

TRICEL
GENERATIONS OF INNOVATION

Tricel® Novo IE6-50

Wastewater Treatment Plants

Engineering a green future



Contents

1	Health & safety precautions.....	4
1.1	Electrical maintenance	4
1.2	Installation.....	4
2	Introduction: Tricel Novo	5
2.1	Treatment stages.....	5
3	Tricel Novo range	6
3.1	Dimensions	6
3.2	Tank drawings.....	7
3.3	Pumped outlet.....	11
3.3.1	Standard pump specification:	11
3.3.2	Outlet connection:	12
4	Transportation & lifting.....	12
4.1	Lifting tanks of 1-4 modules (max. 4.6m)	13
4.2	Lifting tanks of 5-6 modules (max. 6.6m)	14
5	Installation.....	15
5.1	Installation planning	15
5.2	Inspection on reception of tanks	15
5.3	Positioning and precautions	15
5.4	Types of installation.....	16
5.5	Installation procedure	17
5.5.1	Excavation (dry & wet sites).....	17
5.5.2	Installation – step by step guide	19
5.6	Gravel specification	20
5.7	Concrete specification	21
5.8	Topsoil requirements.....	21
5.9	Risers	21
5.10	Non-standard installations	22
5.10.1	Alternative to concrete backfill (for wet sites without risers only)	22
5.10.2	Sloping ground	23
5.10.3	Proximity to rolling & static loads.....	23
5.11	Electrical requirements	24
5.12	Additional accessories	24
5.12.1	Grease trap	24
5.12.2	Sampling chamber	24
6	Plant operation	25
6.1	Diffuser-manifold calibration (only applicable on plants IE18 and greater).....	25

6.2	Timed sludge-return system (only applicable on plants IE18 and greater)	26
7	Disposal of treated water.....	26
8	Maintenance	26
8.1	Regular maintenance.....	26
8.2	Annual maintenance.....	27
8.3	Annual service(availablefromyoursupplier).....	27
8.4	Production of sludge.....	27
8.5	Desludging (emptying the solid waste from the primary chamber)	27
9	Operating conditions.....	28
10	Troubleshooting	30
10.1	Plant operation.....	30
10.2	Odours	31
11	Certification	32
11.1	Declaration of performance	33
12	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, be transferred to the new owner. As health and safety are of vital importance, the following aspects are critical:

- Ensure adherence to all the information contained in this manual at all times.
- Treated wastewater is not suitable for human consumption.
- It is vital that locks be fitted to the lid 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 an unattended tank. Always lock the manhole covers of the plant when work is complete.
- Sewage and sewage effluent can carry micro-organisms and gases harmful to human health. Only appropriately trained persons can carry out work on the plant. 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 before eating, drinking or smoking.
- Lock all manholes for safety. Tanks are supplied with three locking points, as shown below. All locking points require locking with a suitable lock device to prevent unauthorised access. Locking devices do not come supplied.



1.1 Electrical maintenance

- All electrical work to be carried out by a qualified electrician using suitable materials for the application.
- Do not open the Tricel Novo air-blower housing without first isolating the mains power.
- Electrical work must be carried out strictly to the manufacturer's instructions and comply with the relevant national regulations 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 when manholes may be open – take all necessary safety precaution when desludging.

1.2 Installation

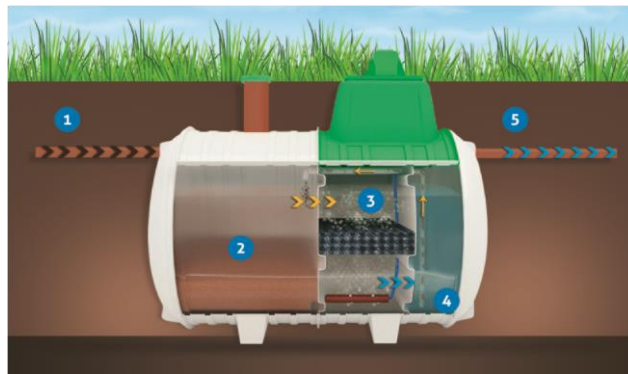
- Plan excavation work with due regard to health and safety requirements.
- Excavated material should either be shored or battened back to a "safe" angle.
- Use appropriate lifting equipment.
- Take care around grounds work machinery.
- Keep proper footing and balance at all time.
- **Treatment plants that require 500mm or 750mm risers need concrete installation. You cannot retrofit 500mm & 750mm risers to tanks with gravel installations.**

2 Introduction: Tricel Novo

Tricel Novo wastewater treatment plants are manufactured from sheet moulding compound (SMC) ensuring a durable and robust product. The Tricel Novo gets manufactured in modular components, and these modules are fabricated together to make various sized tanks.

SMC is a fiberglass-based compression moulded material used in applications that require high strength and durability. Lightweight and compact design facilitate ease of installation for domestic & light commercial applications up to 50PE.

2.1 Treatment stages



Stage 1

Wastewater from the dwelling, toilets, sinks, shower, etc., enters the plant.

Stage 2

Effluent enters the primary settlement chamber. Settlement occurs when the heavier solids drop out of the wastewater and settle to the bottom of the tank to create sludge, and the lighter solids float to the top of the water to form a scum. The top layer acts as a seal and stops odours from escaping. This chamber separates up to 70% of the solids present.

Stage 3

Next is the aeration chamber, where masses of naturally occurring bacteria inhabit specially designed plastic filter media. The bacteria feed on the waste removing it from the liquid. A continuous supply of air from low pressure, high volume compressor in the top section of the unit sustains these bacteria. Wastewater passes through the filter media repeatedly, ensuring a very high treatment efficiency.

Stage 4

The wastewater then proceeds to the final settlement chamber. Any remaining minute bacterial particles separate from the wastewater within this chamber before discharge from the plant. This process slows the liquid's velocity, allowing for any final trace impurities to settle to the bottom of the tank. A sludge return system then returns these impurities to the primary settlement chamber.

Stage 5

The remaining treated wastewater now meets the required standard and is safely passed out of the Tricel Novo plant. The treated effluent is now ready for discharge to a suitably designed discharge area as required by the relevant local authority.

3 Tricel Novo range

3.1 Dimensions

Tricel Novo wastewater treatment plants: certified to EN 12566-3.

Tricel Novo		IE6	IE6+	IE8	IE10	IE12	IE18	IE24
Max. Population Equivalent	PE	6	6	8	10	12	18	24
Design flow rate (max)	litres/day	900	900	1200	1500	1800	2700	3600
Primary chamber capacity	litres	1400	2400	1900	2550	2300	2550	2550
BOD Load (max)	kg/day	0.36	0.36	0.48	0.6	0.72	1.08	1.44
No. of persons		1-6	2-6	3-8	4-10	4-12	6-18	8-24
Nominal inlet/outlet diameter	mm	110	110	110	110	110	110	150
Overall length	m	2.1	2.6	2.6	3.1	3.6	4.6	6.6
Overall width	m	1.64	1.64	1.64	1.64	1.64	1.64	1.64
Overall height	m	2.24	2.24	2.24	2.24	2.27	2.27	2.27
Inlet invert to base	m	1.375	1.375	1.375	1.375	1.375	1.375	1.35
Outlet invert to base	m	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Inlet invert to ground level	m	0.535	0.535	0.535	0.535	0.535	0.535	0.56
Outlet invert to ground level	m	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Height above ground level	m	0.33	0.33	0.33	0.33	0.36	0.36	0.36
Weight empty**	kg	270	300	300	370	400	500	700
Air blower rating (mean)	watts	60	60	80	80	100	200	200
Desludging period (minimum)***	year	1-3	1.5-4	1-3	1-3	1-3	0.5-2	0.4-1
Thickness (minimum)	mm	5	5	5	5	5	5	5

