Kiel Industries
INNOVATORS IN PLASTIC PRODUCTS
A DIVISION OF PFG GROUP

03 December 2018

TO WHOM IT MAY CONCERN

RE: ROTA-LOO COMPOSTING TOILET INSTALLATION

This document is to support the application to a relevant Tasmanian local authority for the installation of a Rota-Loo Waterless Composting Toilet (WCT)system.

The Tasmanian Department of Justice has approved the Rota-Loo for installation and use as a Waterless Composting Toilet. The Certificate No is DOC/18/4605

Rota-Loo has been certified as compliant to AS/NZS1546.2:2008 On-site domestic wastewater treatment units - Waterless Composting Toilets

IAPMO R&T OCEANA™ OceanaMark

JASANZ Certifying Organisation:	IAPMO R&T Oceana
Product Compliance Certificate:	OMK30059

A copy of the certificate is attached below.

The system has no effluent output and all end product waste may be disposed of within the premises following a period of composting during which the waste is held within the system. End product waste has been tested by an independent NATA approved laboratory and found to comply with the requirements of the standard.

Sufficient information has been given to the applicant to ensure the required site drawings are able to be submitted with the application. All Installation and Operation Manuals, as well as Risk Management Plan can be downloaded from www.rotaloo.com.au

Kind regards,

Sonya Sing Lee

IAPMO R&T OCEANA

1040 Dandenong Road, Carnegie VIC 3163 AUSTRALIA

IAPMO R&T Oceana is a product certification body which inspects and arranges for the independent laboratory testing of samples taken from the manufacturer's stock or from the market or a combination of both, to verify compliance of the requirements of applicable Standards and Specifications. This activity is coupled with periodic surveillance of the certified product taken from the market place or the manufacturer's factory. This certification is subject to the conditions set forth in the characteristics below and is not to be construed as any recommendation, assurance or guarantee by IAPMO R&T Oceana of the product acceptance by Authorities Having Jurisdiction. The IAPMO R&T Oceana "OceanaMark" Product Certification Scheme is a JAS-ANZ accredited ISO Guide 67 Type 5 Product Certification Scheme.

OCEANAMARK CERTIFICATE

IAPMO R&T Oceana hereby grants to:

PFG Group Victoria Pty Ltd T/A Kiel Industries

A.B.N.: 32 628 714 652

87-93 Tramway Road, Morwell, Victoria, Australia, 3840

the right to use the OceanaMark in accordance with IAPMO Oceana Pty Ltd 'Mark Rules' on the product as described in the attached OceanaMark Schedule. The Certificate is granted subject to IAPMO Oceana Pty Ltd 'Governance Rules'.

Evaluated to:

AS/NZS 1546.2 On-site domestic wastewater treatment units - Waterless composting toilets

Manufacturer:

PFG Group Victoria Pty Ltd T/A Kiel Industries

Certificate No.:	OMK30059	Certified Date:	19 June 2017
Issue Date:	20 November 2018	Expiry Date:	18 June 2022

Chief Executive Officer of the IAPMO Group

This OceanaMark certification is for the period indicated herein and is void after the date shown above. Any change in material, manufacturing process, marking or design without having first obtained the approval of IAPMO R&T Oceana, or any evidence of non-compliance with applicable Standards, Specifications or of inferior workmanship, may be deemed sufficient cause for revocation of this certification. Reproduction of or reference to this certificate for advertising purposes may be made only by specific written permission of IAPMO R&T Oceana. Any alteration of this certificate could be grounds for revocation of this certification.

