TDS0038 Issue 2 June 2007

PHOSPHATE REDUCING BioDisc® Units BA – BC

INTRODUCTION

In 1991 the Urban Wastewater Directive was introduced by the European community with the aim to protect the environment from the adverse effects of urban wastewater discharges. Some of the discharges lead to Eutrophication, the enrichment of water by nutrients causing an accelerated growth of algae and higher forms of plant life.

A consequence of this is an undesirable disturbance to the balance to organisms present in the water and to the quality of water concerned.

These nutrients are normally Nitrogen and Phosphorous derivatives. In the UK and other countries with temperate fresh water systems, phosphorous is generally the limiting nutrient. The sources of nutrients can be either point sources, for example effluent from sewage treatment plants or diffuse sources such as run off from agricultural land.

Of the Phosphates introduced into sewage effluents, approx. 55% comes from human waste, and 45% from household waste including detergents.

Phosphorous is a common element found in many forms including polyphosphate (common in detergents) orthophosphate (mostly from human waste) and organically combined phosphorus.

The Urban Wastewater Directive defines the outlet concentration in relation to treatment plant size frequently indicating a phosphate effluent concentration of 2mg/l. sometimes less. This effluent concentration may be requested by the discharge consent agency in sensitive areas where excess phosphate levels will affect the local environment.

APPLICATION

In most small package plant employing biological processes there is very little reduction of phosphorus. A domestic effluent typically contains 10-12 mg/l Phosphate. The only reliable way to reduce the concentration is by chemical addition.

Selection of the appropriate sized BioDisc treatment unit requires each application to be assessed as to the expected daily sewage volume, flow and pollutant load.

BioDisc units are designed to treat domestic sewage and waste water only. All surface water must be excluded. Trade waste, chemical toilet waste etc must not be allowed to enter the unit.

Where the sewage results from commercial premises, the sewage content and strength, together with any toxic inputs must be individually assessed. Influent sewage analysis will be required to verify input loading. Please contact Klargester to select an appropriate equipment design.

Sewage arising wholly or partly from any commercial function requires special consideration as the level of phosphate present may be 3 or 4 times the normal domestic level discharge. The use of waste disposal units should be avoided as they will increase, the volume of chemical dosing required.

EQUIPMENT SUPPLY

Klargester offers a complete wastewater treatment package to provide not only BOD and Suspended Solids reduction but also a reduced phosphate effluent concentration in the discharge effluent.

The package supplied includes a control panel, level sensing probes, a chemical dosing pump, and a dedicated dosing point to ensure optimum mixing of the chemical and effluent.

Chemical must be purchased separately, however the chemical container can be located within the BioDisc unit.

As supplied the unit is ready to operate, however, a commissioning visit is recommended in order to optimise the dosage levels and provide advise on its operation, instruction procedures for chemical top up. Material Safety Data Sheets are provided for the recommended chemical together with details regarding chemical handling and disposal.

Please note there will be an ongoing running cost to cover the cost of chemical used.

Maintenance packages are available to assess the performance of the unit, replenish the chemical and check or adjust the operation of the chemical dosing pump.

Equipment can be provided to retrofit into most installed BioDiscs.

EQUIPMENT PERFORMANCE

The equipment has been performance tested according to annexe B of BS EN 12566 part 3. During these tests, the average effluent results during nominal flow were much better than 20 BOD /30 SS/ 20 NH4 /2 P all as mg/l.

EQUIPMENT OPERATION

BA/BB/BC An IP65 control panel controls all the electrical components. This includes the motor within the BioDisc, the level probes, the dosing pump and the loss of rotation alarm.

The control panel must be connected to a separate RCD at the premises.

The dosing pump operates intermittently to dose a very small volume of chemical regularly. The chemical is dosed via a dedicated dosing point which allows the treated effluent and the chemical to become very well mixed, so that the chemical contacts the dissolved phosphorous compounds. The phosphorous compound is flocculated with the chemical becoming bound together into particles which are retained in the final settlement tank of the BioDisc. No additional settlement tank is required.

To achieve the required reduced level of phosphate in the effluent requires the continual regular dosing of chemical. The chemical container must be regularly replenished and not allowed to run out.

Each BioDisc incorporates Klargester's patented Managed Flow System, which is designed to attenuate shock loads and provide a stable flow regime, enabling the plant to achieve a consistently high degree of treatment. It is this managed flow system which allows excellent mixing of the chemical and contact with the dissolved phosphorous compounds.

EQUIPMENT LOCATION

Where phosphate reduction is required, consideration must be given to the replenishment of the chemical and there should be a suitable access route for delivery of the selected container size.

These units use 25kg containers, No dilution or transfer of the chemical is necessary. When a container is empty, the suction hose must be moved into a full container.