Tricel Novo		IE30*		IE36*		IE42*		IE50*	
		Tank A	Tank B	Tank A	Tank B	Tank A	Tank B	Tank A	Tank B
Max. Population Equivalent	PE	30		36		42		50	
Design flow rate (max)	litres/day	4500		5400		6300		7500	
Primary chamber capacity	litres	3250		3850		4625		5550	
BOD load (max)	kg/day	1.8		2.16		2.52		3	
No. of persons		10-30		13-36		14-42		16-50	
Nominal inlet/outlet diameter	mm	150	150	150	150	150	150	150	150
Overall length	m	2.6	5.6	3.6	6.6	5.6	5.6	6.6	6.6
Overall width	m	1.64	1.64	1.64	1.64	1.64	1.64	1.64	1.64
Overall height	m	2.27	2.27	1.99	2.27	2.27	2.27	2.27	2.27
Inlet invert to base	m	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
Outlet invert to base	m	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Inlet invert to ground level	m	0.46	0.56	0.46	0.56	0.46	0.56	0.46	0.56
Outlet Invert to ground level	m	0.51	0.61	0.51	0.61	0.51	0.61	0.51	0.61
Height above ground level	m	0.18	0.36	0.18	0.36	0.46	0.36	0.46	0.36
Weight empty**	kg	300	600	400	700	600	600	700	700
Air blower rating (mean)	watts	200 + 80		200 + 80		200 x 2		200 + 120 + 80	
Desludging period (minimum)***	year	0.4-1		0.4-1		0.4-1		0.4-1	
Thickness (minimum)	mm	5	5	5	5	5	5	5	5

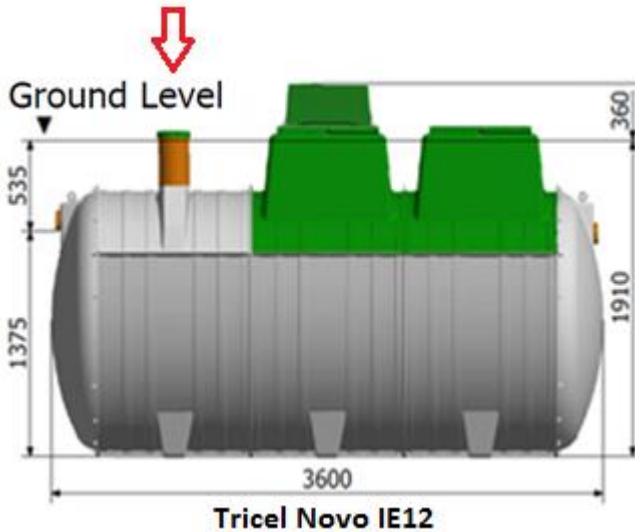
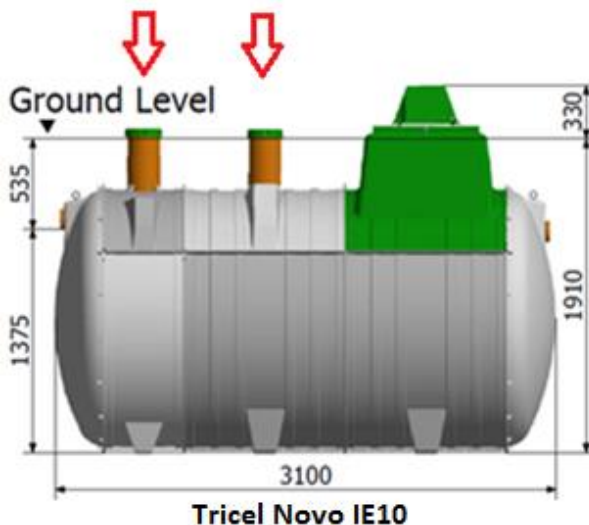
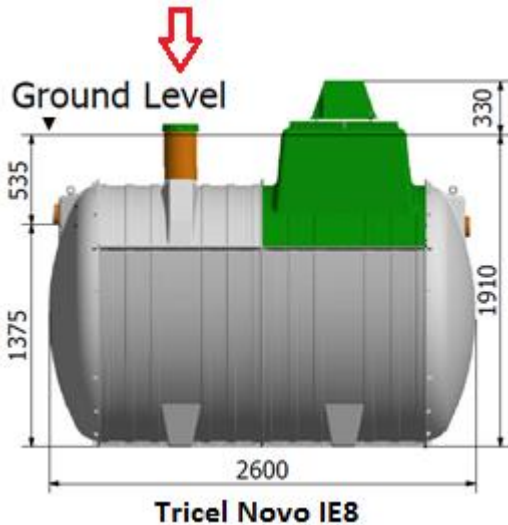
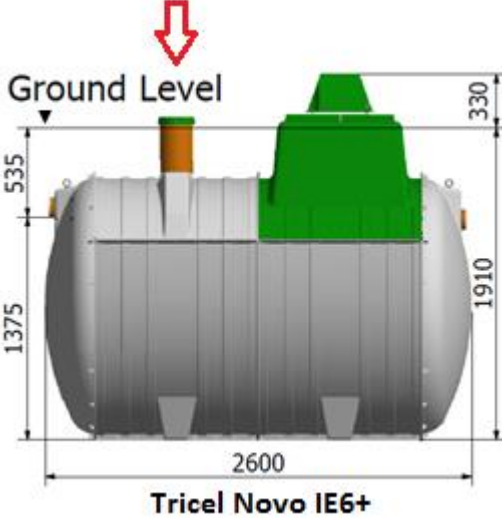
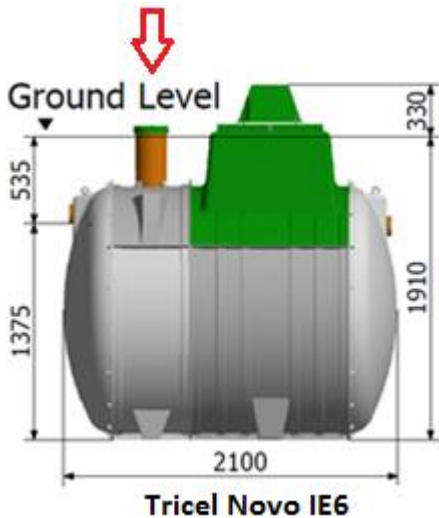
*Tanks may require a stepped foundation, with "Tank B" lower than "Tank A" by 100mm approx.

