must determine if a retaining wall is required in the presence of a steep slope as shown in the picture below:



5.11.3 Proximity to rolling & static loads:

Minimum separation distances from:

- Rolling loads (e.g., vehicle traffic): 4 metres
- Static loads (e.g., dwelling house, shed): 3 metres

If the tank installation is in an area where traffic or other superimposed loadings can be applied, consult a structural engineer for the design of a reinforced concrete slab to prevent any load getting transferred to the tank (or its concrete surround). If this slab is constructed immediately above the tank, separate it from the surrounding concrete by a compressible material.

5.12 Additional accessories

5.12.1 Grease trap

- Best practice indicates that a grease trap gets fitted before the Tricel Vitae, particularly in applications where high quantities of grease/oil exist in the wastewater.
- For the grease trap to continue to perform effectively, it must be monitored/maintained on a regular basis and emptied when required.

Warning

If high levels of grease/oil are present within the Tricel Vitae, the plant will not achieve the required treatment quality and it will reduce the lifespan of plant components.

5.12.2 Sampling chamber

- Best practice indicates that a sampling chamber is fitted after every Tricel Vitae to allow easy access for sampling purposes.
- Care should be taken to ensure that the sampling apparatus does not come into contact with the pipework or walls of the sampling chamber to avoid contamination of the sample.
- Ensure that the outlet is installed high enough in the sampling chamber to allow for the required sampling volume to be retained in the bottom of the sampling chamber.
- The inlet/outlet pipework installed in the sampling chamber must be minimum diameter of 110mm.

6 Capsule installation

Installation of the capsule should only take place after the tank is installed within the ground. Connect the air hoses to the corresponding coloured hoses on the capsule by means of the black clips supplied. The capsule should then be mounted onto the shaft on the clearwater lifter (blue) in the aeration chamber.

Following this, rotate so that the hoses wind around the capsule. Do not cut the hosing as they need to be long enough to allow the removal of the capsule from the tank during times of inspection. Winding the hoses around the capsule helps manage the excess length.

Plug the vent hose (red and blue striped) into the connection located on the bottom of the access cover. The cable coming from the control panel should now be plugged into the plug socket provided, which should be wired up to the house using the wiring diagram, also provided.

7 Commissioning

Once site installation, plumbing and the electrical installation reach completion, the Tricel Vitae is now operational. The plant should already be half filled with water during the installation phase. If not, it should be half filled before its first use.

The start-up instructions for the control panel are below. All plants come fitted with an alarm which will alert to irregularities in the system. This alarm will continue sounding as long as the problem is occurring, or until manually muted.

The plant runs 24 hours a day, seven days a week, all year round for optimum purification. In periods of low occupancy, the sludge return re-circulates the liquid in the system ensuring continuous performance. In periods of overload the sludge return system passes the effluent back into the primary chamber, so it passes through the aeration chamber again which ensures continuous performance. It may take up to 13 weeks for the biomass to become fully established and to reach optimum purification.

As stated previously, all plants come fitted with an alarm which will alert to any irregularities in the system.

7.1 Control panel start-up

Plug the cable into the control panel.

Switch on the control panel.

Once on, a few settings should get verified. The control panel will “beep” until the input of the password.

Below is a guide to help with the settings:

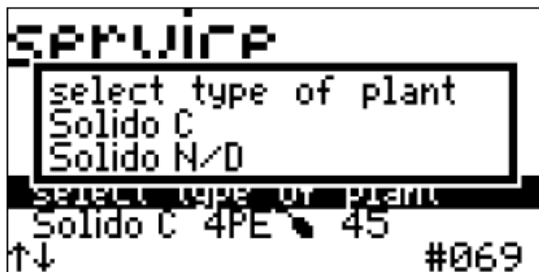
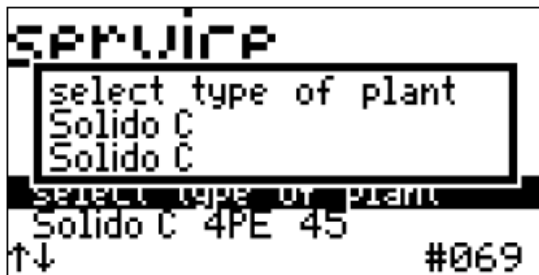
Set important plant parameters during start-up. All of the three-line pop-up menus have the same structure:

First line: Title (which parameter is being set?)