OCEANAMARK SCHEDULE

Certificate Holder:	PFG Group Victoria Pty Ltd T/A Kiel Industries	**Certificate No.:**	OMK30059
Address :	87-93 Tramway Road	**Issue Date:**	20-Nov-18
	MORWELL VIC 3840	**Expiry Date:**	18-Jun-22
	AUSTRALIA	**First Certified:**	19-Jun-17
A.B.N.:	32 628 714 652	**Standards:**	AS/NZS 1546.2:2008
			On-site domestic waste water treatment units
Manufacturer:	PFG Group Victoria Pty Ltd T/A Kiel Industries	Part 2:	Waterless Composting Toilets

Std/Spec: AS/NZS 1546.2:2008 *Certificate No.: OMK30059*

Brand Name	Model Name	Model ID	Product Type	Product Description	Application	Capacity
Rota-Loo	Rota-Loo 650	RL650	Waterless Composting Toilet	Self contained WCT unit for safe treatment and handling of human waste	Home / Holiday Home	4 equivalent full time people
Rota-Loo	Rota-Loo 950	RL950	Waterless Composting Toilet	Self contained WCT unit for safe treatment and handling of human waste	Home / low use public facility	8 equivalent full time people
Rota-Loo	Rota-Loo 2000 Maxi	RL2000	Waterless Composting Toilet	Self contained WCT unit for safe treatment and handling of human waste	Public use facility	20 equivalent full time people

END RECORD

Chief Executive Officer of the IAPMO Group

Tasmania

Certificate of Accreditation

On-Site Waste Water Management System

This Certificate of Accreditation is hereby issued by the Minister for Building and Construction pursuant to Section 18 of the Building Act 2016 and the Plumbing Code of Australia as applicable.

System:	Rota-Loo RL650 & Rota-Loo RL950 Waterless Composting Toilet System
Manufacturer:	Kiel Industries PTY LTD
Supplier:	Kiel Industries, 87-93 Tramway Road Morwell, Victoria 3840, ACN 006 655 616

This is to certify that the **Kiel Industries and the RL650 & RL950 Waterless Composting Toilet System,** (the **'system')** described in Schedule 1, is accredited as an on-site waste water management system for use in a single dwelling in Tasmania. This accreditation is subject to the conditions of accreditation and permitted uses specified in Schedule 2, and in accordance with the Building Act 2016.

Dale Webster
Director of Building Control
Delegate of the Minister for Construction

Date of Issue: 18 January 2018 **Certificate No: DOC/18/4605**

This Certificate of Accreditation is in force until 18 January 2023

Schedule 1: Specification Informative

Kiel Industries waterless composting toilet system models: RL650 & RL950

General Description

The Rota-Loo composting toilet systems are designed to receive and treat human waste from one or two toilet pedestals and reduce such wastes after a composting period into an innocuous relatively dry waste that is capable of being disposed of within the premises without nuisance or risk to health.

Specification

The Rota-Loo composting toilet system comprises a circular outer tank, inside which is a turntable divided into six (6) equal sections, each section holding a removable composting bin. The Rota-Loo is situated below floor level and directly under the toilet pedestal to which it is connected by a waste chute.

Access to the bins is provided by a hatch type door fitted on one vertical side of the outer tank. The outer tank, turntable, waste chute and bins are manufactured of medium density polyethylene.

Each bin has holes in the base and side to permit drainage of liquid and movement of air through the waste pile to maintain an environment for aerobic composting activity. The bins are supplied with a

Geotextile filter pad to ensure effluent solids are contained in the bin.

An air venting system is attached to the Rota-Loo to draw warm fresh air through the outer tank and out through an above-roof level vent. A low powered fan (DC or AC), located in the vent pipe, draws air through the outer tank to ensure adequate air flow to evaporate liquids, provide oxygen to the composting material and create a negative air pressure to prevent any odour rising into the toilet room.

The vent system is manufactured from readily available DWV PVC pipe and fittings.

The composting capacity and usage of the Rota-Loo models are expressed in the following table.

