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Synergy
WASTEWATER TREATMENT
P R O D U C T S

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TRICEL
ENVIRONMENTAL

Tricel® Novo EN6-50

Wastewater treatment plants

Engineering a green future



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It is important to read the full technical and installation guide prior to installation. This document should be retained for the lifetime of the product and in the event of change of ownership be transferred to the new owner.

Precaution

Prior to installation, please consider finished garden level when installing the plant. If you envisage that a manhole riser/extension may be required to ensure manhole lid remains above finished ground level, the plant must be installed with the appropriate excavation foundation and backfill to accommodate the riser. Please refer to page 16 for manhole riser details.

1. Health and safety precautions:

As safety and security are of vital importance, the following aspects are critical.

1.1 General:

- Ensure that all the information contained in this manual is adhered to at all times
- Treated wastewater is not suitable for human consumption.
- It's important that locks are 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.
- Naked flames shall not be used 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 cover of the plant when work is completed
- Sewage and sewage effluent can carry micro-organisms and gases harmful to human health. Any person carrying out work on the plant 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.

1.2 Electrical/Maintenance:

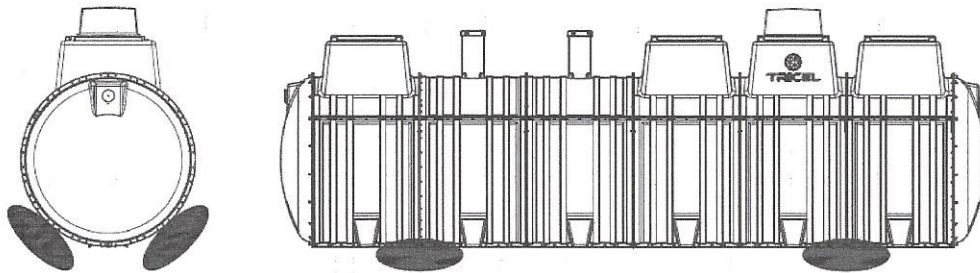
- All electrical work to be carried out by competent persons using suitable materials for the application.
- Do not open the Tricel® Novo cover without firstly isolating the mains power
- Electrical work must be carried out strictly to the manufacturer's instructions and to the relevant national rules for electrical installations.
- When working with machinery / electrical equipment, proximity of water shall be noted. Electrical equipment shall not be wet when working with it.
- There is potential danger when de-sludging and therefore this shall never be done alone.

1.3 Installation:

- Excavation work should be planned with due regard to health and safety requirements.
- Excavation should either be shored or battered back to a "safe" angle
- Use appropriate lifting equipment
- Care should be taken around grounds work machinery
- Keep proper footing and balance at all time

1. Transportation, unloading and storage of tanks:

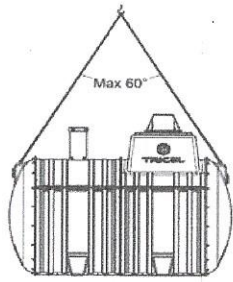
1. Tanks must be held down during transportation using nylon straps, do not use cables or chains to secure tanks. Do not over tighten straps to cause deformation of the tank shell. Do not drop or roll tanks from the truck.
2. Move tanks only by lifting and setting, do not drag or roll.
3. Always set the tank(s) on flat smooth ground free from debris etc. To prevent movement, tanks may need to be tied down and chocked.



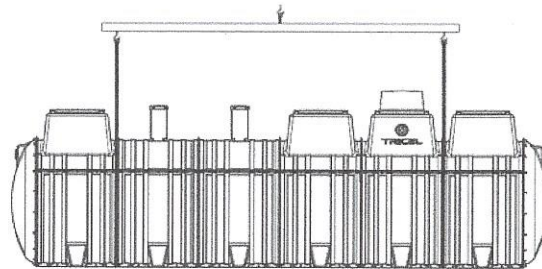
4. Tanks are best lifted by a machine and webbing lifting straps – do not use chains or wire ropes in contact with the tank. Ensure tank is empty when lifting. Care is needed to control the lift to ensure the tank is not damaged.
5. Tanks from one to four modules (4.6m) in length should be lifted using the eyebolts on the tank. 60° when lifting the tank. To ensure the angle is not greater than 60° the following sling lengths are required:

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

Ensure sufficient lifting height can be achieved and is available on site. If not a lifting bar as per option 2 is required.

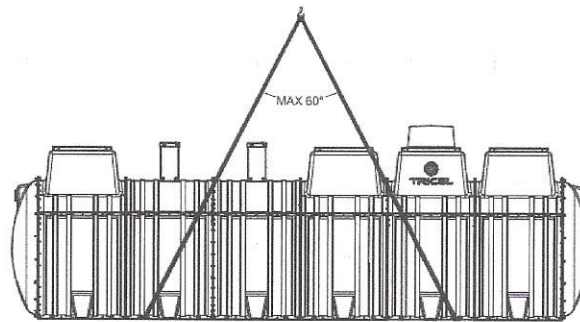
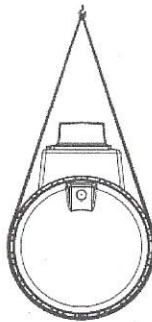


Option 1*



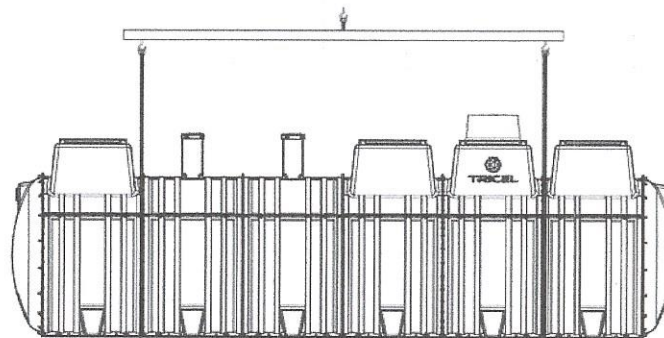
Option 2*

6. Tanks which are greater than 4 modules (4.6m) in length should be lifted using the slings provided as per option 3, shown below.



Option 3*

Ensure sufficient lifting height can be achieved and is available on site. If not a lifting bar as per option 4 is required.



Option 4*

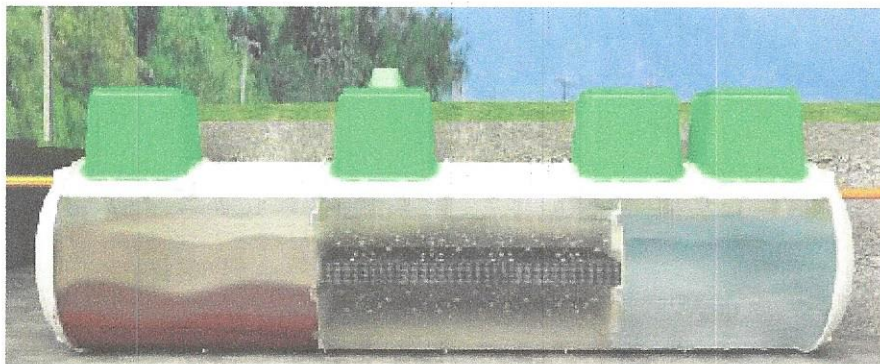
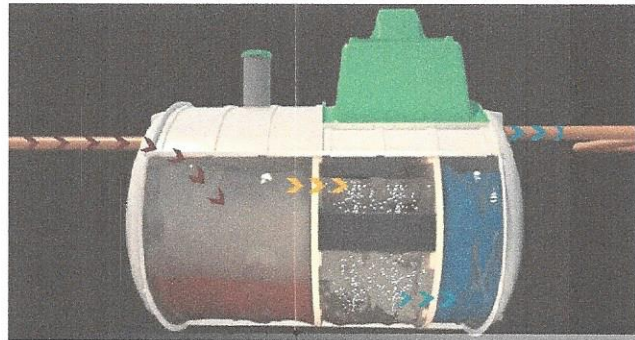
Ensure the slings are positioned at a joint on the tank, firmly secured and the load is evenly balanced.

*Typical lifting examples

1. Introduction:

Tricel Novo wastewater treatment plants are manufactured from Sheet Molding Compound (SMC) ensuring a durable and strong product. The Tricel Novo is manufactured in modular components and these modules are fabricated together to make different size tanks.

The Tricel Novo Submerged aeration plant is suitable for domestic and light commercial applications. These plants use a simple proven technology, comprising of 3 treatment zones. In each zone a different stage of the treatment occurs. Wastewater from the dwelling, toilets, sinks, shower etc., enters the plant and the purification process begins.