Second line: Current setting

Third line: New setting if required (select using arrow buttons)

Example:



The following parameters are requested in the following order, using the same logic:

SOLIDO:

Language:	Select English
Set time and date:	Set the current time and date
Password:	Commissioning password is 7682
Type of plant:	Select SOLIDO N/D
Number of Persons:	Input the number of normal residents in your property (between 2 and 6)
Compressor:	80 l/min
Winter-eco:	No
Test mode:	The control unit switches on each of the lifters in turn; press any button to end the test run.
Settings ok:	Yes/No?(Yes:operation starts,No:backtothefactorydefaultstate)
Test mode:	The basic screen then appears, and the control unit starts the first cycle.



Green LED, top: Indicates operational readiness (connected to the mains)

Red LED, bottom: Flashes to indicate an alarm message

Note: After commissioning start-up phase "start 150%" will be automatically activated, then during 120 days the aeration time is increased to 150% of set value.

7.2 Operation of the control panel

7.2.1 Basic screen display

The basic screen is one of a number of layers of the same level which form the menu; you can navigate between the layers using the arrow buttons.

```
operat. hours
compressor: 00002h40min
BEL:       00002h04min
BSH:       00000h18min
KWH:       00000h07min
total:     00012h38min
eco:       00007h51min
↵=weeks
```

```
system
set time
LCD-contrast: 32
alarm pause: 20h-08h
display errors
Language English
↵=enter menu #048
```

Alarm pause: Night's rest of the acoustical alarm, hangeable

```
service
test mode
manual mode
clear counter
select type of plant
Solido C 4PE 45
↵=enter men
```

```
settings 1
BSH normal: 14.4min
BEL normal: 15.1min
KWH normal: 18.0min

Start150% 117 d
↵=enter menu #080
```

Start150%: start-up phase, aeration time at 150% of et value, duration adjustable


```

settings 2
BSH eco:          11.3min
BEL eco:          05.8min
KWH eco:          05.8min

↵=enter menu      #096

```

```

holiday
remaining: 00d 00h
activate holiday mode
stop holiday mode

↵=enter menu      #112

```

Holiday: Max. 30 days can be set, plant then only runs in conomy mode

```

current monitor
compressor off

↵=enter menu      #128

```

```

information
compressor:      on
valve BSH:      off
valve BEL:      off
valve KWH:      on
BEL(akt.):      14.7min
current:        0.0A

```

BEL(akt.): Activated aeration time (resp. start-up phase and inter-eco)

Press the middle button to move down a level to the sub-items in a menu. You can read the status on the sub-items which get highlighted in black. The arrow buttons now allow you to select the sub-items of the menu. If none of the sub-items are highlighted in black, you have returned to the screen level above; here, the arrow buttons allow you to navigate between the main menu items. The numbers at the bottom right (e.g. # 144) indicate the menu field (for internal use).

7.2.2 Start-up phase 'Start 150%.'

After commissioning the controller, or changing the plant type, the start-up phase "Start150%" will always be automatically activated. During the next 120 days, the aeration time increases to 150% of settled value. The duration is adjustable. To deactivate the start-up phase just set 0 days, as follows:

```

settings 1
BSH normal:      07.2min
BEL normal:      05.4min
KWH normal:      09.0min

Start150%      120 d
↑↓
#086