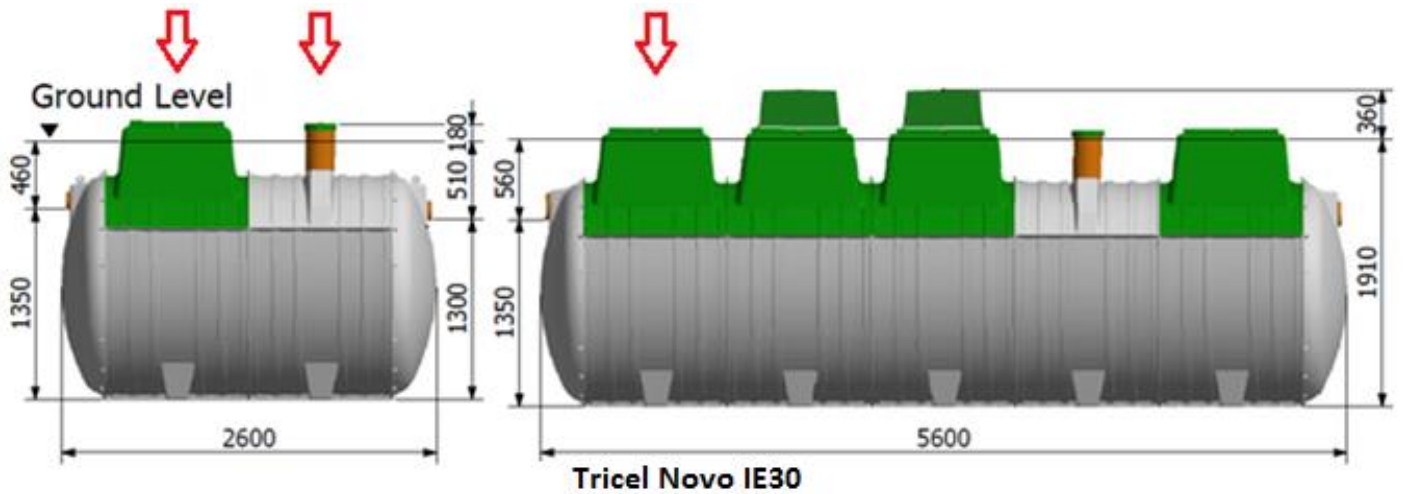
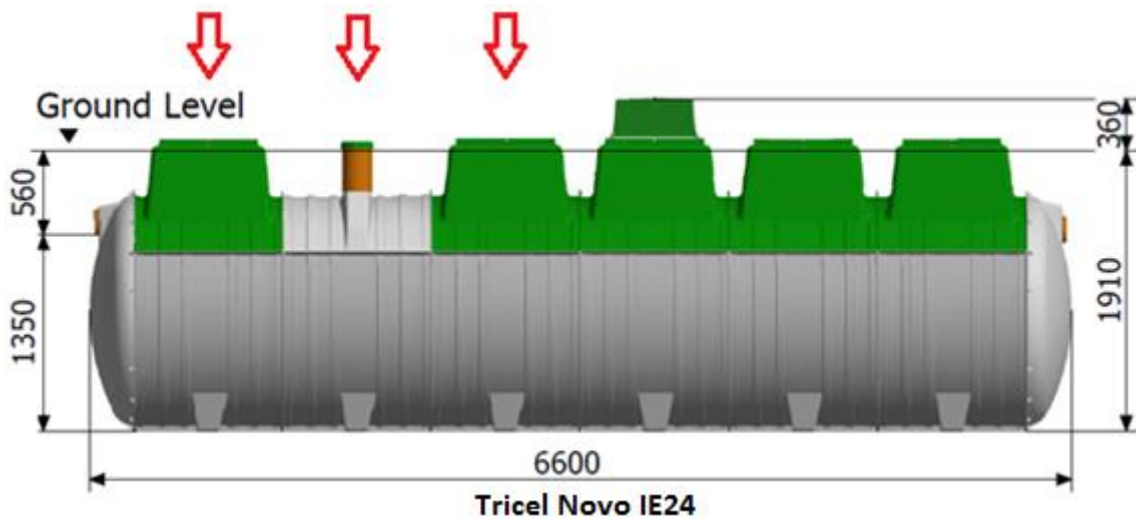
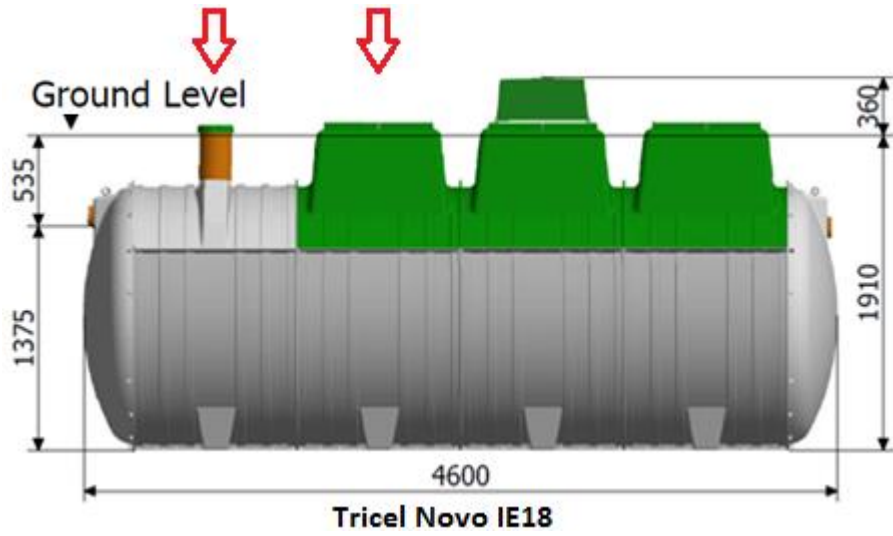
**Allow 100kgs extra for lifting purposes.

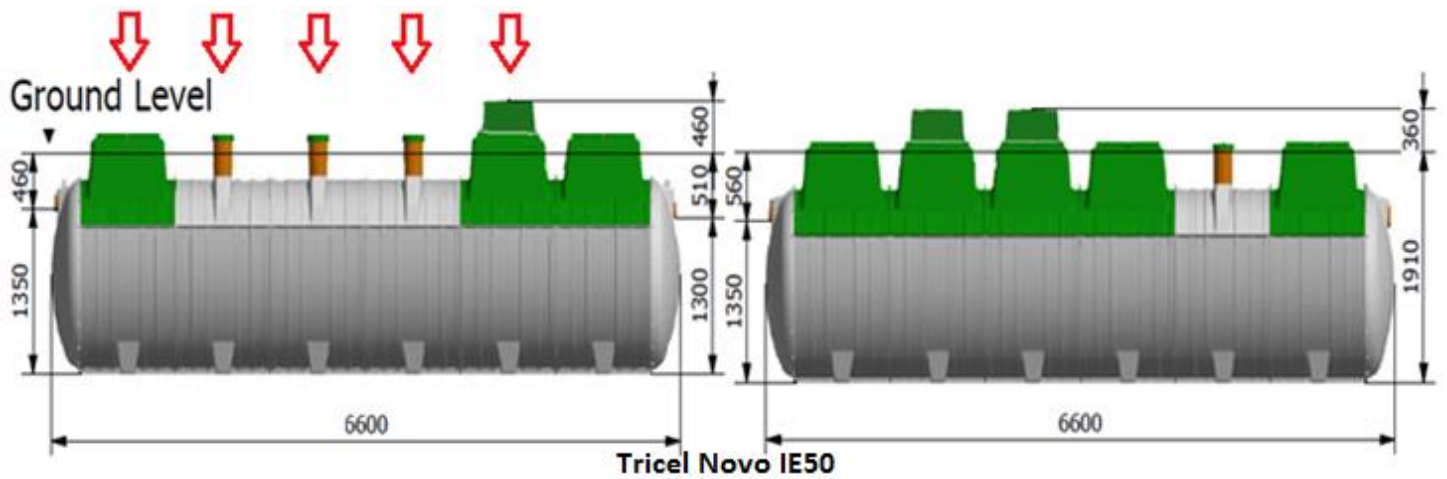
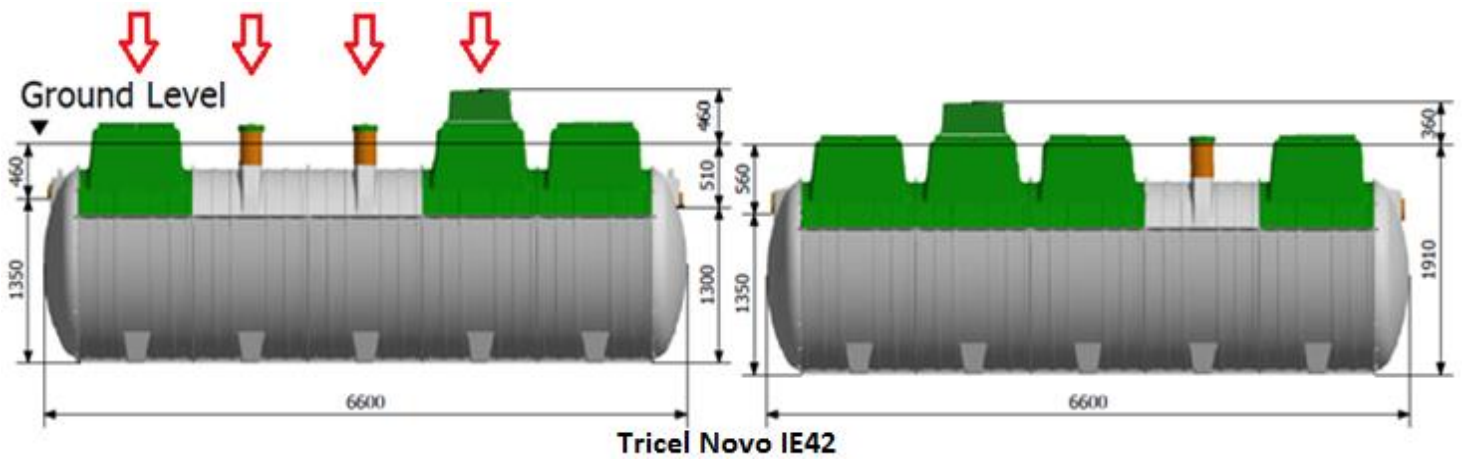
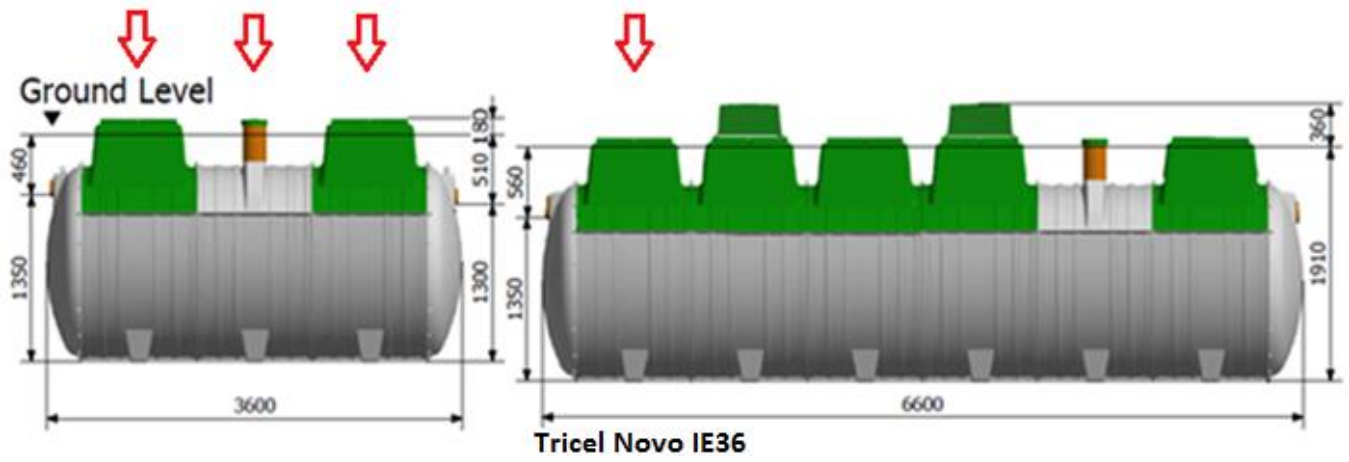
*** Depending on use.