1. The wastewater purification process:

4.1 Stage 1: Primary settlement chamber:

The wastewater is introduced into the primary chamber. The large volume of this chamber reduces velocity of the wastewater. This along with the long flow path allow the wastewater maximum time in the first chamber resulting in a higher settlement rate. Settlement occurs when the heavier solids, drop out of the wastewater and settle to the bottom of the tank to create sludge and when lighter solids, like fats or oils, float to the top of the water to create a scum. Up to 70% of the solids are removed in Primary settlement zone. Anaerobic breakdown begins to occur and improve the water quality. A baffling system holds the sludge and scum in the primary settlement zone and allow wastewaters to move into the aeration zone. The large sludge storage volume increases the de-sludging intervals.

4.2 Stage 2: Aeration (treatment) chamber:

Stage 2 takes place in the aeration chamber where submerged aeration combines the principles of the bio film and activated sludge processes. Masses of naturally occurring bacteria inhabit specially designed plastic filter media. The filter media, has large surface area, and is supported within the aeration zone. As the liquid flows slowly through the filter media the bacteria feed on the waste removing them from the liquid. These bacteria are sustained with air, which is continuously supplied from a purpose built low pressure, high volume air compressor in the top section of the unit. The air is delivered through a diffused aeration system, which break the air into bubbles as they are dispersed through the aeration zone. The continuous circulation of the wastewater within the aeration zone means that the wastewater is passed through the filter media over and over, thus ensuring very high treatment efficiency. The purified liquid is then passed into the final settlement zone.

4.3 Stage 3: Final settlement chamber:

As the liquid flows from the aeration zone into the final settlement zone small quantities of bacteria may be carried with the liquid. Before discharge from the plant, these solids must be separated from the liquid. With the velocity of the liquid slowed down and the flow path maximised the bacteria settles to the bottom of the tank, like sludge, through the up flow nature of the zone. A sludge return system pumps this sludge back to the primary settlement zone. The remaining treated liquid now meets the required standard to be safely passed out of the Tricel Novo plant.

1. Plant Dimensions:

Tricel Novo wastewater treatment plants, certified to EN 12566-3:2005

Design population		UK6	UK8	UK10	UK12	UK18	UK24	UK30
Nominal inlet/outlet pipe diameter	mm	110	110	110	110	110	150	150
Overall length	m	2.1	2.6	3.1	3.6	4.6	5.6	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	2.27	2.27	2.27	2.27
Inlet invert to base	m	1.375	1.375	1.375	1.375	1.375	1.35	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	0.56	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	0.36	0.36	0.36	0.36
Weight empty**	kg	275	375	350	400	500	600	700
BOD Load	kg/day	0.36	0.48	0.6	0.72	1.08	1.44	1.8
Air blower rating (mean)	watts	60	100	100	100	200	200	200+60
Desludge period (minimum)***	months	12	12	12	12	9	8	6
Thickness (minimum)	mm	5	5	5	5	5	5	5
Retention time	hours	80	80	76.8	74	63.8	58.7	55.6

** Allow 100kgs for lifting purposes

*** Depending on use

Design population		UK36 *		UK42*		UK50*	
		Plant A	Plant B	Plant A	Plant B	Plant A	Plant B
Nominal inlet/outlet pipe diameter	mm	150	150	150	150	150	150
Overall length	m	2.6	5.6	3.6	5.6	3.6	6.6
Overall width	m	1.64	1.64	1.64	1.64	1.64	1.64
Overall height	m	1.99	2.27	1.99	2.27	1.99	2.27
Inlet invert to base	m	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
Inlet invert to ground level	m	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
Height above ground level	m	0.18	0.36	0.18	0.36	0.18	0.36
Weight empty**	kg	300	600	400	600	400	700
BOD load	kg/day	2.16		2.52		3	
Air blower rating (mean)	watts	200+80		200 x 2		200 x 2	
Desludge period (minimum)***	months	12		12		12	
Thickness (minimum)	mm	5		5		5	
Retention time	hours	56.5		54.6		51.1	

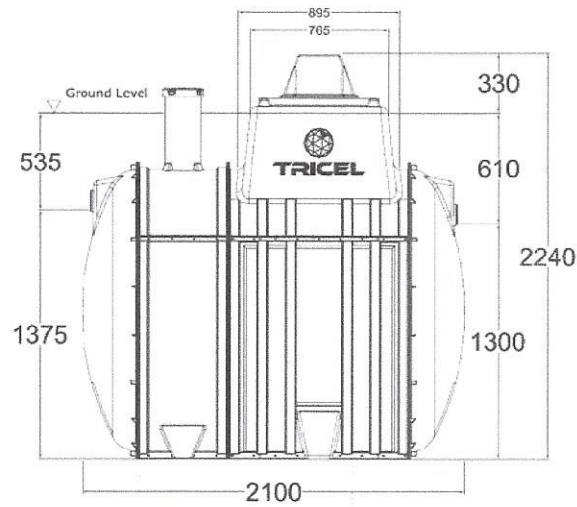
*Plants may require a stepped foundation, with "Tank B" lower than "Tank A" by 100mm approx.

** Allow 100kgs for lifting purposes

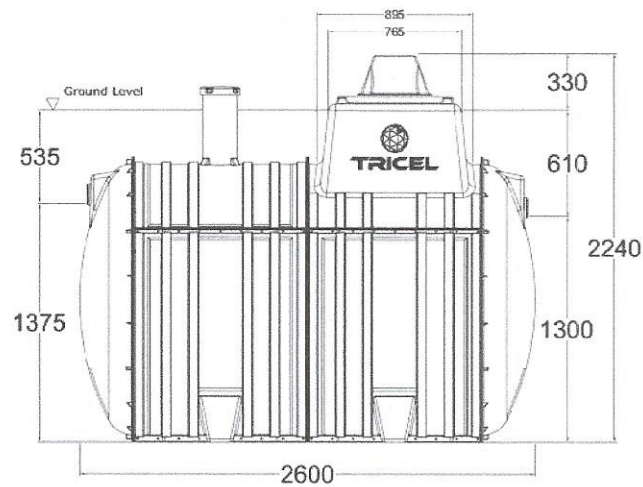
*** Depending on use

1. Plant Drawings:

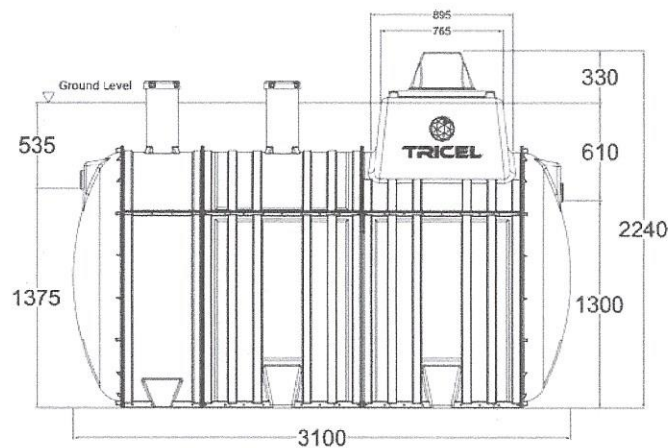
Tricel Novo UK6 gravity plant:



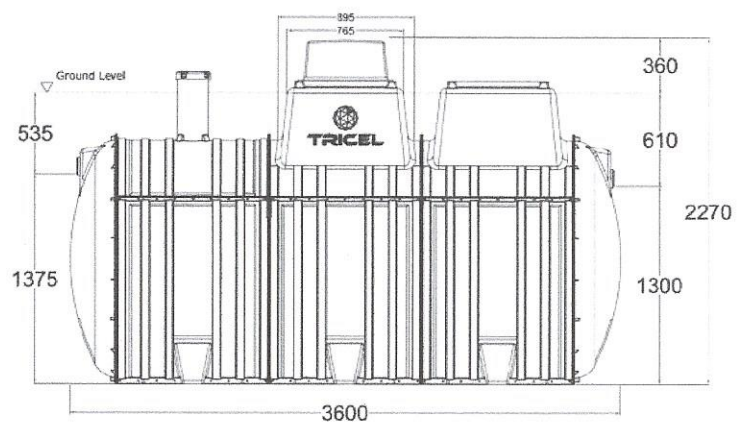
Tricel Novo UK8 gravity plant:



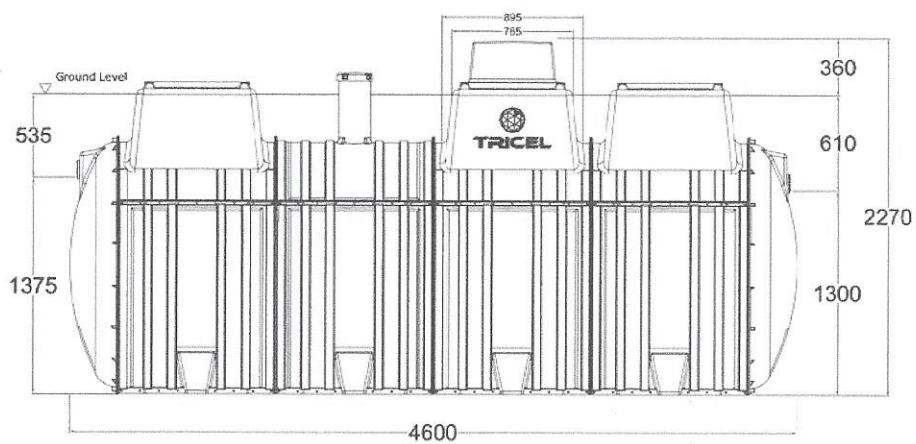
Tricel Novo UK10 gravity plant:



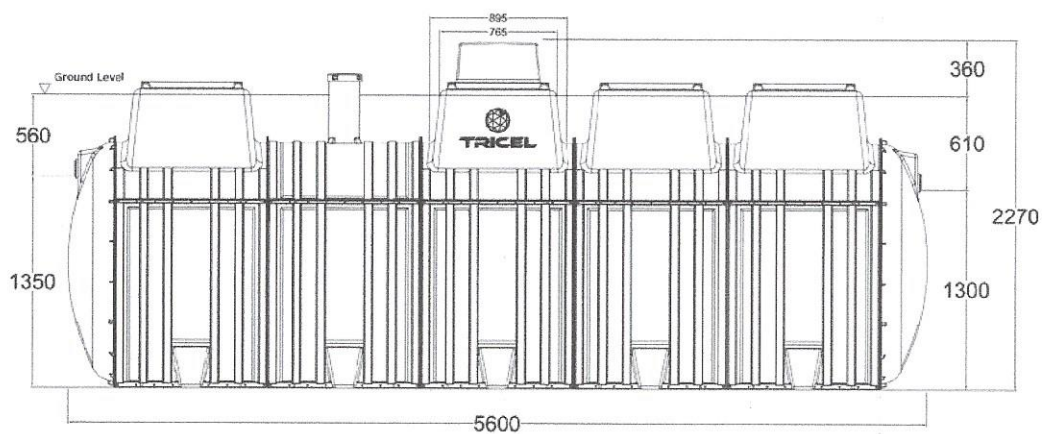
Tricel Novo UK12 gravity plant:



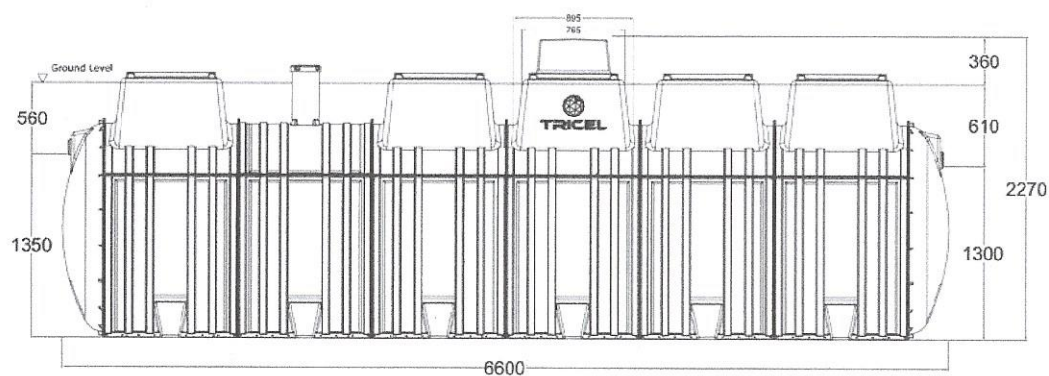
Tricel Novo UK18 gravity plant:



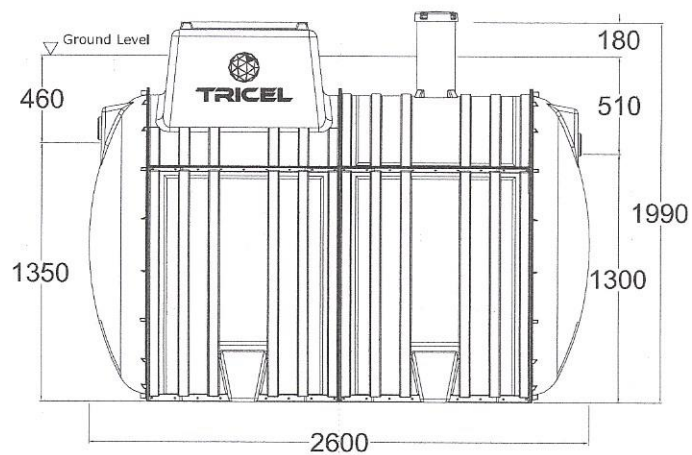
Tricel Novo UK24 gravity plant:

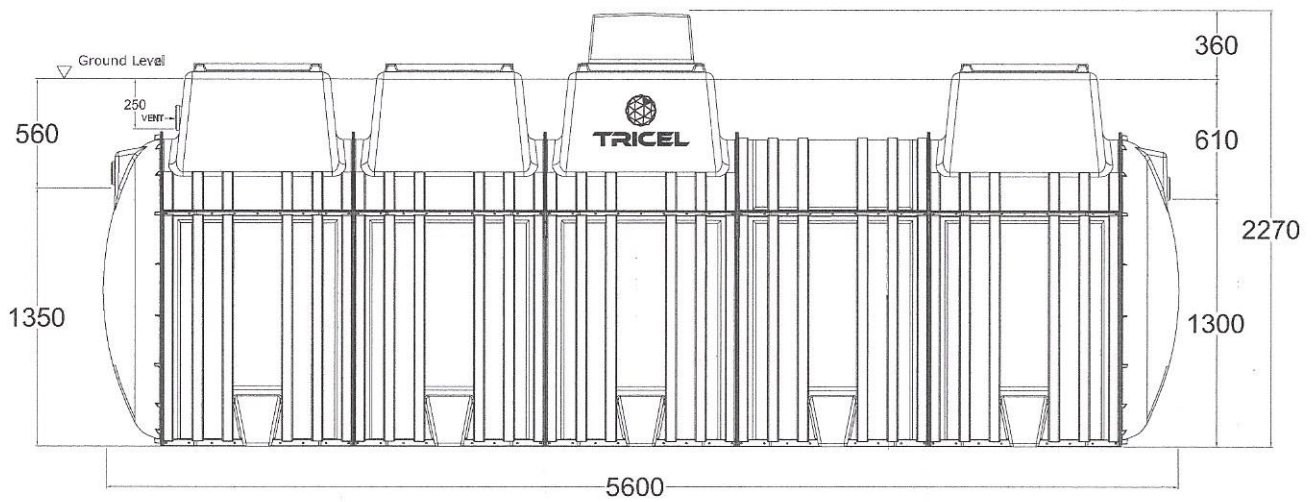


Tricel Novo UK30 gravity plant:

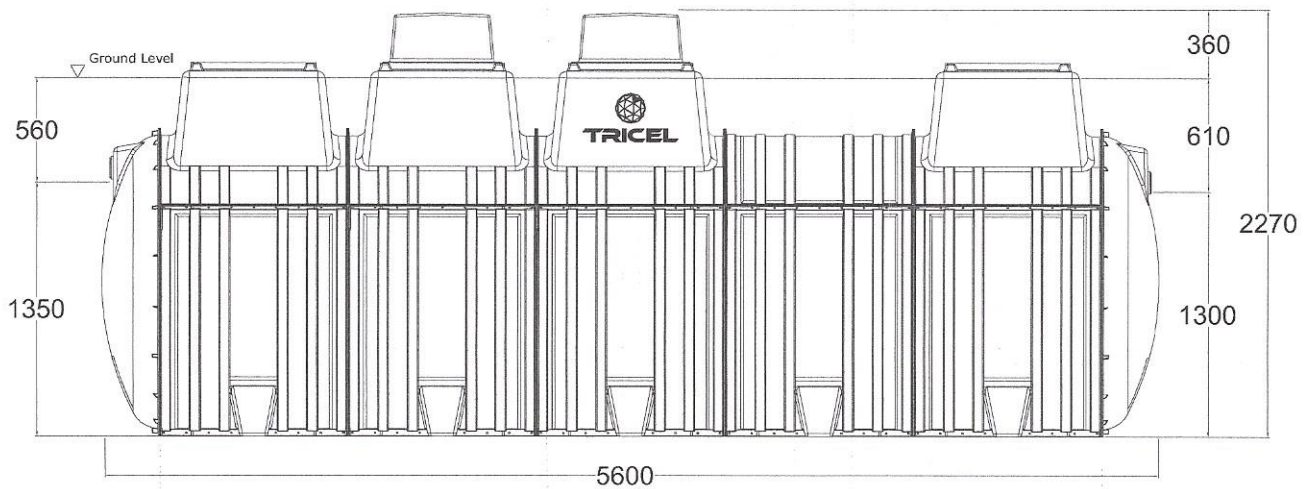
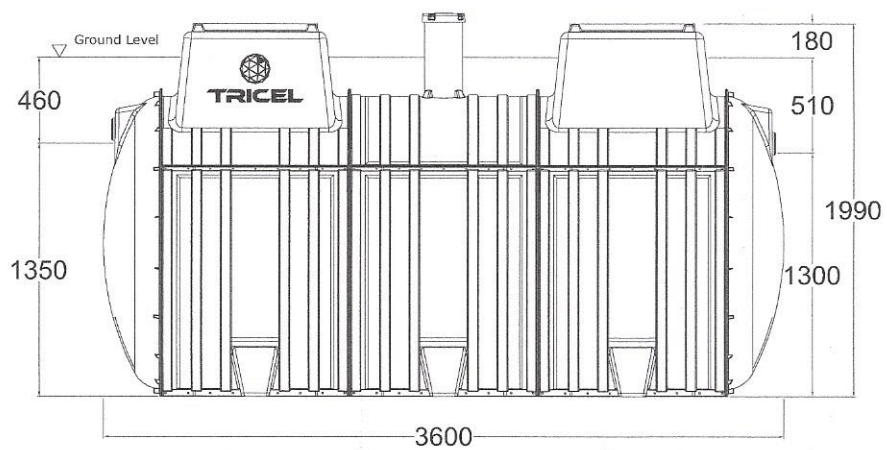


Tricel Novo UK36 gravity plant – 2 tank plant:

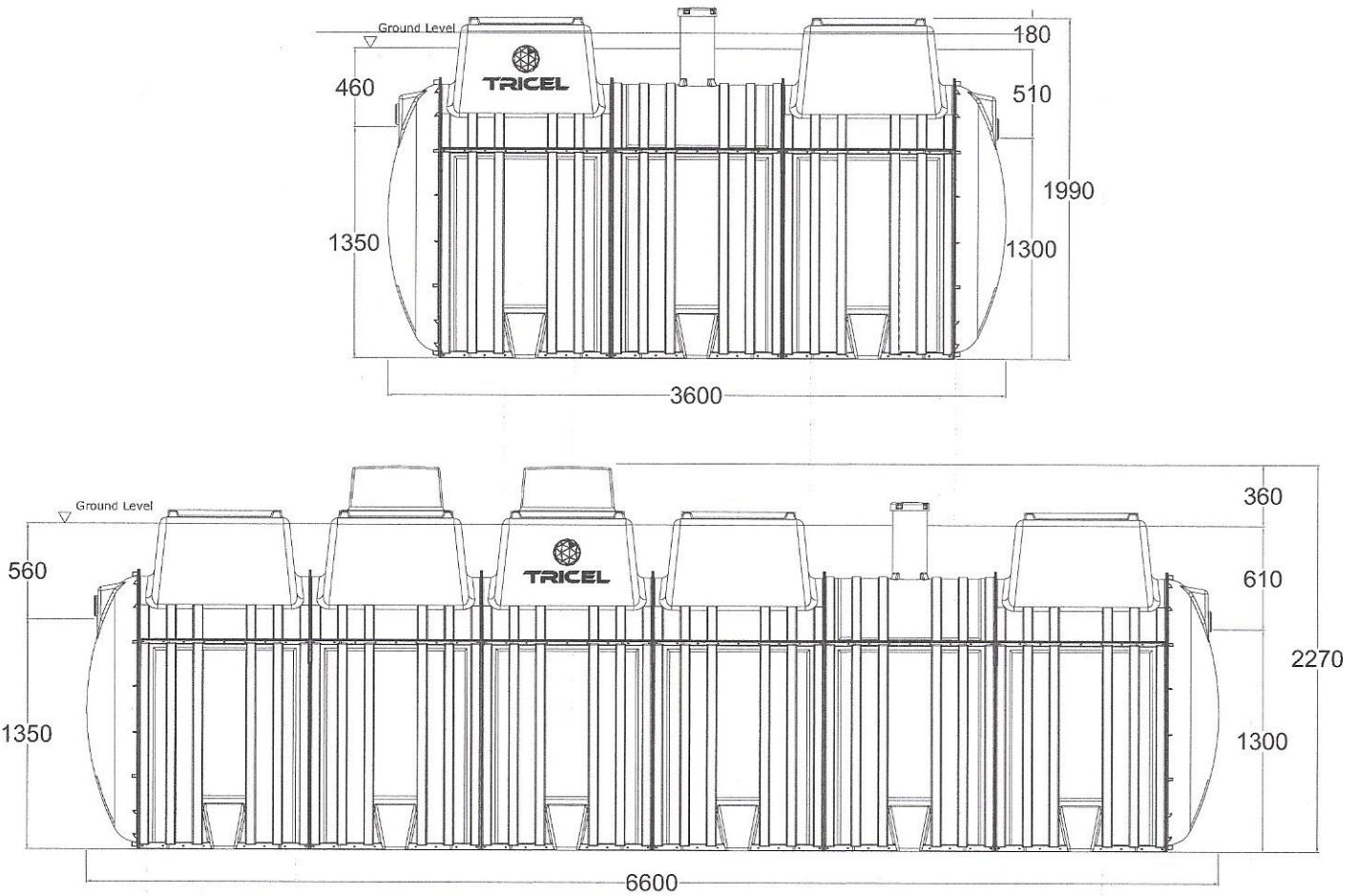




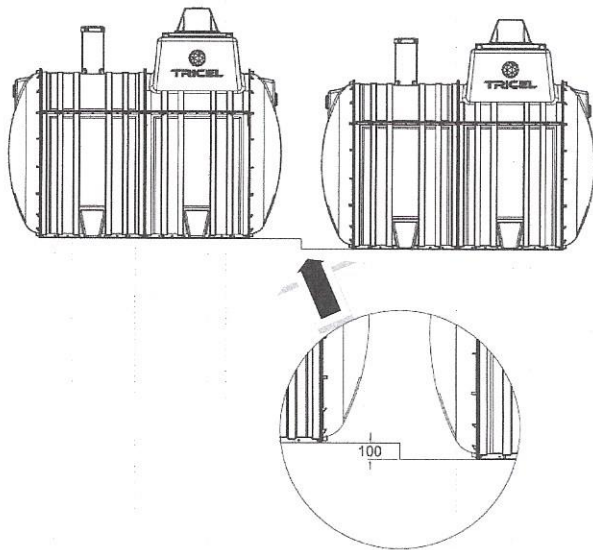
Tricel Novo UK42 gravity plant – 2 tank plant:



Tricel Novo UK50 gravity plant 2 tank plant:



Example of "stepped installation".

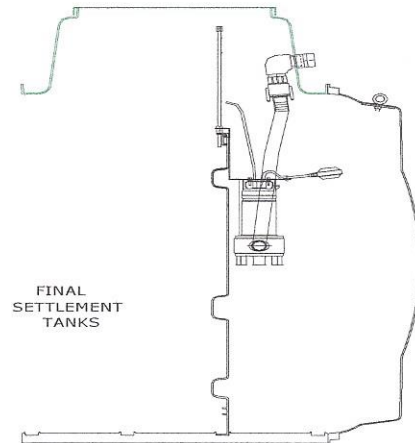


1. Technical drawing of Tricel pumped plant:

All plants are available as pumped options. The pump is housed in the final settlement chamber of each plant. Other pump options are available to customer specifications.