Please see TDS 002 and TDS0099 which provides detailed information about the locating of the BioDisc unit and which provides sizing data. The unit sizes are the same,except please note, in order to accommodate the chemical drum the minimum invert level is 750mm.

BioDisc Units and associated control panels should not be sited in areas liable to flooding, nor should they be recessed into the ground unless effective means are in place to prevent accumulation of ground water.

Where discharge is into a receiving ditch or watercourse, you must site the unit and outfall at a height which ensures that there is no possibility of surcharging the plant.

Please contact us for individual discussions if pumping is required.

Sample chambers are recommended for all installations and are necessary additions where the equipment performance is monitored.

EFFLUENT QUALITY

Standard range BioDisc units are configured to produce a final effluent containing not more than 20 mg/l BOD^5, 30 mg/l Suspended Solids (SS) and 20 mg/l of Ammoniacal nitrogen on domestic waste.

The effluent from units treating domestic effluent fitted with phosphate reducing equipment will contain less than 2 mg/l Phosphate.

Nitrification range units are configured to achieve the same BOD and SS, but providing Ammoniacal Nitrogen of 5 mg/l.

Your quotation will indicate the effluent quality guaranteed, based on your declared daily sewage loading.

Discharge may be to a watercourse or soakaway, subject to the agreement of the local regulating authority or consent of the Environment Agency (England and Wales), the Scottish Environmental Protection Agency, and the Environment and Heritage Service in Northern Ireland.

BRIEF INSTALLATION NOTES

Each BioDisc is supplied with a set of Installation Guidelines which should be regarded as the minimum recommendations & reviewed in the light of specific site conditions. Should you require guidelines in advance of delivery, please request.

- A water supply must be available so that in the case of chemical spillage the chemical can be diluted. A tap located nearby to the plant is useful for maintenance.

BioDisc is the registered trademark of Klargester Environmental

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PIA
Testing Institute
for Wastewater
Technology

PERFORMANCE RESULTS

Kingspan Environmental Ltd.
College Road North, HP22 5EW, Aylesbury
United Kingdom

EN 12566-3
"Small wastewater treatment system for up to 50 PT"

Small wastewater treatment system BioDisc®
Rotating biological contractor

Nominal organic daily load	0.29	kg BOD_5/d	
Nominal hydraulic daily load	1.2	m^3/d	
Material	glass reinforced plastic (GRP)		
Watertightness (water test)	pass		
Crushing resistance (vertical load test)	pass	(also wet conditions)	
Treatment efficiency (nominal sequences)		Efficiency	Effluent
	COD	89.4 %	59 mg/l
	BOD_5	95.7 %	10 mg/l
	NH_4-N	88.6 %	3.8 mg/l
	SS	94.8 %	15 mg/l
Electrical consumption	1.3	kWh/d	

Performance tested by:
PIA – Prüfinstitut für Abwassertechnik GmbH
(PIA GmbH)
Hergenrather Weg 30
D-52074 Aachen

Certified according to
ISO 9001:2008
Notified Body number: 1739

Prüfinstitut für Abwassertechnik GmbH
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This document replaces neither the declaration of conformity nor the CE marking.

Elmar Lancé May 2013

Certificate

353.02C02

Kingspan Water & Energy Ltd.
College Road North, Aston Clinton, Aylesbury, HP22 5EW, UK

EN 12566-3, Annex B
Small wastewater treatment systems for up to 50 PT

Small wastewater treatment system BioDisc +P
Rotating Biological Contactor (RBC) in a GRP tank with chemical dosing equipment

Test report PIA2019-353B47.02
This test certificate is a revised version of test certificate no. 353.02C01.

Nominal organic daily load (influent)	0.28 kg BOD_5/d		
Nominal hydraulic daily load	0.9 m^3/d		
Material	GRP		
Treatment efficiency		Efficiency	Effluent
(nominal sequences)	COD	95.9 %	31 mg/l
	BOD_5	98.0 %	6 mg/l
	N_{tot}*	71.1 %	17.9 mg/l
	NH_4-N*	92.1 %	3.0 mg/l
	P_{tot}	95.4 %	0.3 mg/l
	SS	95.6 %	15 mg/l
Electrical consumption	1.5 kWh/d		

**determined for temperatures ⩾ 12 ° C in the bioreactor*

Performance tested by:

PIA – Prüfinstitut für Abwassertechnik GmbH
Hergenrather Weg 30
52074 Aachen
Germany

This document replaces neither the declaration of performance nor the CE marking.

PIA - Sustainable Certification

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geprüft - tested- testé

Notified Body No.: 1739

DAkkS Deutsche Akkreditierungsstelle D-PL-17712-01-00

Martina Wermter December 2020