

Focusing On The Fundamentals

By Alfa Laval

The Challenge

Virtually all commercial and industrial activities produce waste products that have to be disposed off, but are harmful to the environment unless treated. Virtually all such activities result in the production of sludge that is normally of little or no commercial value, but is bulky and costly to transport. Disposing of such sludge responsibly represents a big challenge.

All wastewater treatment plants produce residual sludge. The majority of such plants have to install special processing equipment to minimise the costs and the environmental impacts associated with processing, transporting and disposing of this sludge.

Sludge Processing Technologies

The products most commonly used in sludge treatments are drum thickeners for reducing sludge volume by as much as 90%, and decanter centrifuges for subsequent sludge dewatering. Other equipment widely used in wastewater treatment includes spiral heat exchangers and membrane filtration bioreactors.

Breaking New Ground

However, one particular new product range has been attracting considerable worldwide attention because it represents a major shift in the basic commercial equations behind separating the liquid and solid components in sludge flows.

Alfa Laval recently launched the breakthrough ALDEC G3 decanter centrifuge. This unique design represents a practical revolution in decanter centrifuge performance and energy efficiency, introducing new parameters for what companies can achieve with their sludge separation operations. These include:

- Savings of as much as 40% on energy costs for any given separation capacity
- Increases of up to 10% in sludge processing capacity for any given equipment footprint

In the specialised world of removing water from sludge, technical progress usually consists of small increments and marginal, evolutionary improvements. It is relatively rare that



Figure 1: ALDEC G3 decanter centrifuge

the basic performance benchmarks and operating parameters get altered in such a big way, which is exactly what has happened with the introduction of the ALDEC G3 design.

The innovative design of the new ALDEC G3 decanter centrifuge range delivers 10% better performance capacity while reducing power consumption for any given separation capacity by as much as 40%.

This can reduce power consumption by as much as 0.50 kW/hour, per cubic metre of sludge, which in turn reduces CO2 emissions and environmental impacts. These dramatic savings stem from the Slimline configuration, and from the use of patented Alfa Laval's 'Power Plates'. These are an integral part of the ALDEC G3 design, and reduce the loss of kinetic energy when the liquid leaves the bowl.

ALDEC G3 decanter centrifuges are also equipped with an Alfa Laval 2Touch control package as a standard practice. This makes it easy to fine-tune and improve productivity throughout the service life of each ALDEC G3 unit.

Making Separation Much More Efficient

The new ALDEC G3 decanter centrifuge features multiple innovative design features that combine to provide significant improvements in separation performance. These include a steep cone angle, the Slimline design with progressive pitch, and patented energy-saving power plates.

The smaller conveyor diameter makes room for more liquid in the pond, resulting in increases of up to 10% in the separation capacity for any given equipment footprint. Moreover, the

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Figure 2: Slimline conveyor

higher hydraulic pressure inside the bowl means only the very driest fraction of the sludge cake passes into the casing through 360° of solids discharge openings, resulting in either drier cake or using less polymer.

Breakthrough Benefits

ALDEC G3 decanter centrifuges for sludge separation ensure:

- Up to 40% lower power consumption, and reduced CO2 emissions
- 10% boost in processing capacity — or drier cake
- Lower polymer consumption
- More efficient bio-solids handling
- Lower operating and maintenance costs
- More accurate process monitoring and control.

The ALDEC G3 decanter centrifuge design provides significantly improved separation results and better control of all the variables, using up to 40% less energy. Lower power consumption saves money while also improving environmental profiles.

In addition the unique ALDEC G3 design enables the operator to work with different combinations of: bowl speed, conveyor

speed, pond depth and feed rate to meet each operator's changing needs and different priorities.

Counting The Real Costs

The big lesson to be learned from this latest separation technology breakthrough is that it is now possible to significantly reduce the day-to-day operating costs of sludge separation installations in both industry and the public sector, and for both contractors and operators.

Those with overall long-term responsibilities for running a dewatering facility need to do a thorough assessment of the operating costs that pile up day after day, instead of just focusing on the upfront purchase price. The unique ALDEC G3 design has just made running such facilities a whole lot cheaper.

About The Article

This article has been contributed by Alfa Laval. Alfa Laval is a world leader in sludge separation technologies – and has now rewritten the rules on ensuring profitability in wastewater treatment facilities. <http://www.alfalaval.com>