Pump Specification

- Min discharge rate 60L/min
- Continuous duty with 35°C liquids & fully submerged
- Dry motor (class F insulation)
- IP68 protection
- Max immersion 5m
- Single phase 220-240 V 50 Hz 2 poles
- 0.55 to 1.1 kW for single phase
- Rp 1 ½" delivery port (female gas)
- Handles solids up to 35mm



1. Lid locking points:

All manholes should be locked for safety. Tanks are supplied with 3 optional locking points, as seen above. All these points should be locked with a suitable locking device to prevent unauthorised access. Locking devices not supplied.



1. Manhole risers – (deep inverts):

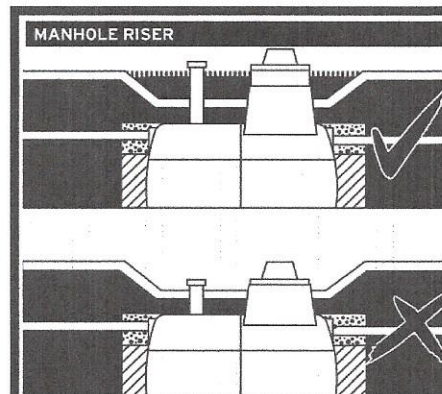
Manhole risers are available for deeper installation requirements

- **250mm** manhole risers require installation suitable for the site condition.
- **500mm* & 750mm*** manhole risers require a **complete concrete** installation – See section 10.5.
- Max manhole riser is 750mm

Never place the covers of the tank below ground level.

Do not allow ground water enter the plant

Only a Tricel Novo manhole risers should be used



Manhole risers are available

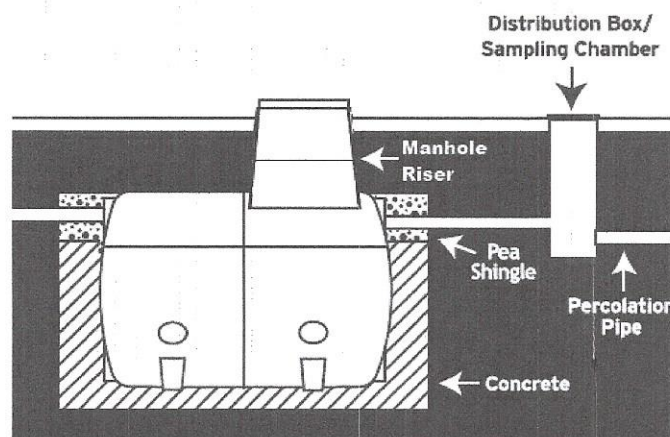
as standard

250mm

500mm

750mm

**Plants with a manhole riser of 500mm or 750mm must have a concrete installation. 500mm and 750mm risers cannot be retrofitted unless the correct installation is in place.*

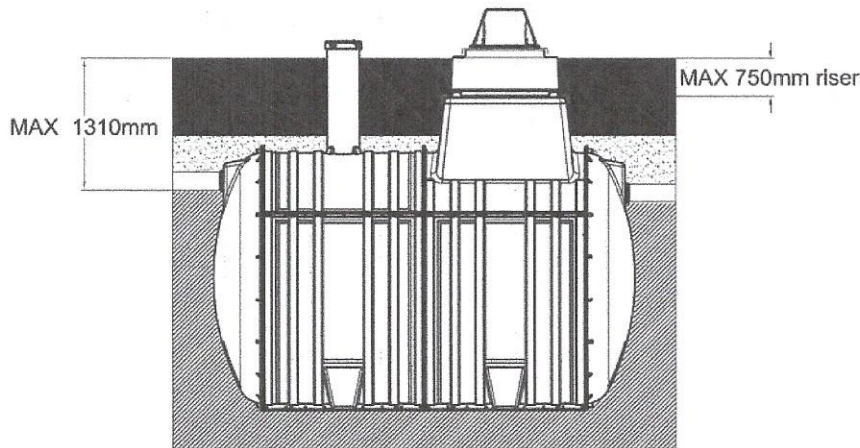


1. Installation:

All installations must be "fit for purpose" to suit the on-site conditions, which will vary from site to site.

This is the responsibility of the onsite contractor.

The Tricel Novo is suitable for a maximum manhole riser of 750mm which gives a maximum inlet invert of 1310mm, as per picture. The Tricel Novo is not suitable where a deeper installation is required.



10.1 Pre –installation tank inspection:

- Tanks should be visually inspected for fractures to shell or ribs, de laminations, scratches or abrasions deeper than 1.5mm prior to installation. Any damage should be notified to the delivery driver and/or to your supplier. Do not attempt to carry out any un-authorised repairs, as this will invalidate the warranty on the tank
- Once the tank has been installed, we cannot accept any claims for damage

10.2 Quick installation guidelines:

A **dry** site is one where the water table never rises higher than the base of the Tricel Novo plant.

A **wet** Site is one where the water table may rise higher than the base of the Tricel Novo plant.

The plant should never be installed where ground water can rise higher than the inlet pipe.

Important
<i>Inlet invert to finished ground level must be determined to ensure the correct installation procedure is followed. See section 9.</i>

Guidelines	Dry Site	Wet Site
The tank should be located as far away from the dwelling as is practically possible considering topography and pipe work levels. Separation distances must meet all National and Local regulations. The tank location should be specified by a suitably qualified person. The plant must be installed correctly to ensure surface or ground water does not enter the plant.	✓	✓
Never roll the tank. Tanks shall be lifted into position in accordance with supplier's instructions. <i>See section 2</i>	✓	✓
Dig a hole 500mm larger than the plant dimensions in plan. The depth of the hole will be determined by the inlet pipe level.	✓	✓
If the plant contains more than one tank a stepped installation is required	✓	✓
Remove any soft spots or boulders of significant size from the base or sides of the excavation.	✓	✓
Ground water must be pumped to give a dry excavation and excavation lined with polythene.		✓
Determine the type of backfill by taking into account, ground conditions (wet or dry) and finished ground level (determine if and type of risers required). The site engineer should specify the site conditions.	✓	✓
A base is then formed using compacted gravel and this must be flat and level.	✓	
A base is constructed of a 50mm layer of compacted gravel covered with a 250mm layer of 25n semi dry concrete.		✓
Ensure gravel/concrete is clean and contains no large materials.	✓	✓

Lift tank into position and align height for connecting pipe work.	✓	✓
Ensure correct inlet and outlet orientations of the plant, which may contain 1 or more tanks.	✓	✓
Ensure that each tank is 100% level.	✓	✓
Connect pipe work, as required.	✓	✓
Ballast the tank with water. <i>Refer to detailed installation</i>	✓	✓
Commence gravel backfilling in 300mm layers approximately up to 50mm over the cylindrical body of the tank, ensuring tank and any pipe work is properly supported.	✓	
Commence concrete backfilling in 300mm layers approximately up to the pipe work level, ensuring tank and any pipe work is properly supported.		✓
Continue backfilling with gravel up to 50mm over the cylindrical body of the tank		✓
Mount and seal any turret extensions.	✓	✓
Complete backfilling with topsoil up to the max ground level line indicated on the plant. The surrounding finished ground level should never be higher than the "max ground level line".	✓	✓
Compact evenly around the tanks to ensure it's properly supported.	✓	✓
An access chamber should be installed before and after the tank for sampling and to assist in clearing possible blockages	✓	✓
If sewage consists of high quantities of grease a grease trap should be installed prior to the plant.	✓	✓

Note: The option of a reinforced concrete slabs or deadman anchor may also be used on wet sites. This should be designed by an on-site structural engineer to suit site conditions.

10.3 Detailed installation information:

The Tricel Novo must be situated a minimum of 7m from the dwelling and as far away as practically possible considering topography and pipe work levels. The Tricel Novo should not be installed in an area subject to flooding or excessive water runoff. The area around the Tricel Novo should be adequately drained, to permanently remove ground water and surface water from the proximity of the tank. The Tricel Novo system is not suitable to be used in water logged sites, where the ground water may rise above the inlet level.

10.3.1 Excavation size:

Suitably sized equipment will be required to excavate the hole and to lift the plant into place.