```

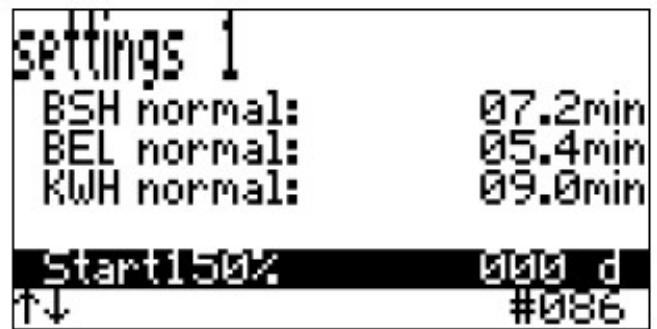
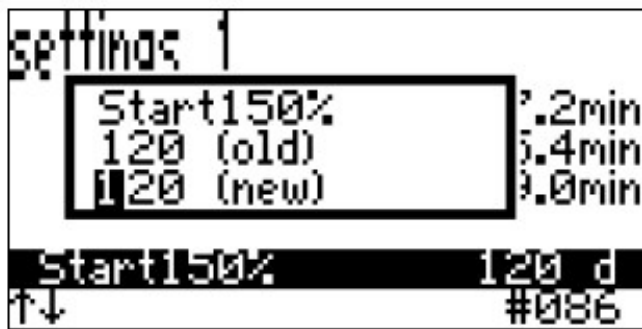
```

settings 1
BSH normal:      07.2min
BEL normal:      05.4min
KWH normal:      09.0min

password
2***

Start150%      120 d
↑↓
#086

```



8 Disposal of treated water

The treated wastewater from the Tricel Vitae should get disposed of as per guidelines from the planning regulations issued by your local authority.

9 Maintenance

Warning

Any maintenance performed inside the tank represents a confined space. Therefore, the maintenance person must be suitably trained to work in confined spaces. Sewage and sewage effluent can carry micro-organisms and gases harmful to human health. Only appropriately trained personnel can carry out maintenance on the tank. Wear suitable protective equipment including gloves, goggles, etc., at all times. Always remove contaminated clothing and protective equipment after completion of work. Wash hands and face prior to eating, drinking or smoking. Please refer to section 1, 'Health & Safety precautions.'

- A certain amount of plant maintenance is required on an on-going basis to ensure that the plant is working correctly.
- Ensuring this maintenance is the responsibility of the homeowner.

9.1 Regular maintenance

- The vents around the base of the blower housing guarantee a fresh supply of air to the air blower. All vents should be checked to make sure they are not blocked or obscured.
- Ensure that the plant is running correctly by removing the blower housing and inspecting the display on the control unit.
- Inspect the pipework for blockages if necessary. The inlet and outlet should be inspected and rodded to remove any obstructions if necessary.

9.2 Annual maintenance

- The Tricel Vitae will require a full service (available from your supplier) once a year to guarantee the efficiency of the plant gets maintained. Accommodating service personnel with clear access to the tanks is essential.

9.3 Annual service (available from your supplier)

During routine servicing, the following items get checked, if applicable:

All plant functions	The functionality of blower(s)
Blower pressures	Replacement of blower filters
Diffusers monitored to check for dispersion of air.	Inspection of Tricel covers and locks
Vents are clear of any blockages.	Clearing air-lifts of any blockages
Measurement of the quantity and condition of bacteria in the aeration chamber	Measurement of sludge level in the primary chambers
Calibration measurement	

9.4 Production of sludge

Important
<ul style="list-style-type: none"> • The desludging of the Tricel Vitae is the responsibility of the homeowner. • There is the potential danger of falling into the tanks during desludging when manholes may be open – take all necessary safety precautions when desludging. • Do not allow machinery/traffic drive over the Tricel Vitae. Maintain a distance of at least 4 metres away from the manhole covers on the Tricel Vitae. • The manhole covers should never be left off an unattended Tricel Vitae.

When the sludge is occupying 50% of the volume of the primary chamber desludging is required. This activity is necessary when the sludge is 700mm deep. View the desludging periods in the table in section 3.1 'Dimensions,' these periods depend on the occupancy of the dwelling. The Tricel Vitae has a separate desludging access point. Desludging is carried out with a vacuum tanker (Tricel recommend the use of a licensed company).