Model	Outer Tank Dimensions (mm)	Composting Bins	Equivalent full time adult residential use	Estimated Composting Time
RL650	dia 1200 x 650 high	6 x 30L	4	324 days
RL950	dia 1200 x 950 high	6 X 65L	8	351 days

Composting Time is calculated on the following basis

- Daily avg Faecal mass per person: 100g @50% moisture (The Humanure Handbook)
- Density of Faecal matter: 1.25 g/cm$_3$
- Composting Time: 90% volume of all bins/density/mass/#persons

(NB RL2000 effectively down-rated due to use of 2 pedestals reducing effective volume of bins to 65%)

From Figure E1 of AS1546.2:2008 App E, full composting is expected in less than 225 days even in the coldest climates, so the Rota-Loo design builds in more than 40% more composting time than required.

In installations where high liquid loads occur (typically public use facilities) or in cold climates the air flow through the Rota-Loo outer tank may not be enough to evaporate all the separated liquid. For these cases, provision is made to drain excess liquids into an absorption trench or a secondary liquid evaporation system which can be placed to effectively utilise solar heat transfer.

Method of Operation

The waste chute from the toilet pedestal above is located directly over a collection bin and waste from the toilet pedestal drops directly into a composting bin.

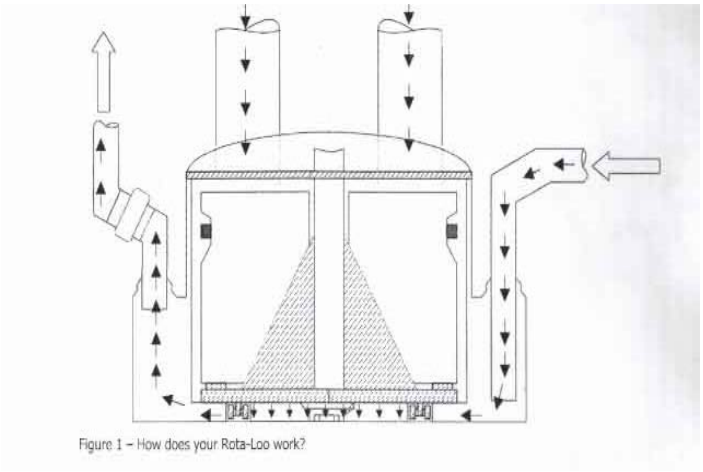

Figure 1 – How does your Rota-Loo work?

Liquid is drained through a filter pad in the bin into the base of the containment tank, from where it is evaporated with the aid of the forced ventilation system.

When the first bin has been filled, the outer hatch door is opened and the turntable rotated by hand one position. Once a bin is filled and rotated, no fresh waste can be added and the contents will compost safely and efficiently shut away inside the outer tank. The second bin is filled and rotated and so on until all bins have been filled.

The Rota-Loo design allows for a composting time of approximately 11-12 months at the designed usage capacity. The compost bins are numbered for easy recording and a direction arrow indicates the direction of rotation.

When the first bin has rotated through the Rota-Loo, it is then removed and the contents is disposed of by burying in a suitable location within the premises.

No effluent leaves the Rota-Loo. Liquids are evaporated and solids decompose within the Rota-Loo and are removed as composted humus, which are to be buried within the premises - the Operations Manual instructs the final contents to be buried with 300mm cover away from food cultivation areas.

 For more information of the operations and theory behind WCT's as presented to Rota-Loo customers, see the Rota-Loo Operations Manual.

 Rota-Loo has been Certified to comply with AS/NZS1546.2:2008 and holds the Oceana Mark

Certificate OMK30059.

 Test Reports of the end product as tested by a NATA laboratory to the Standard are available showing Rota-Loo end product exceeds the Standard requirements.