Installation depends on on-site conditions, water, slopes, location etc. Excavation should be planned with due regard to health and safety requirements, and should be either shored or battered back to a "safe" angle. The excavation should allow a minimum 250mm clearance between the tank and the excavation wall or face of shoring. A minimum of 500mm is also required between adjacent tanks. Unstable ground with excessive sand, peat swamps etc. may require larger excavations. The excavation should be maintained dry by pumping or whatever suitable means.

Total excavation: {Width. + 500mm} x {Length + 500mm}

Excavation depth:

Dry Site: Allow 250mm for tank base/plinth.

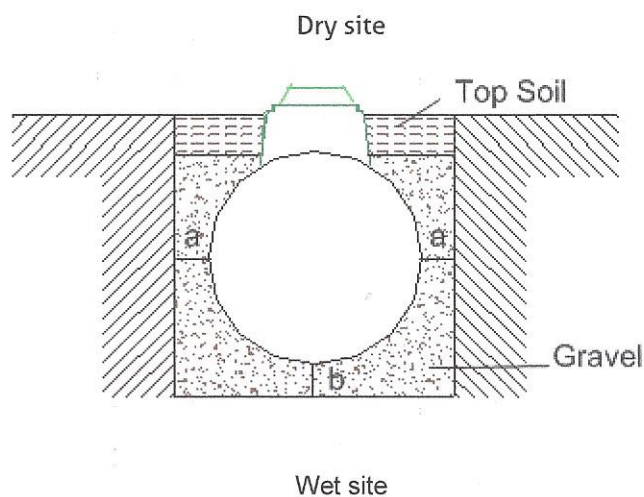
Wet Site: Allow 300mm for tank base/plinth

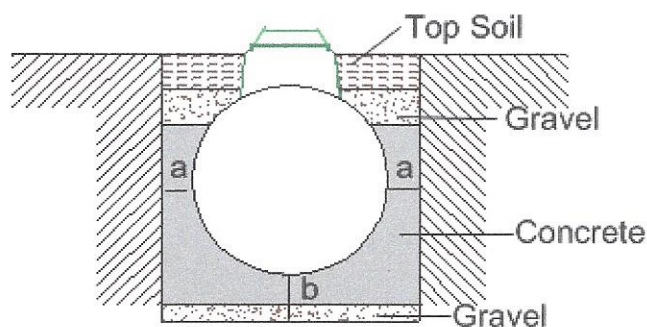
Tank Size	Excavation Size Tank A (m)	Excavation Size Tank B (m)
UK6	2.6 x 2.14	N/A
UK8	3.1 x 2.14	N/A
UK10	3.6 x 2.14	N/A
UK12	4.1 x 2.14	N/A
UK18	5.1 x 2.14	N/A
UK24	6.1 x 2.14	N/A
UK30	7.1 x 2.14	N/A
UK36	3.1 x 2.14	6.1 x 2.14
UK42	4.1 x 2.14	6.1 x 2.14
UK50	4.1 x 2.14	7.1 x 2.14

10.3.2 Excavation depth:

The excavation depth is determined by the inlet and outlet pipe, invert levels relative to the bottom of the tank, and allowing for the minimum base thickness shown. Dimension details of the tank are shown on the relevant drawing, supplied with the plant. Ground instability at formation level e.g. running sand may necessitate over-excavation and stabilisation with hard core or blinding concrete.

NOTE: Check that the depth to the base slab is within the Service Specification requirements for the tank.





	Tank Width. in mm	"a" minimum in mm	"b" minimum in mm
Dry Site	1650	250	250
Wet site	1650	250	300

10.3.3 Loadings:

If the tank is 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 load being transmitted to the tank (or its concrete surround). If this slab is constructed immediately above the tank, it should be separated from the concrete surrounding the tank by a compressible material. *Installation guidelines are available from www.uk.tricel.eu*

10.3.4 Control of groundwater:

During installation tanks must not be subjected to buoyant forces.

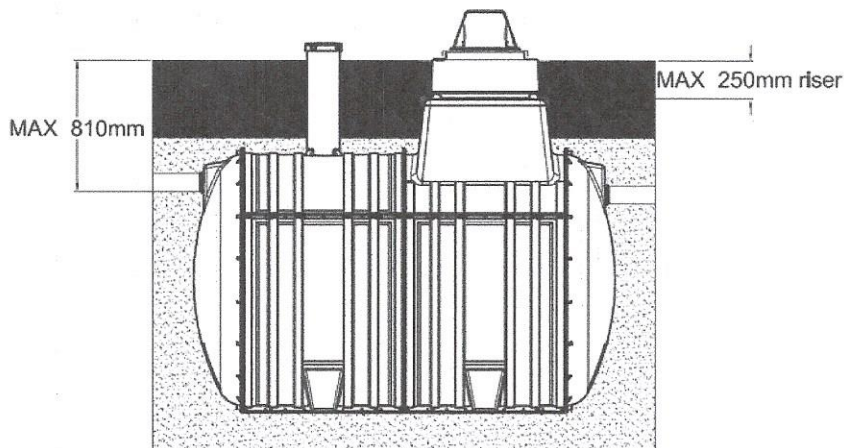
Incorrectly installed tanks that are subject to movement, rotation or floatation may become damaged, for which we cannot accept liability.

Contact a qualified engineer if there are difficulties on site due to adverse water logging.

10.4 Gravel installation:

A gravel surround can be used in dry site conditions if the inlet invert is less than 810mm (maximum 250mm riser).

A dry site is one where the water table never rises higher than the base of the Tricel Novo tank.



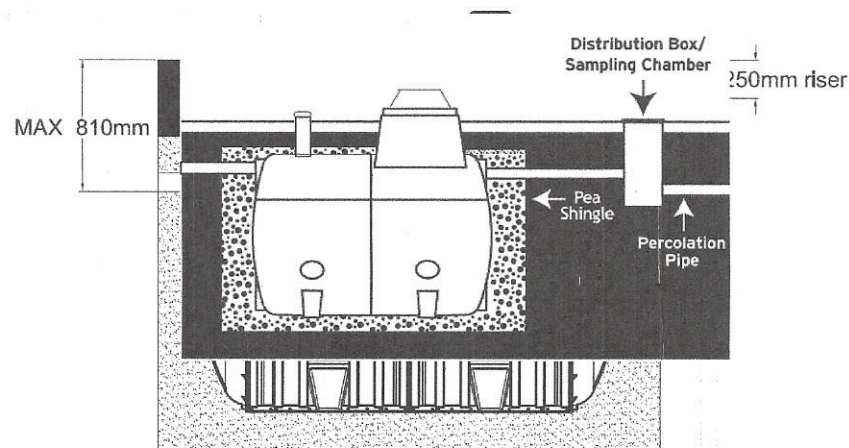
10.4.1 Tank base/plinth:

- Remove any soft spots or large stones and boulders
- The base is constructed of compacted gravel. *Refer to 10.5.1*
- Ensure that base is level and at the correct height to accommodate the incoming pipe work

10.4.2 Installing onto the base/plinth:

- Mechanically lift the plant carefully into the centre of the hole and place on the prepared plinth
- The plant must sit dead level on the plinth
- Connect and seal the pipe work to the plant.

10.4.3 Backfilling dry site:



Refer to backfill specification appropriate for site conditions

- Ballast*the plant by filling each chamber with clean water to a depth of 300mm and recheck the pipe work levels. Commence backfilling with gravel as per 10.5.1 in layers of 225mm evenly around the tank ensuring that there are no voids. Compact each layer ensuring the vibrating machine does not come in contact with the plant. Continue filling the chambers whilst backfilling, ensure that the progressive water level is no more than 300mm above the backfill level.
- Continue to backfill until gravel has reached 50mm over the cylindrical body of the tank.
- Mount and seal manhole risers (if used)
- Complete backfilling with topsoil up to the max ground level line.

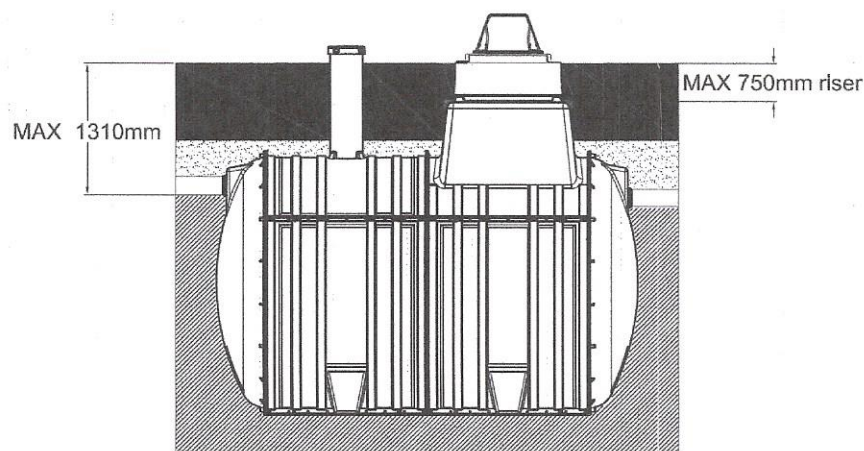
* Ballasting the plant is important to avoid the tank from lifting when backfilling.