9.5 Desludging (emptying the solid waste from the primary chamber)

- Qualified personnel must perform the desludging.
- Please remove all floating and settled sludge from the primary chamber. All compartments within the primary chamber must be desludged (please refer to section 3.2 'Tank Drawing'). The primary chamber is identifiable by the fact that there is no aeration done in this chamber. Therefore, there will be no air bubbles in these chambers during the aeration function.
- Once the primary chamber has been desludged, fill it with fresh water. When loading the primary chamber with fresh water, place the hose into the primary compartment and position it closest to the aeration chamber. By doing this, it will reduce the risk of floating solids blocking the airlifts.

10 Operating conditions

Warning

Tricel shall not be liable for any damage or loss, including consequential loss, caused by the failure of any plumbing equipment or failure caused by the inclusion of prohibited material, in the plant.

The manufacturer's installation, operation and maintenance instructions outlined in this manual must be followed at all times to ensure the plant operates as designed. Any variations to these conditions could result in the unit not performing to its full potential, and the discharge may not meet the required standards.

- The property owner has a legal responsibility to ensure that the plant does not cause pollution, a health hazard or nuisance.
- Desludging is a critical part of the successful operation of the Tricel Vitae and is the responsibility of the customer. Only competent and approved personnel should carry out desludging. Desludging must get carried out when required as specified, and the plant should be regularly inspected to check the depth of sludge in the primary chamber. If desludging is deemed necessary, carry it out as soon as possible.
- The electrical connection to the plant requires maintaining for it to function correctly. This connection ensures that the plant has a continuous air supply and where necessary the airlifts will operate.
- The Tricel Vitae is one part of an overall wastewater treatment system which includes many components (plumbing, ventilation, plant and polishing filter (if applicable)). Each element has to function correctly for the overall system to work which is the responsibility of the customer.
- If the installation of the plant is not correctly carried out, flooding, overloading, electrical shock or floatation may occur. Tricel is not responsible for incorrectly installed plants.
- Soakaways drains and the emptying of the primary chamber remains the responsibility of the customer. Damage to the plant, due to the influx of surface water or the backing up of soakaways or drains, is not covered by Tricel.
- To ensure the continuance of the Tricel Vitae's performance, the customer must take certain precautions:
 - Do not exceed the design loading of the plant.
 - High volume discharges, such as those from swimming pools and Jacuzzi's must never enter the plant.
 - Surface water must not enter the plant.
 - Do not allow large quantities of chemicals to enter the plant including but not limited to:
 - Detergent
 - Water softener
 - Disinfectants
 - Strong acids and alkalis, or photographic chemicals
 - Oil or grease
 - Petrol or diesel
 - Pesticides

- Do not allow any of the following to enter the Tricel Vitae:
 - Large quantities of milk, alcohol or food
 - Large amounts of bleaches or cleaners
 - Babywipes, cosmetic and cleaning wipes
 - Sanitary towels
 - Tampons
 - Kitchen paper
 - Nappies
 - Medication

- Service personnel must be provided with clear access to the plant.
- If others size the plant, Tricel will supply to these specifications. In this case, the responsibility lies with others in relation to the maximum flow/litres per day, the plant capacity and retention times. Similarly, if Tricel size the plant and a greater load is placed on the plant, for example, but not limited to the addition of extra houses, bedrooms, schools, crèche's etc. or by other means Tricel is not responsible for the plant regarding overloading or quality of effluent as the retention times may be compromised.
- Safety precautions must never be removed or by-passed during normal operation of the plant.
- When working with chemicals, avoid direct contact with chemicals as far as possible. Before use, always read the instructions and take the relevant precautions where necessary regarding the chemical.
- All safety instructions and danger warning signs located on the plant must always be kept in a readable condition.
- Persons under the influence of alcohol must not operate the plant.
- The power supply to the plant must be turned off during maintenance and cleaning work at the plant.
- It is not permitted to use the system for another purpose other than described by the manufacturer.
- The tank is not suitable for vehicular traffic. Tricel also recommends fencing off the area to prevent livestock herds from accessing the plant.
- Tricel are not responsible for the following, and such occurrences will void the warranty:
 - Unusual use – used for purposes not intended by the manufacturer
 - Flooding
 - Lightning strikes/power surges
 - Tricel does not commission the plant

11 Troubleshooting

Properly installed, operated and maintained plants will give many years of trouble-free service. All plants come fitted with an alarm, which will alert to irregularities in the plant. If a fault occurs, a buzzer will sound to indicate that there is a problem with the plant. If required, you can mute the buzzer by holding the middle touch key on the control unit for 5 seconds, until the problem gets fixed. Once fixed, the alarm will reset automatically. All electrical work shall be carried out by a qualified person.

