

# RADS

Robust Aerobic Digestion System Information Pack

Innovating Wastewater Solutions



| sludge Storage | sludge treatment | sludge reduction |

## The RADS

The implementation of guidelines governing the disposal of sludge, such as the Landfill Directive and the ADAS safe sludge matrix, has created additional difficulties for the appropriate disposal of wastewater sludge. As a consequence all commercial, industrial and Water companies are facing increased operating costs associated with the handling and treatment of sludge. The challenge for all of these water users is to significantly reduce the volumes of sludge that requires transportation and final treatment.

Following several years of exhaustive research and development, WPL are pleased to announce the availability of the Robust Aerobic Digestion System (RADS). Utilising aerobic treatment the RADS is a highly efficient and cost effective solution to consider in all sludge strategy decisions and follows the 'Best Available Technique' under the IPPC directive.

The RADS design incorporates the unique principles of WPL's successful Diamond sewage treatment plant and offers extended desludge intervals. Analysis of data collected from existing installations has shown that desludge frequencies on the RADS are a quarter of those normally encountered on sites with conventional sludge holding tanks.

## Principal Benefits

- Increased desludge intervals - without placing significant biological or hydraulic load on the rest of the plant.
- Reduced tankering costs leading to less vehicle emissions into the environment.
- Up to four times extended desludge intervals.
- Uses reliable side channel blowers requiring the minimum of periodic maintenance.
- Up to 1500 p.e depending on flows and loads.
- Can be used as a stand alone sludge storage unit, or as an addition to existing plant, for the treatment of both municipal and industrial waste.
- No internal moving parts, reducing the need for operator maintenance.
- Low visual impact – below ground tanks.
- No odours - sludge is stored without septicity.
- Scum skimmer option – reduces maintenance requirements

## Process Benefits

- A significant reduction in Biological Oxygen Demand (BOD) and in total and volatile suspended solids through endogenous respiration, resulting in increased desludge intervals.
- Minimal impact on the plant from return liquors during times of high Mixed Liquor Suspended Solids (MLSS) load within the RAD reactor.
- Can act as a buffer during periods of high flow, reducing the likelihood of solids carry over into the bio-zones during storm water flows.
- Coarse bubble diffusers enables excellent oxygen transfer and uniform mixing without bio-fouling
- Minimal footprint - integrated aerobic reactor and clarifier.

## Technical Data and Dimensions

Model	A Inside Diameter (m)	B In ground depth (m)	C Straight height (m)	D Inlet to base (m)	E Cone depth (m)	Weight empty (kg)	Total Capacity (m <sup>3</sup> )
RAD 2.4	2.4	3.0	1.4	1.59	1.6	400	8.1
RAD 3.0	3.0	3.3	1.2	1.73	2.1	500	12.3
RAD 4.0	4.0	3.9	0.9	1.92	3.0	1000	22.6

## Research & Development

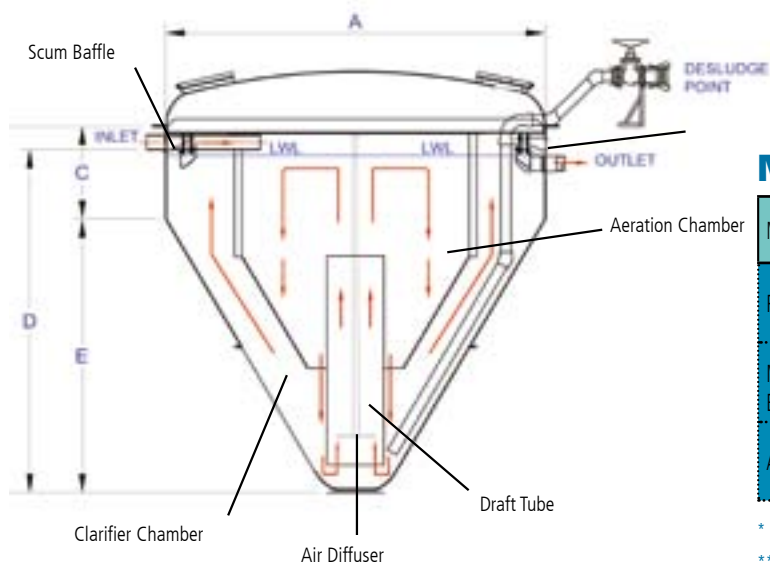
A close partnership between WPL, the University of Portsmouth and investment by the Department of Trade and Industry (DTI), has allowed comprehensive research and development into the RADS. This has enabled independent and in-depth analysis into effluent quality and sludge degradation, monitored to industry standards.