Schedule 2 – Conditions of Accreditation

Normative

1. Definitions

Where included in this Certificate of Accreditation and Schedules:

AS/NZS 1547 means the Joint Australian/New Zealand Standard '*AS/NZS 1547:2012 On-site domestic-wastewater management*';

AS/NZS 1546.2 means the Joint Australian/New Zealand Standard 'AS/NZS 1546.2:2008 On-site domestic wastewater treatment units, Part 2: Waterless Composting Toilets';

AS/NZS 3000 means the Joint Australian/New Zealand Standard '*AS/NZS 3000:2000 Wiring rules';*

AS/NZS 5667 means the Joint Australian/New Zealand Standard 'AS/NZS 5667.1:1998 Water quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and preservation and handling of samples';

BOD_5 means '5-day Biochemical Oxygen Demand';

Council means 'the Municipal Council having jurisdiction';

Commissioned means 'when the test results from a NATA Certified Laboratory show that the water quality requirements for the *system* have been met and all pre-commissioning tests have been carried out in accordance with AS/NZS 1547 on all associated equipment including the land application system';

Designer means 'a person who is accredited under the *Building Act 2016* or a *Plumber* who has a specialty in the area of designing on-site waste water management system installations;

Director means 'the Director of Building Control';

EC means electrical conductivity;

E. coli means 'Escherichia coli of the family Enterobacteriaceae which is a bacterium used in public health as an indicator of faecal pollution';

g/m^3 means grams per cubic metre, which is equivalent to milligrams per litre (mg/L); **Informative** defines the application of Schedule 1, which is for information and guidance only; **Manufacturer** means '**Kiel Industries'**;

NATA means 'National Association of Testing Authorities';

Normative defines the application of Schedule 2, which is an integral part of the Certificate of Accreditation;

PCA means 'Vol. 3 of the National Construction Code (Plumbing Code of Australia)';

Permit means 'a Permit issued by the *council* pursuant to Part 12 of the *Building Act 2016'*;

Permit authority means 'a person or body authorised for that purpose by the *council* of the municipal area in which the on-site waste water management system is installed';

Plumber means a person who holds an appropriate class of licence under the *Occupational Licensing Act 2005* as a Plumber Practitioner (Certifier);

Supplier means 'the party that is responsible for ensuring that products meet and, if applicable, continue to meet, the requirements on which the certification is based.' The supplier for the Rota-Loo RL650 & RL950 is **Kiel Industries Pty Ltd;**

System means Rota Loo RL650 or RL950;

TSS means 'Total Suspended Solids'.

2. General

2.1 For each installation the owner/occupier of the premises must make an application for a *permit* to a *permit authority* to install a *system* as a waste water management system in accordance with Part 12 of the *Building Act 2016*.

2.2 For each installation the application to the *permit authority* must include:

a) Plans and specification of the nominated *system*;

b) Where applicable, a site plan drawn to scale showing the location and type of any proposed waste water management system for the premises and state the method of managing greywater generated on-site;

c) A statement detailing the proposed method of disposal of the composted end product, the frequency of such disposal and the estimated volume of composted end product to be removed.

d) A statement about whether the *system* is likely to produce a liquid component and how it is proposed to dispose of the liquid. The statement shall be supported by detailed plans of any necessary liquid disposal system.

e) A copy of the Certificate of Accreditation which includes details of the *supplier*.

2.3 When issuing a *permit* the *permit authority* is to satisfy itself that, the designer's choice of the *system* configuration is appropriate for the proposed site conditions and use.

2.4 The Certificate of Accreditation is valid for five (5) years from the date of issue or until withdrawn by the *Director*.

2.5 Any proposed modifications to the *system's* specified processes, equipment, materials, fittings or manuals must be authorised by the *Director* and may be subject to additional verification and/or testing.

3. Installation and Commissioning

3.1. All plumbing work carried out in connection with the *system* installation must satisfy the requirements of the *Building Act 2016 and the Plumbing Code of Australia* and be carried out by a licensed *plumber* with appropriate training and qualifications.

3.2. All electrical work must be carried out by a licensed electrician and in accordance with the relevant provisions of AS/NZS 3000.

3.3. All pipework that forms part of the installation shall be certified and authorised through the application of the WaterMark Certification Scheme.

3.4. The sanitary compartment containing the *system* must not open directly into a habitable room or pantry unless access is by a permanently ventilated airlock, hallway or circulation space. A permanently ventilated air lock (which may be a circulation space) must be provided with ventilation which the greater of -

a) 8000 mm^2; or

b) 1/500th of the floor area of the circulation space.