Symptom	Possible Causes	Solution
The blower will not start or run	Fuse blew (if applicable)	Replace with a fuse of suitable size
	Tripped breaker	Reset breaker
	Low line voltage and wet electrics	An electrician should check the power supply to the plant
	Defective blower	A qualified person must check the blower
	Thermal overload protection triggered by high ambient temperature	Allow the blower time to cool. The blower will automatically restart when cooled sufficiently
Blower operates but delivers no air	Low line voltage or wired incorrectly	An electrician should check the power supply to the plant
	Filter blocked	Replace filter
	Diaphragm damaged/torn (if applicable)	Replace damaged diaphragm
	Defective blower malfunction	A qualified person must check the air blower
Plant fills above the working water level	Subsurface disposal plant clogged	Contact installer to repair subsurface disposal plant/ percolation area
	Stormwater flooding	Redirect stormwater drains. Stormwater must never enter the plant
	Discharge hose/pipe blocked	Find blockage and remove or replace the damaged hose/pipe

11.1 Odours

When the Tricel Vitae gets installed and operated correctly, there should be no strong odour in the area adjacent to the plant. The presence of a strong odour would indicate that the plant is not working effectively.

Note:

Before taking any corrective action, always positively identify the real source of the odour. Check if the odour is coming from another outside source such as a storm drain. All Tricel Vitae's plants vent gases back through soil pipe's and out roof vents. Improperly installed roof vents can cause odour problems. Traps in drains prevent odours from entering the home. To function, they must contain water and be sealed correctly.

Symptom	Possible Causes	Solutions
Strong effluent odour directly outside the house or inside the house	Pipe connections to toilets/drain not connected correctly	Check that the traps/U - bends in the drains are fitted and the joints sealed
	Air vents on pipework not installed correctly	Ensure all effluent pipes are vented correctly. Vents are typically fitted to all pipes, and they should be higher than the eave of the roof.
	Pipework is damaged, blocked or not installed correctly	Inspect pipework to ensure it is undamaged and clear of obstructions or sagging
Strong effluent odour directly over the tank	Pipework to or from the tank is suffering blockage	Check the level of wastewater in the tank. Ensure the pipes are not blocked and are installed correctly to the tank.
	Chemical kill of bacteria	Empty the tanks and fill with fresh water
	No oxygen is entering the tank	Clear any blockages in the vents
	The control unit has detected a fault and stopped running	Resolve the issue and restart the plant
	No power supply to the control unit	Connect the power supply/ replace the fuse
Too much grease is entering the plant	Install/empty grease trap	
Note:	Smoke bombs/pellets, available from a plumber's merchants, can be used to trace the source the odour.	

12 Certification

12.1 Declaration of performance



- Declaration of Performance

DOP02SBRUK06201403

1. Classification of Product:

A small wastewater treatment system for up to 50PT – Packaged and/or Site Assembled Domestic Wastewater Treatment Plant as set out in EN12566 Part3

2. Name of Product:

Tricel Vitae 6

3. Product Characteristics

Material	Glass-Reinforced Plastic (GRP)
Technology	Sequential Batch Reactor
Shape	Horizontal cylinder with domed ends. 620mm x 620mm and Ø200mm Access openings as required.

4. Intended for Use:

To treat light commercial wastewater for up to 6 population equivalents.