10.5 Concrete installation:

A concrete surround must be installed in wet site conditions and sites where the inlet invert is between 810mm and 1310mm (plants with 500mm and 750mm risers).

A wet site is one where the water table may rise higher than the base of the Tricel Novo tank.

The option of a reinforced concrete slab or deadman anchor may also be used. This should be designed by an on-site structural engineer to suit site conditions.



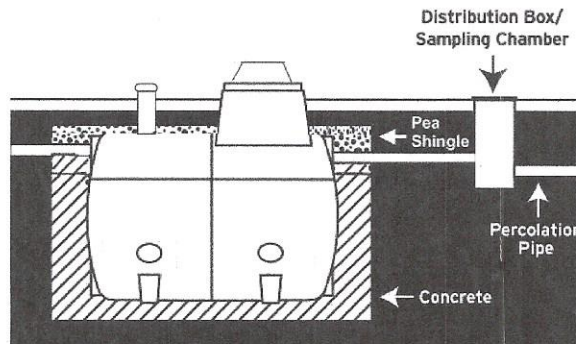
10.5.1 Tank base/plinth:

- Remove any soft spots or large stones and boulders.
- The base is constructed of a 50mm layer of suitably compacted gravel, covered with a 250mm layer of semi dry concrete. *Refer to 10.6.2*
- Ensure that base is level and at the correct height to accommodate the incoming pipe work.
- 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.

10.5.2 Installing onto the base/plinth:

- Mechanically lift the plant carefully into the centre of the hole before the concrete sets.
- The tank must be dead level on the plinth.
- Connect and seal the pipe work to the tank appropriately.

10.5.3 Backfilling a wet site:



Refer to backfill specification appropriate for site conditions

- Ballast* the plant by filling each chamber with clean water to a depth of 300mm and recheck the pipe work levels. Commence backfilling evenly around the tank ensuring that there are no voids. Continue filling the chambers whilst backfilling, ensure that the progressive water level is no more than 300mm above the backfill level.
- Backfill with concrete until it has reached the invert of the outlet pipe.
- Continue backfilling with gravel as per 10.6.1 until has reached 50mm over the cylindrical body of the tank.
- Mount and seal manhole extensions (if used)
- Complete backfilling with topsoil up to the max ground level line.

* Ballasting the plant is important to avoid the tank from lifting when backfilling.

10.6 Plinth and Backfill specifications:

10.6.1 Gravel backfill specification:

Primary backfill specification:

Primary backfill material should be free-flowing granular material. Compaction should be by lightweight rollers or vibratory plate compactor until "traffic" depth has been achieved. Compact gravel evenly to ensure tank is properly supported. Ensure the vibrating machine does not come in contact with the shell of the tank. Tanks must be 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 the tank.

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

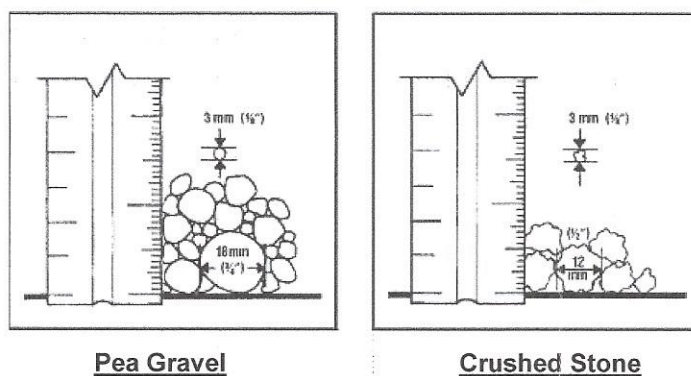
Crushed or processed stone:

Minimum particle size 3 mm, maximum 12 mm, compacted to a relative density of >40%

Dry Gravel density must be at least 1500 kg/m^3 . 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 2.36 mm sieve

Use of other than specified backfill and bedding materials will void the tank warranty.

Backfill material shall not be frozen or contain lumps of frozen material at any time during placement.



10.6.2 Concrete backfill specification

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

Note: Standard concrete mixes should not be used, where sulphates or similar 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 15 kN/m^2 on the tank is not exceeded.

Vibration:

The tank design assumes minimal compaction of the surrounding concrete. Where necessary, this may be extended to include light internal 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.

10.6.3 Top soil:

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

Note: The use of geo textile barrier fabrics surrounding the primary backfill material 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 primary backfill material.

1. Electrical installation:

Electrical installations must be carried out by a qualified and certified electrician. Please ensure the plant supplied complies with all local regulations and requirements. A wiring label is located on the inside of the alarm box.

Important

Please ensure the electrical installation complies with all national regulations and requirements

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

- A single run of 1.5mm² 3 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 properly bonded to the main earth at the premises.
- Never disconnect the power to the air pump. It is imperative that it is running 24 hours a day, every day.

1. Plumbing the plant:

The plumbing to and from the plant should be completed by a competent person in accordance with national regulations and best practices.

Important

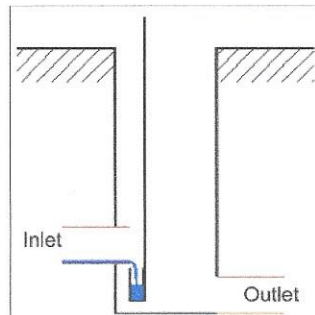
Do not: Plumb storm-water (water) from roofs, drains, footpaths etc., into the Tricel Novo Wastewater treatment plant

Grease Trap:

Best practice indicates that a grease trap be fitted before the plant particularly in applications where high quantities of grease exist in the wastewater.

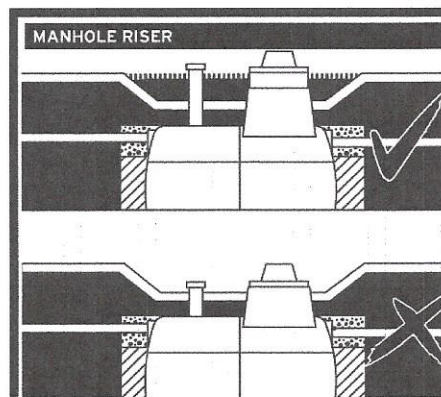
Sampling chamber:

Best practice indicates that a chamber be fitted after every unit to allow easy access for sampling purposes. The inlet of the chamber must be higher than the outlet to facilitate sampling cup.



1. Ancillary installation notes:

The finished ground level should never be higher than the level indicated on the plant. A riser should be fitted if required, see section 9.



13.1 Ventilation:

Ventilation is crucial to the plant and should be installed as per the building regulations.

13.2 Control housings:

Monitoring equipment, alarms, blowers or pumps if supplied, may be placed into separate control housing. These can be fitted with visual / audio / alarms along with other equipment. If so, a mains supply may be required. Mains must be disconnected before maintaining the plant. Consideration should be given to the location and security of the control housing.

13.3 Access:

Once the plant has been completely installed, we recommend that access is restricted to the area around the plant and/or control housings. Access for maintenance or de-sludging must be available.

1. Plant operation:

Once installation, plumbing and the electrical installation are completed, the Tricel Novo is now operational. The plant should already be filled with water during installation. If not, it should be filled before its first use. If the plant is running correctly, a slight "hum" will be heard from the air blower and there will be air bubbles coming up from the bottom of the middle chamber, rising to the surface.

The unit runs 24 hours a day 7 days a week all year round for optimum purification. In periods of low occupancy the sludge return re-circulates the liquid in the plant ensuring continuous performance. In periods of overload the sludge return plant passes the liquid back into the primary so it passes through the aeration chamber again ensuring continuous performance. It may take up to 13 weeks for the biomass to become fully established and to reach optimum purification.

All units are fitted with an alarm, which will alert of irregularities in the plant.

1. Disposal of treated water:

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

1. 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 must be appropriately trained. 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. Refer to Health and safety precautions in Section 1

A certain amount of plant maintenance is required, on an ongoing basis to ensure that the plant is working correctly. This is the responsibility of the homeowner.