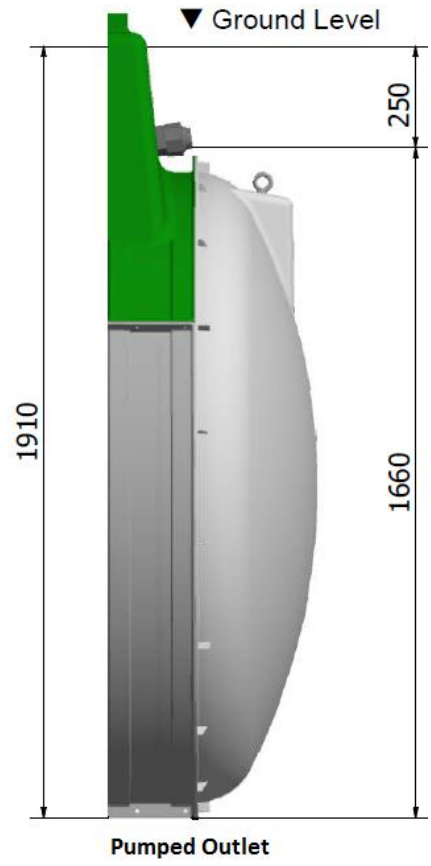
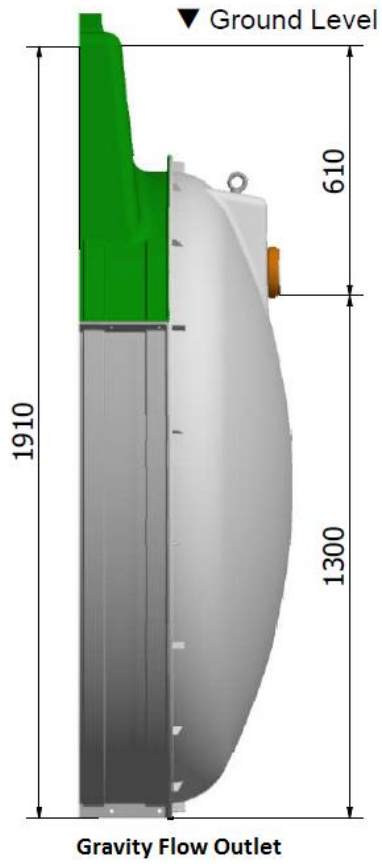
3.2 Tank drawings

↓ The arrow indicates an access point which must be opened to facilitate the desludging of the primary chamber.

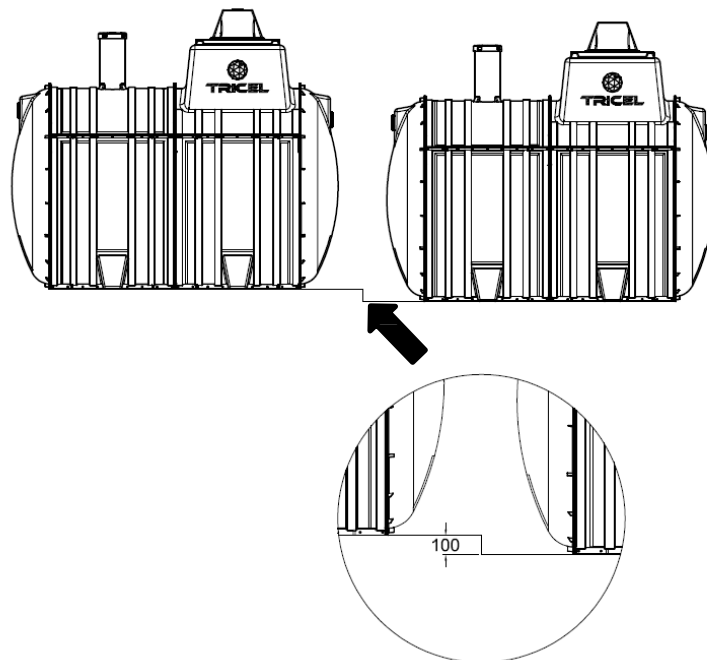








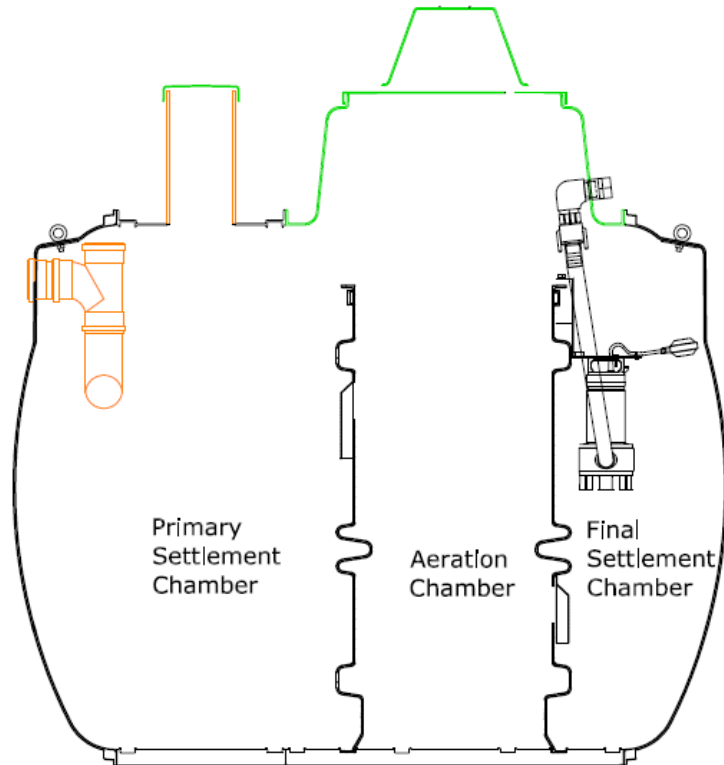
Two-tank Tricel Novo plants require a stepped installation:



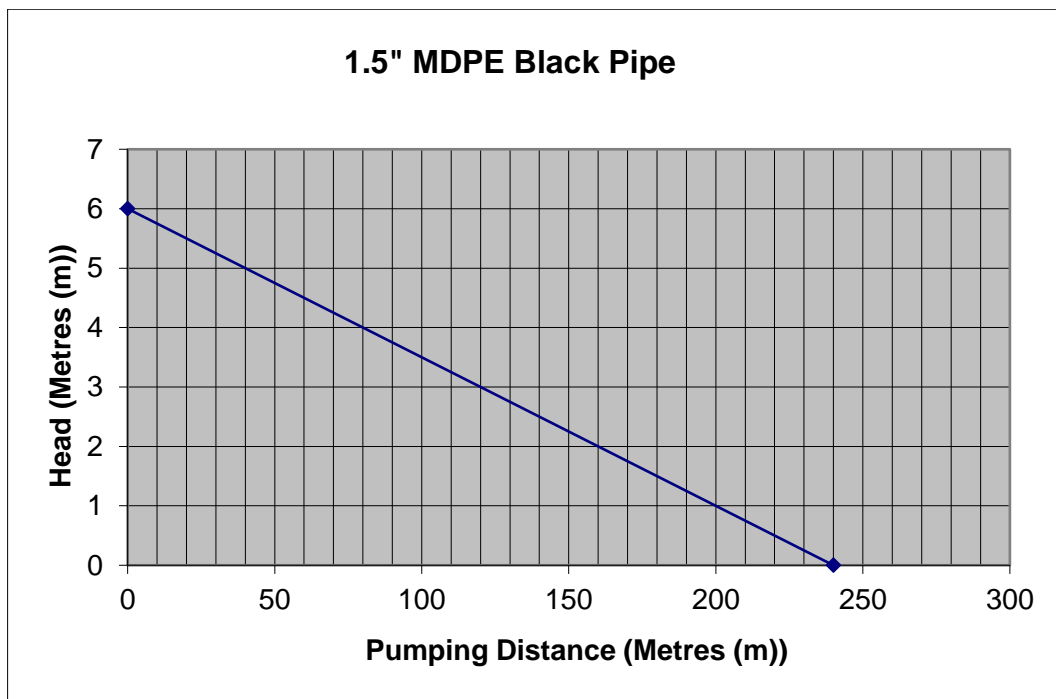
3.3 Pumped outlet

- All Tricel Novos are available with a pumped outlet option. The pump gets housed in the final settlement chamber of the plant.
- Outlined below is the standard pump specification. Other pump options are available to customer specifications if required; please contact your Tricel Novo supplier.

- Min discharge rate: 60 l/min
- Continuous duty with 35°C liquids & fully submerged.
- Dry motor (class F insulation)
- IP68 protection
- Single phase 220-240 V 50 Hz 2 poles
- 0.55 kW for single phase.



3.3.1 Standard pump specification:



3.3.2 Outlet connection:

The Tricel Novo pumped outlet plant has a 1.5" end-connector compression fitting connected to the turret of the Tricel Novo. 1.5" MDPE black piping must be connected to this end-connector compression fitting to transfer the treated wastewater to the discharge point.

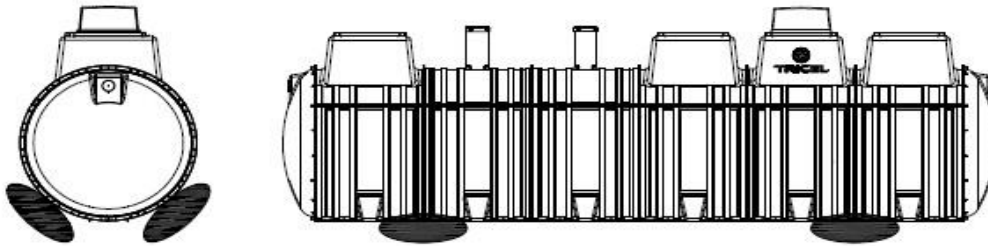


4 Transportation & lifting

- 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.



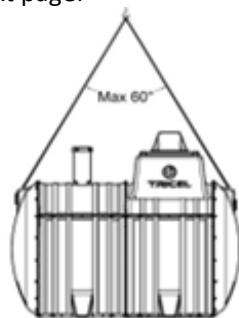
- Always set the tank(s) on flat, smooth ground clear of any debris, etc. Tanks may need to be tied down and chocked to avoid movement. Position the chocks in the locations shown below:



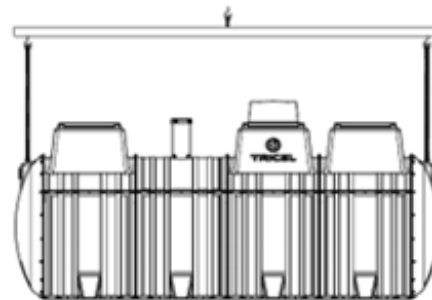
- A machine and webbing lifting straps are best to lift tanks – do not use chains or wire ropes in contact with the tank.
- Ensure tank is empty when lifting.
- Care is needed to control the lift to ensure the tank is not damaged.
- Ensure the slings are positioned at a joint on the tank, firmly secured and the load is evenly balanced.

4.1 Lifting tanks of 1-4 modules (max. 4.6m)

- Tanks up to 4.6m in length should be lifted using the eyebolts on the tank.
- Tanks up to 4.6m in length can be lifted using only lifting straps, as shown in option one, next page. However, on sites where lifting height is restricted, a lifting bar should be used as shown in option two, next page:



Option 1

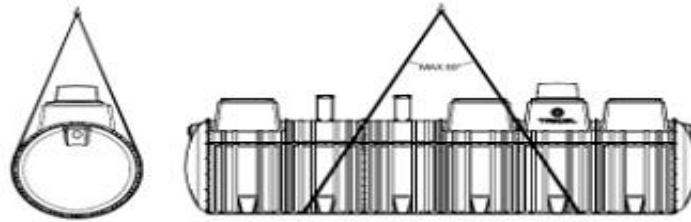


Option 2

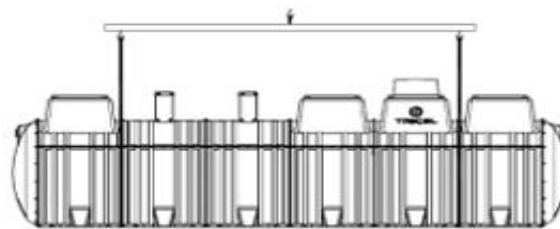
- To ensure the angle of the sling is not greater than 60°, as per option one above, the following sling lengths are required:

4.2 Lifting tanks of 5-6 modules (max. 6.6m)

- Tanks which consist of more than four modules (4.6m) in length should be lifted using the slings provided as shown in option three below. However, on sites where lifting height is restricted, a lifting bar should be used as shown in option four (see next page):



Option 3



Option 4

Length of tank	Minimum length of sling
2.1	2.1
2.6	2.6
3.1	3.1
3.6	3.6
4.6	4.6
5.6	5.6
6.6	6.6

5 Installation

5.1 Installation planning

Important

Prior to the installation of the Tricel wastewater treatment plant, it is essential to read these installation instructions carefully.

You must consider the following when planning the installation of a Tricel Novo plant:

- **Backfill Considerations:**

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

Note: Installations that require 500mm or 750mm risers also need concrete installations. 500mm & 750mm risers cannot get fitted to tanks with gravel installations.

- **Site Considerations:**

- Is the site restricted regarding area or height?
- What is the topography of the site (is 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 Novo.
- Suitably sized equipment will be required to excavate the hole and to lift the Tricel Novo into place.

5.2 Inspection on reception of tanks

- Visually inspect tanks for damage and 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 your supplier of any damage. 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

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

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. This assessment is the responsibility of the onsite contractor.