5. Name, Address and Contact Information of Manufacturer:

Tricel (Killarney)
Ballyspillane Ind Est
Killarney
Co. Kerry Ireland
Tel: ++353 (0) 64 6632421
Web: www.ie.tricel.eu

6. Plant of Assessment of Verification as set out by the CPR, Annex V:

Plant 2+

7. Name, Address and Notified Body Number of Notified Body who carried out Initial Type Testing

Prüfinstitut für Abwassertechnik GmbH
Hergenrather Weg 30
D-52074 Aachen
Germany
NB 1739

8. Declared Performance: Treatment Performance

Essential Characteristic	Performance*		Harmonized Technical Specification
Nominal Organic Daily Load	0.30 kg/d		
Nominal Hydraulic Daily Load	0.75 m ³ /d		
COD	94.3%	37.3 mg/l	EN12566-3
BOD ₅	98.1%	6.1mg/l	
SS	96.2%	13.8 mg/l	
NH ₄ **	94.2%	2.9mg/l	
Electrical Power Consumption	0.65 kWh/d		

*Performance results obtained at an average organic daily load of 0.25kg/d and a daily hydraulic load of 0.9m³/d

**Determined at temperatures $\geq 12^{\circ}\text{C}$

Material Performance

Essential Characteristic	Method	Performance	Harmonized Technical Specification
Water Tightness	Vacuum Test	Pass	EN12566-3
Crushing Resistance	Pit Test	Pass (also wet conditions)	
Durability		Pass	
Reaction to Fire		Class E	

9. The performance of the product identified in point 2 conforms with the declared performance in Point 8.

This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.



Michael Stack Managing Director
3/06/2014



Tricel (Killarney)
 Ballyspillane Ind Est
 Killarney
 Co. Kerry
 Ireland

13

DOP02SBRUK06201403

EN 12566-3

Packaged wastewater treatment plants
 for treatment of domestic wastewater

- Product: Tricel Vitae 6
- Material: GRP

Notified Body: Prüfinstitut für Abwassertechnik GmbH
 Hergenrather Weg 30
 52074 Aachen

Number.: NB 1739

Treatment capacity

- Nominal organic daily load: (BOD₅)
- Nominal Hydraulic daily flow (Q_N)

As Set Out in
 Table CE
 for each Model

The effectiveness of treatment:

Treatment efficiency ratios (at tested organic daily load
 BOD₅ of 0,25 kg/d and daily hydraulic flow of 0.75m³/d)

COD: 94.3 %
 BOD₅: 98.1 %
 SS: 96.2 %
 NH₄-N: 94.2 %

Water tightness: (Vacuum test)

Pass

Crushing resistance: (Pit test)

Pass (also Wet conditions)

Durability

Pass

Fire Resistance

Class E

The Tricel Vitae wastewater treatment plants have successfully passed the stringent European testing process and are approved to the new European standard EN 12566-3 Small wastewater treatment plants for up to 12 PT-Part 3: Packaged and/or site assembled domestic wastewater treatment plants. Tricel wastewater treatment plants were placed through a rigorous 38-week test, by the certified laboratory PIA GmbH-Testing Institute for wastewater technology in Aachen, Germany www.pia-gmbh.com.

The Tricel Vitae passed all structural testing (crush test & durability test) carried out by PIA staff. Water tightness tests were performed by PIA at our headquarters on the range of tanks up to P12 successfully passed all of the required tests.

13 Terms & conditions

Subject to our standard terms and conditions, which are available on request.

In accordance with our standard policy of product development, this specification is subject to change without notice. (July 2018)

NOTES

This page is intentionally left blank.

NOTES

This page is intentionally left blank.

NOTES

This page is intentionally left blank.

Tricel Identification Code	This Tricel is a	Nominal Organic Daily Load (BOD5) (Kg/day)	Nominal Hydraulic Daily Flow (litres/day)
Tricel Vitae UK6		0.36	900



TRICEL

GENERATIONS OF INNOVATION

Tricel (Killarney) Unlimited Company Trading as Tricel
 Ballyspillane Ind. Est. Killarney, Co. Kerry, Ireland
 Tel: +353 (0)64 663 2421 | Email: sales@tricel.ie | www.tricel.ie

In accordance with Tricel normal policy of product development these specifications are subject to change without notice.