System development has also included clean water trials in controlled conditions. Laboratory tests have included trials using the industry recognised Sodium Sulphite test, to strip the oxygen from the water body before re-aeration. These trials have resulted in the development of a bespoke coarse bubble diffuser and the optimisation of the internal configuration of the system.



## Process Description

- Sludges are fed to the unit through the inlet pipe to the central reactor chamber; a circular tank with a sloped open base.
- Located in the centre of the aeration chamber is a draught tube. The draught tube contains WPL's bespoke coarse bubble diffuser which feeds process air to the plant.
- As the diffused air rises in the draft tube a venturi effect is created, which circulates process fluid around the reactor, allowing suspended growth aerobes to stabilise the sludge and reduce its volume by endogenous respiration.
- A recycling loop is generated in the reactor in which aerated sludge continuously settles to the bottom of the tank and is drawn back up through the draft tube.
- Surrounding the aeration reactor is the integrated clarifier. As sludges continue to enter the aeration chamber, liquors are displaced from the reactor to the clarifier, in which quiescent conditions allow suspended material in the effluent to settle and be re-entrained into the aeration zone.
- The clarified (treated) effluent flows up through the clarifier and over a V-notch weir, which extends around the periphery of the tank.
- The effluent collects in an outer trough where it is discharged through a 110mm (RAD 2.4) or 160mm (RAD - 3.0 & 4.0) pipe connection. A scum baffle located inside the overflow weir prevents floating solids from passing over the weir.



## Model Range & Flow Rates

Model	RAD2.4	RAD3.0	RAD4.0
Population equivalent	20-750	750-1200	1200-1500
Maximum organic loading BOD/day (kg)*	45	72	90
Air input m <sup>3</sup> /hr **	24	40	74

\* System design assumes peak flow must not be more than 3 x dry weather flow.

\*\* Compressor manufacturer's data is an approximation to plant conditions.



**400 pe - golf club near Loch Lomond**

**1500 pe - service station near Sutton Scotney**



## Servicing

The RADS unit requires minimal operator servicing beyond periodical desludging provided the unit is operated within design specification.

Blowers supplied with the unit are of side channel type and require periodic maintenance. It is recommended that the blower is serviced in line with the manufacturers guidelines.

## Warranty

The RADS range is supplied with a 24 month warranty on the plant and air compressor.

## Delivery

Deliveries within mainland England, Scotland and Wales can normally be guaranteed within ten working weeks. Please contact a member of WPL if you require delivery sooner or have specific requirements.

## Field Trials

RADS have been extensively field tested at both WPL's research facility, at wastewater treatment works and on industrial waste producing sites to ensure reliability and confident process guarantees. Thorough analysis ensures maximum treatment performance and underpins WPL's ongoing commitment to process improvements and new product development.

## System Components and Materials

Tank • Glass Reinforced Plastic (GRP), Polypropylene, PVC, stainless steel fixings and corrosion resistant reinforcements.

Blower • Side channel type.

WPL is recognised internationally as a principle designer and manufacturer of high quality package and turnkey sewage treatment systems, and grease management solutions.

It has over 14 years' industry experience and services an extensive customer portfolio comprising the UK's major water utilities, all areas of the commercial sector and the domestic market place.

The company's consistent focus on ecology, coupled with extensive research & development into new technology, have enabled it to far exceed all existing and proposed discharge consent standards enforced by the Environment Agency, SEPA and other regulatory authorities.



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