When installing a wastewater treatment plant, there are two possible installation methods:

1. **Gravel Installation**
2. **Concrete Installation**

Two factors require consideration when determining which installation to implement:

1. Is the Tricel wastewater treatment plant 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 300mm from the base of the tank.
- A **‘wet site’** is a site in which the water table may rise higher than 300mm from the base of the tank. We strongly advise the installation of a vertical water table inspection pipe. This pipe will facilitate convenient monitoring of the water table long after completion of the installation.

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 300mm above the base of the unit. The installer must determine this when selecting the correct backfill.

2. Is a riser required, and if yes, what height riser is necessary? (For more information on risers, please refer to the section 5.9 ‘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

- Incorrectly installed tanks that are subject to movement, rotation or floatation may become damaged, for which Tricel cannot accept liability.
- During installation, tanks must not get subjected to buoyant forces.
- Contact a qualified engineer if there are difficulties on site due to adverse waterlogging.
- Ballasting the tank is important to avoid the tank from lifting when backfilling.

5.5 Installation procedure

5.5.1 Excavation (dry & wet sites)

Important
All excavation works must be done so under the strictest of supervision and in accordance with all associated construction guidelines.

5.5.1.1 Excavation: length & width

Length and width of the excavation must exceed the dimensions of the Tricel wastewater treatment plant by a **minimum 500mm** to maintain a **minimum space of 250mm** all around the tank.

Note: In gravel installations, it is imperative that the gravel backfill is thoroughly compacted to ensure full support for the tank and that there will be no movement over time.

Tricel Novo		Tank Length (m)	Tank Width (m)	Min. Excavation Size (L x W) (m)
6		2.1	1.64	2.6 x 2.14
6+		2.6	1.64	3.1 x 2.14
8		2.6	1.64	3.1 x 2.14
10		3.1	1.64	3.6 x 2.14
12		3.6	1.64	4.1 x 2.14
18		4.6	1.64	5.1 x 2.14
24		6.6	1.64	7.1 x 2.14
30	Tank A	2.6	1.64	3.1 x 2.14
	Tank B	5.6	1.64	6.1 x 2.14
36	Tank A	3.6	1.64	4.1 x 2.14
	Tank B	6.6	1.64	7.1 x 2.14
42	Tank A	5.6	1.64	6.1 x 2.14
	Tank B	5.6	1.64	6.1 x 2.14
50	Tank A	6.6	1.64	7.1 x 2.14
	Tank B	6.6	1.64	7.1 x 2.14

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

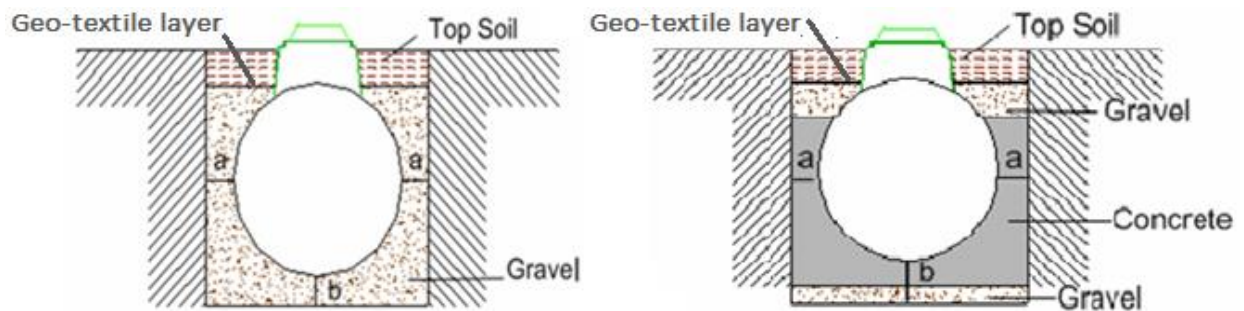
5.5.1.2 Excavation: depth

The outlet pipe determines the depth that the Tricel Novo must get installed from the source of the wastewater.

Please refer to section 5.9 'Risers' to determine the maximum invert level for the Tricel Novo. When a qualified individual is designing the connecting sewer system allowances for maximum inverts are necessary. The Tricel Novo is not suitable where a more in-depth installation is required.

Outlined below are the minimum distances (mm) that the excavation dimensions must exceed the tank dimensions for both concrete and gravel installations. Please refer to section 3.1, 'Dimensions' to view all tank dimensions.

Note: Ground instability, e.g., running sand may necessitate over-excavation and stabilisation with hard core or blinding concrete.



	Tank Width (mm)	"a" minimum (mm)	"b" minimum (mm)
Dry Site	1640	250	250
Wet Site	1640	250	300

5.5.2 Installation – step by step guide

Steps	Installation required		
	Gravel	Concrete	
Installation of the tank base:	1	Remove any soft spots or large stones and boulders.	
	2	Construct the base of a 50mm layer of suitably compacted gravel.	Construct the base 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 becomes set. It may be necessary to line the excavation with a continuous layer of 1200-gauge polythene to maintain the integrity of the concrete.
Positioning of the tank onto the base:	5	Mechanically lift the plant carefully into the centre of the hole and place on the prepared plinth.	Mechanically lift the plant carefully into the centre of the hole before the concrete sets.
	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 in layers evenly around the tank, ensuring that there are no voids until it has reached the invert of the outlet pipe. Continue backfilling with gravel, until it has reached 50mm over the cylindrical body of the tank. *
	<i>* Continue filling the chambers with water while backfilling, ensure that the rising water level is no more than 300mm above the backfill level.</i>		
	10	Mount and seal manhole risers (if used). Please refer to section 5.9 'Risers.'	
	11	Complete backfilling with topsoil up to the max ground level. Allow for subsequent settlement of topsoil.	

Important

A competent person should complete the plumbing to and from the plant in accordance with national regulations and best practices.

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. Ensure the vibrating machine does not come in contact with the shell of the tank.
- Tanks must get installed with primary backfill only within the region immediately surrounding the tanks. This primary backfill must extend a minimum of 250mm outward from the tank, and directly beneath it.
- 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 have approval as primary backfill:

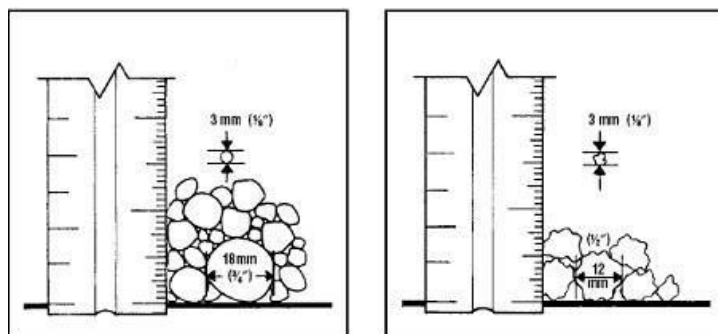
Rounded pea gravel

- Minimum particle size 3mm, maximum 18mm, 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 2.36mm sieve.

Or

Crushed or processed stone

- Minimum particle size 3mm, maximum 12mm, 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 2.36mm sieve.



Pea Gravel

Crushed Stone

5.7 Concrete specification

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

Important:

- Standard concrete mixes should not get used 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.

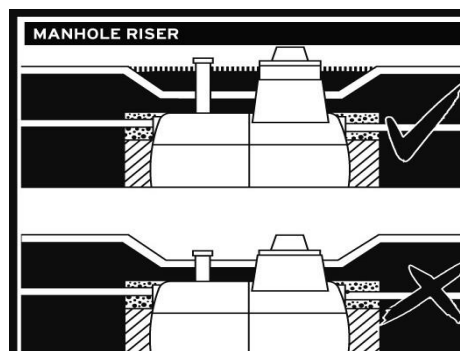
5.8 Topsoil requirements

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

Note: The use of geotextile barrier fabrics surrounding the primary backfill material is considered good installation practice. This 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 primary backfill material.