Note: Competing appliances such as wood fired heating appliances, gas fired heaters and other forms of mechanical ventilation may need an air intake installed from outside the building. The Rota-Loo units have active vents. Competing appliances and their intake air requirements and venting arrangements need to be taken into consideration.

4. Maintenance and Monitoring

4.1 Each installation must be serviced and monitored in accordance with the conditions of accreditation, the conditions of the *permit* and *manufacturer's* instructions.

4.2 At the end of the second anniversary of the accreditation date and each anniversary thereafter, the supplier must provide a list of all their installed *systems* by anniversary year of installation to the *Director*. The *Director* may randomly select up to 5 (five) or 10% of the installed *system*s (whichever is the greater) from each year of installation. The supplier, at its own cost, shall arrange sampling to be organised by an independent body accepted by the *Director*. Samples for faecal coliforms and salmonella are to be determined by a NATA registered laboratory or laboratory accepted by the *Director*. The results are to be reported to the *Director* by:

a) Address of premises;

b) Date sampled;

c) Sample identification;

d) Faecal coliforms;

e) Salmonella;

f) Service history; and

g) Graphs of accumulative data for faecal coliforms and salmonella results for each anniversary group.

5. Performance

5.1 Maximum design capacity as specified by the *supplier* is up to four (4) persons for the RL650 or eight (8) persons for the RL950.

6. On-going Management

6.1 The mechanical aspects of the system shall be maintained in accordance with the *manufacturer's* instructions and appropriate spare parts such as an extractor fan should be on hand in case of failure, as recommended by the *supplier*.

6.2 The system must be operated in accordance with the following by:

a) Regularly rotate the compost drum;

b) The removal of compost from the *system;*

c) Conducting periodic checks of the system, including liquid drainage (if required) to a suitable land application solution / absorption trench;

d) Conducting periodic checks of the compost moisture level and appearance.

in accordance with the *supplier's* Supplementary Instructions…ver. 071212 and manufacturer's Owner's Manual.

6.3 Unless otherwise directed by the *permit authority*, the composted end product is to be:

a) buried on site within an area where it will not come into contact with consumable plants or surface waters prior to its application to land. The minimum cover of soil over the deposited end product must be 300 mm; or

b) Transported off site to an authorised disposal site.

7. Permitted use

7.1 The *system* is designed to receive and treat human waste from toilet pedestals in domestic premises.

7.2 The *system* is not intended for the disposal or treatment of grey water. See clause 2.2 (b).

8. Winter use

8.1 The *systems* are suitable for continuous or periodic use during the cold winter months.

Note: The *systems* are not insulated. Therefore, in non-heated or non-insulated enclosures/rooms the compost may freeze in the drum.

8.2 Limited Winter Use.

For limited winter use (i.e. only a couple of weekends a month) in cold temperatures, the *system* can be used as a holding tank. However, adequate space must be provided in the Bio- drum. If the drum contains frozen compost it should not be rotated. The fan or extractor must be operated in accordance with the manufacturer's instructions.

Note: These requirements are only applicable to limited use, e.g. planning on using the *system* once a month or so during the winter months. If the *system* is used more frequently during the winter months, the extended winter use conditions apply.

8.3 Extended Winter Use

For continuous use or extended use during winter (i.e. every weekend, or residential use), the *system* must be kept warm (at least 15°C) to maintain the composting activity.

Systems without an in-built heating element may require the use of a space heater or other means of heating the area (such as solar) in order to maintain proper composting temperature.

The fan or extractor must be run continuously in accordance with the manufacturer's instructions.

8.4 *Systems* installed in locations subject to low temperatures, such as Lake St. Clair, Cradle Mountain or the central highlands of Tasmania locations above 900m Australian Height Datum (AHD), must install insulation around the vent pipe.