16.1 Regular maintenance:

The vent around the base of the blower housing, guarantees a fresh supply of air to the air blower. The vent under the de-sludging cover allows gas to escape and stops the tank from becoming pressurised. All vents should be checked to make sure they are not blocked or obscured.

Ensure the air blower is working by listening for a gentle hum when standing beside the plant.

Inspect pipework for blockages if necessary.

16.2 Yearly maintenance:

The inlet and outlet should be inspected and rodded to remove any blockages if necessary.

The Tricel Novo plant will require a full service every year to guarantee the efficiency of the plant is maintained. Service personnel must be accommodated with clear access to the tank.

16.2.1 Yearly service:

During routine servicing the following items are checked if applicable

Sludge return

Functionality of blower and / or pump

Pump pressures

Pump filters are replaced

Pump Diaphragm checked

Alarm checked

Ventilation function tested

Diffuser monitored to check for dispersion of air

Tricel Covers and locks

Manifold adjusted

16.3 Production of sludge:

<i>Important</i>
<i>The de-sludging of the Tricel Novo plant is the responsibility of the homeowner</i>
De-sludging should never be carried out alone.
Do not allow equipment drive over the plant. Maintain a distance of at least 4 meters away from the covers on the Tricel Novo wastewater treatment plant.
The access cover should never be left off an unattended plant

When the sludge is occupying 50% of the volume of the primary chamber de-sludging is required. This is when the sludge is 700mm deep. Approximate de-sludging periods are shown in the table on page 8. The Tricel Novo plant has a separate de-sludging access. De-sludging is done with a vacuum tanker (we recommend the use of a licensed company).

16.3.1 De-sludging (emptying the solid waste from chamber 1 the primary chamber):

- Remove the de-sludging access cover(s)
- Empty the Tricel Novo plant using the vacuum tanker. Care must be taken not to damage the plant with the hose of the vacuum tanker
- Replace the de-sludging access cover securely

1. Operating conditions:

<i>Disclaimer</i>
<i>We 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.</i>

The manufacturer's installation, operation and maintenance instructions outlined in the technical manuals must be followed at all times to ensure the plant operates as designed. Any variations to these guidelines 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.

- De-sludging is a critical part of the successful operation of the Tricel Novo wastewater treatment plant and is the responsibility of the customer. Only competent approved personnel should carry out de-sludging. De-sludging must be carried out yearly, however the plant should be inspected regularly to check the depth of sludge in the primary chamber. If de-sludging is required it should be done as soon as possible.

- An electrical connection to the plant must be maintained for it to function correctly. This ensures that the plant has a continuous air supply and where necessary the discharge pump will operate.
- The Tricel Novo plant is one part of the overall wastewater treatment system, which includes many components (plumbing, ventilation, plant and polishing filter. Each component has to function correctly for the overall system to work which is the responsibility of the homeowner.
- If the plant is not installed correctly, flooding, overloading, electrical shock or floatation may occur. We are not responsible for incorrectly installed plants.
- Soak ways, drains and the emptying of primary chamber remains the responsibility of the client. Damage to the installation due to the influx of surface water or the backing up of soak ways or drains is not covered by the manufacturer.
- To ensure the continuance of the plant performance the user has to take certain precautions including the following:
 - The design loading of the plant should not be exceeded.
 - 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:
 - Water softener regenerate
 - 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 plant:
 - Large quantities of milk, alcohol or food
 - Large quantities of bleaches or cleaners
 - Baby wipes, cosmetic and cleaning wipes
 - Sanitary towels
 - Tampons
 - Kitchen paper
 - Nappies
 - Medication
- Service personnel must be accommodated with clear access to the plant.
- If others size the plant, we 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 we size the plant and a greater load is placed on the plant by the addition of extra houses, bedrooms, schools, crèche's etc. or by other means we are not responsible for the plant in terms of 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 expected, it is recommended that the plant remain on and in operation. The contents of the plant should not be allowed to go septic due to non-use.
- The tank is not suitable for vehicular traffic. We also recommend fencing off the area to prevent livestock herds from accessing the plant. Where possible, unnecessary human traffic around the plant should be avoided.

Terms & conditions

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

1. Troubleshooting:

Properly installed, operated and maintained plants will give many years of trouble free service. All plants are fitted with an alarm, which will alert of 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 is fixed. Once fixed, the alarm will reset automatically and the mute switch must be turned on. All electrical work shall be carried out by a qualified person.

Symptom	Possible causes	Corrective action
Blower/Pump won't start or run	Fuse blown (if applicable)	Replace with fuse of proper size
	Tripped breaker	Reset breaker
	Low line voltage and wet electrics	An electrician should check the power supply to the plant
	Defective blower/pump	Blower/pump must be checked by a qualified person
Blower operates but delivers no air	Low line voltage	An electrician should check the power supply to the plant
	Filter blocked	Replace filter
	Diaphragm broken	Replace diaphragm if applicable
	Defective blower malfunction	Air blower must be checked by a qualified person
Pump operates but delivers no water	Low line voltage	An electrician should check the power supply to the plant
	Something caught in impellers	Clean out impellers or replace pump. Ensure pump is disconnected from the mains before you attempt to unclog it.
	Delivery hose blocked	Find blockage and remove or replace damaged hose
	Other pump malfunction	Pump must be checked by a qualified person

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 obstruction
	Electrical fault	Get a qualified person to check that the alarm is installed correctly and the power supply to the plant is correct
Pump runs intermittently	Thermal overload tripped	Check for clogged impeller The pump has run dry so add water. Ensure the pump is plugged out before you attempt to unclog it.
	Float from the pump stuck	Ensure the float on the pump is set correct and can move freely.
	Damaged float	Pump must be checked by a qualified person
Plant fills above working water level	Subsurface disposal system clogged	Contact installer to repair sub surface disposal system/ Percolation area.
	Storm water flooding	Redirect storm water drains. Storm water must never enter the system
	Pump not working	Check pump is functioning properly as above
	Discharge hose/pipe blocked	Find blockage and remove or replace damaged hose/pipe
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.

Please 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 wastewater disposal plants vent gases back through soil pipe 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	Corrective action
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
	Air vent on pipe work not fitted or fitted incorrectly	Ensure all effluent pipes are vented correctly, vents are normally fitted to all pipes and they should be higher than the eave of the roof.
	Pipe work is damaged or blocked or fitted incorrectly	Inspect pipe work to ensure it is undamaged and clear of obstructions or sagging.
Bad effluent odour directly over the tank	Pipe work to or from the tank is blocked	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 properly if applicable. If symptom persists for 48 hours or more, remove all liquid and replace with clean water
	No air delivery	Check blower is functioning properly
	Hydraulic/Organic overloading	Reduce flow and/or organic load
	Tank vent blocked	Clear tank vents

In accordance with our normal policy of product development, this specification is subject to change without notice. March 2014



- Declaration of Performance

DOP01CPRUK03201414

1. Classification of Product:

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 Novo UK6 – UK50

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 (Gloucester).
Fox House,
Stonedale Road,
Stonehouse,
Gloucester,
GL10 3SA,
United Kingdom.
Tel: ++44 (0) 1453 791616
Web: www.uk.tricel.eu

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

System 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	EN12566-3
Nominal Hydraulic Daily Load	0.90 m ³ /d	
COD	91.6% 52 mg/l	
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 at average organic daily load of 0.26kg/d and hydraulic daily 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 2 is in conformity with the declared performance in Point 8. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

Con Stack
Director

Date.....



Tricel (Gloucester).
Fox House,
Stonedale Road,
Stonehouse,
Gloucester,
GL10 3SA,
United Kingdom

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DOP01CPRUK03201414

EN 12566-3

Packaged wastewater treatment plants
for treatment of domestic wastewater

- Product: Tricel Novo UK6 – UK50 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: (BOD₅)
- Nominal Hydraulic daily flow (Q_N)

As Set Out in
Table CE
for each Model

Effectiveness of treatment:

Treatment efficiency ratios (at tested organic daily load
BOD₅ of 0,26 kg/d and daily hydraulic flow of 0.9m³/d)

COD: 91,6 %
BOD₅: 95,9 %
SS: 95,3 %
NH₄-N: 56,7 %

Water tightness: (Vacuum test)

Pass

Crushing resistance: (Pit test)

Pass (also Wet
conditions)

Durability

Pass

Fire Resistance

Class E