5.9 Risers

If a Tricel Novo requires a deeper than standard installation to align with the wastewater outlet pipe from the dwelling, manhole risers are available to avoid the access hatch being positioned in a depression, as shown in the diagram below:



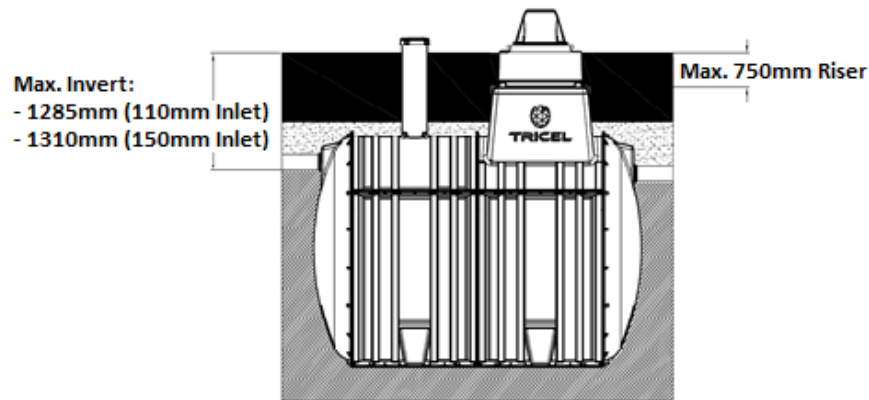
Risers are available in the following sizes:

- **250mm** (requires installation suitable for the site conditions)
- **500mm** (requires a concrete backfill) *
- **750mm** (requires a concrete backfill) *

*** 500mm and 750mm risers cannot get retrofitted unless the correct installation is in place.**

- The Tricel Novo is suitable for a maximum manhole riser of 750mm which facilitates the following maximum inlet inverts:
 - 110mm Inlet: 1285mm
 - 150mm Inlet: 1310mm

- The Tricel Novo is not suitable where a deeper installation is required.



Important:

- Never place the access covers below ground level.
- Only use Tricel manhole covers.
- Do not allow groundwater or stormwater to enter the Tricel Novo.

5.10 Non-standard installations

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

- The option of securing the Tricel Novo 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.
- The straps should get positioned as close to the bolted joints as possible.
- The reinforced concrete slab/deadman anchor must get installed after the level of the groundwater has been lowered, if necessary.
- Once the straps have secured the Tricel Novo, the backfilling with concrete or gravel can commence.

5.10.2 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:



5.10.3 Proximity to rolling & static loads

Minimum separation distances from:

- Rolling Loads (e.g., vehicle traffic): four metres
- Static Loads (e.g., dwelling house, shed): seven metres

If the tank gets installed 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 the transmission of the load to the tank (or its concrete surround). If this slab is constructed immediately above the tank, it should get separated from the concrete surrounding it by a compressible material.

5.11 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.

The customers' minimum responsibility shall consist in the provision of:

- The power supply SWA cable must be suitably sized and comply with all national regulations and requirements. The sizing of the cable is the responsibility of a qualified electrician.
Note: Typical domestic installations require 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.
- The cable armour must be bonded to the main earth correctly.
- Never disconnect the power to the air blower. It is imperative that it be running 24 hours a day, every day.
- In the event that a riser may need fitting at a later date, the qualified electrician must supply an additional one meter of the power supply SWA cable. This extra length of cable should be coiled and hung underneath the manhole cover as shown in the following image.



5.12 Additional accessories

5.12.1 Grease trap

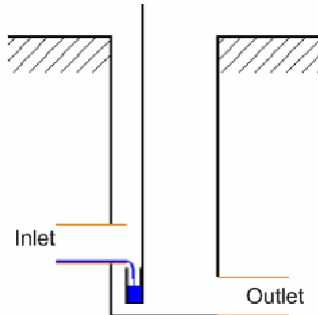
- Best practice indicates that a grease trap gets fitted before the Tricel Novo, particularly in applications where high quantities of grease/oil exist in the wastewater
- The grease trap must be monitored on a regular basis and emptied when required to ensure that it continues to operate correctly.

5.12.2 Sampling chamber

- Best practice indicates that a sampling chamber is fitted after every Tricel Novo 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.
- The inlet of the sampling chamber must be higher than the outlet to facilitate the sampling cup.

6 Plant operation

Once tank installation, plumbing and the electrical connection are complete, the Tricel Novo is now operational. The plant should be filled already with water during installation. If not, it should get filled before its first use. If



the plant is running correctly, you will hear a slight “hum” from the air blower, and there will be air bubbles coming up evenly from the bottom of the aeration chamber, rising to the surface.

Once the Tricel Novo plant is fully installed and operational, it is vital it gets commissioned by our service team or a Tricel Novo distributor to ensure it is working effectively. A commissioning certificate will then get issued to the customer.

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 system re-circulates the liquid in the plant ensuring continuous performance. In periods of overload the sludge return plant passes the fluid back into the primary chamber, so it passes through the aeration chamber again guaranteeing continuous performance. It may take up to 13 weeks for the biomass to become fully established and to reach optimum purification. All plants come fitted with an alarm, which will alert to irregularities in the plant.

6.1 Diffuser-manifold calibration (only applicable on plants IE18 and greater)

Plants come supplied with the manifolds valves in the fully open position as shown in the following image.



The valves on the manifold may require adjusting, during installation and subsequent services, to distribute the air evenly among the diffusers. Tricel approved personnel should make any adjustment.

Warning

Each valve must not be closed more than 50% as this will result in irreparable damage to the air-blower.

6.2 Timed sludge-return system (only applicable on plants IE18 and greater)

The timed sludge-return system is set to operate for 15 mins followed by a rest period of 1hr 45mins.



7 Disposal of treated water

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

8 Maintenance

Warning

Any maintenance carried out 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. Any person carrying out maintenance on the plant requires appropriate training. Suitable protection equipment including gloves, goggles, etc. should be worn 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, this is the responsibility of the homeowner.

8.1 Regular maintenance

- The vent around the base of the blower housing guarantees a fresh supply of air to the air blower. All vents should be checked to make sure they are not blocked or obscured.
- The vent under the desludging cover allows gas to escape and stops the tank from becoming pressurized.
- Ensure the air blower is working by listening for a gentle hum when standing beside the plant.
- The inlet and outlet should be inspected and rodded to remove any blockages if necessary.

8.2 Annual maintenance

- The Tricel Novo will require a full service (available from your supplier) every year to guarantee the efficiency of the plant gets maintained. Service personnel must get accommodated with unobstructed access to the tank.

8.3 Annual service (available from your supplier)

During routine servicing, the service technician will perform a series of checks and procedures:

Checks

- The air-diffuser is monitored to check for sufficient dispersion of air.
- The sludge return system is functioning correctly.
- The covers and locks are in place and good condition.
- General appearance and condition of the treatment plant are good.

Procedures

- Test the blower.
- Replace the blower filter.
- Test the plant alarm.
- Tests the pump and float-switch (If applicable).
- Clear the vents of any blockages.
- The sludge level in the primary chamber is measured.
- The diffuser manifold is adjusted if required (if applicable).

8.4 Production of sludge

Important

- The desludging of the Tricel Novo is the responsibility of the homeowner.
- There is the potential danger of falling into the tank during desludging when manholes may be open – take all necessary safety precautions when desludging.
- Do not allow machinery/traffic drive over the plant. Maintain a distance of at least four metres away from the covers on the Tricel Novo.
- The access cover should never be left off an unattended Tricel Novo.

When the sludge is occupying 50% of the volume of the primary chamber desludging is required, this is when the sludge is 700mm deep. For desludging periods, which depends on the occupancy of the dwelling, please refer to the table in section 3.1 'Dimensions.' Desludging gets done with a vacuum tanker (Tricel recommend the use of a licensed company).

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

- Remove the desludging access covers.
- Empty the Tricel Novo using the vacuum tanker. Ensure the solids get removed with the liquid.
- Care must be taken not to damage the Tricel Novo with the hose of the vacuum tanker.
- After emptying (de-sludging) the primary sludge chamber of any Tricel wastewater treatment tank, the primary chamber should be re-filled with water, until the water level flows into the aeration chamber (second chamber).
- Replace the desludging access cover securely.

9 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 Novo and is the responsibility of the customer.
- Only competent approved personnel should carry out desludging.
- Desludging must get carried out when required as specified, and the plant should be inspected regularly to check the depth of sludge in the primary chamber. If desludging is necessary, it should get carried out as soon as possible.
- An electrical connection to the plant must get maintained for it to function correctly. This connection ensures that the plant has a continuous air supply and where necessary the discharge pump will operate.
- The Tricel Novo is one part of the overall wastewater treatment system, which includes many components (plumbing, ventilation, plant and polishing filter. Each element has to function correctly for the whole system to work which is the responsibility of the homeowner.
- If the plant does not get installed correctly, 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 client. The manufacturer does not cover damage to the installation due to the influx of surface water or the backing up of soak ways or drains.
- To ensure the continuance of the Tricel Novo's performance the user has to take certain precautions including the following:
 - 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:
 - Watersoftener
 - 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 Novo:
 - 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 accommodated with unobstructed 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 higher load is placed on the plant by the addition of extra houses, bedrooms, schools, crèches, 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.
- Should the plant be used intermittently or if extended periods of non-use are to be expected, it is recommended that a plant remains on and in operation. The contents of the plant should not be allowed to turn septic due to non-use.
- The tank is not suitable for vehicular traffic. Tricel also recommends fencing off the area to prevent livestock herds from accessing the plant. Where possible, avoid unnecessary human traffic around the plant.
- The Tricel Novo is only suitable for human faeces. No animal faeces must enter the plant.

10 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 blower or pump stops working a buzzer will sound to indicate there is a problem with the plant. The buzzer can be muted until the problem gets fixed. Once fixed, the alarm will reset automatically and the mute switch must be turned off. All electrical work shall be carried out by a certified electrician.

10.1 Plant operation

Symptom	Possible causes	Solution
Blower/pump won't start or run	Fuse blown (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/pump.	A qualified person must check the blower/pump.
	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 sub surface 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.
Pump operates but delivers no water	Low line voltage or wired incorrectly.	An electrician should check the power supply to the plant.
	Something caught in impellers.	Clean out impellers or replace the pump. Ensure pump is disconnected from the mains before you attempt to unclog it.
	Delivery hose blocked.	Find blockage and remove or replace the damaged hose.
	Other.	A qualified person must check the pump.
Blowers runs intermittently	Thermal overload tripped.	Protect installation from the sun.
		Air supply vent blocked, clean if necessary.
		Filter blocked, replace if necessary.
		Discharge hose blocked or kinked, remove the obstruction.
	Electrical fault.	Get a qualified person to check that the alarm is installed correctly and the power supply to the plant is correct.
Diaphragm damaged/torn (if applicable).	Replace damaged diaphragm.	

Pump runs intermittently	Thermal overload tripped.	Check for clogged impeller (WARNING: Ensure the pump is plugged out before you attempt to unclog it.)
		The pump has run dry so add water.
	Float from the pump stuck.	Ensure the float on the pump is set correctly and can move freely.
	Damaged float.	A qualified person must check the pump.
The alarm is sounding, but the pump and blower are working	Air return pipe to the alarm not returning an air signal.	Check that the air pipe is not damaged or bent. Ensure there is air blowing through this pipe. Check that the pipe is inserted to the alarm correctly.
	Electrical fault.	Get a qualified person to check that the alarm is installed correctly.
	The electrical panel is wet.	Get a qualified person to check that the alarm is installed correctly.

Note:

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

10.2 Odours

Symptom	Possible causes	Solution
Effluent odour directly outside the house or inside the house	Pipe connections to toilets/drains not connected correctly.	Check that the traps/U-bends in the drains are fitted and the joints sealed.
	An air vent on pipework not fitted or fitted incorrectly.	Ensure all effluent pipes get vented correctly, vents are typically fitted to all pipes, and they should be higher than the eve of the roof.
	Pipework is damaged or blocked or fitted incorrectly.	Inspect pipework to ensure it is undamaged and clear of obstructions or sagging.
Bad effluent odour directly over the tank	Blocked pipework to or from the tank.	Check the level of liquid in the tank. Ensure the pipes are not blocked and are fitted correctly to the tank.
	Chemical kill of bacteria.	Ensure pumps are working correctly (If applicable). If the symptom persists for 48 hours or more, remove all liquid and replace with clean water.
	No air delivery - hydraulic/organic is overloading the tank vent.	Check blower is functioning properly
Note:	Smoke bombs/pellets, available from a plumber's merchants, can be used to trace the source the odour.	

11 Certification

The Tricel wastewater treatment plant has successfully passed the stringent European testing and approved to the new European standard EN 12566-3 Small wastewater treatment plants for up to 50 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 wastewater treatment plant 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 50PE and successfully passed all of the required tests.

11.1 Declaration of performance



- Declaration of Performance

DOP01CPRIRL03201414

1. Classification of Product:

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

2. Name of Product:

Tricel Novo IE6 – IE50

3. Product Characteristics

Material	Glass Reinforced Plastic (GRP)
Technology	Submerged Aerated Filter combined with Activated Sludge
Shape	Horizontal Cylinder with domed ends. 620mm x 620mm and Ø200mm Access openings as required.

4. Intended for Use:

To treat domestic wastewater for up to 50 population equivalent.

5. Name, Address and Contact Information of Manufacturer:

Tricel (Killarney).
Ballyspillane Ind. Est.
Killarney,
Co.Kerry.
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*	Harmonised Technical Specification
Nominal Organic Daily Load	0.36 kg/d	
Nominal Hydraulic Daily Load	0.90 m ³ /d	
COD	91.6% 52 mg/l	EN12566-3
BOD ₅	95.9% 11mg/l	
SS	95.3% 16 mg/l	
NH ₄ **	79.9% 8mg/l	
Electrical Power Consumption	1.1 kWh/d	

*Performance results obtained an average organic daily load of 0.26kg/d and a daily hydraulic load of 0.9m³/d

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

Material Performance

Essential Characteristic	Method	Performance	Harmonised 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 points two conforms with the declared performance in Point eight. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.



Michael Stack
Managing Director

27/03/2014



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

13

DOPO1CPRIRLO3201414

EN 12566-3

Packaged wastewater treatment plants for
treatment of domestic wastewater

- Product: Tricel Novo IE6 – IE50 Range of Wastewater Treatment Plants
- Material: GRP

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

Number.: NB 1739

Treatment capacity

- Nominal organic daily load: (BOD ₅)	As Set Out in Table CE for each Model
- Nominal Hydraulic daily flow (Q _N)	

Effectiveness of treatment:

Treatment efficiency ratios (at tested organic daily load BOD ₅ of 0,26 kg/d and daily hydraulic flow of 0.9m ³ /d)	COD: 91,6 % BOD ₅ : 95,9 % SS: 95,3 % NH ₄ -N: 79.9 %
-------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------

Water tightness: (Vacuum test)	
---------------------------------------	--

Crushing resistance: (Pit test)	Pass (also Wet conditions)
----------------------------------------	----------------------------

Durability	Pass
-------------------	------

Fire Resistance	Class E
------------------------	---------

12 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. (December 2017)

Notes

Notes

Notes

Tricel Identification Code	This Tricel is a	Nominal Organic Daily Load (BOD5) (Kg)	Nominal Hydraulic Daily Flow (Litres)
IE6		0.36	900
IE6+		0.36	900
IE8		0.48	1200
IE10		0.6	1500
IE12		0.72	1800
IE18		1.08	2700
IE24		1.44	3600
IE30		1.8	4500
IE36		2.16	5400
IE42		2.52	6300
IE50		3	7500



TRICEL
GENERATIONS OF INNOVATION

Tricel (Killarney), Ballyspillane Ind. Est., Killarney, Co. Kerry, Ireland.
Tel: +353 (0) 64 6632421 | **Email:** sales@ie.tricel.eu | www.ie.tricel.eu

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