Many corn wet-milling plants want to increase production capacity, but are challenged by limited floor space. Solve the problem by switching from rotary vacuum drum filters to decanter centrifuges in the gluten dewatering process. This substantially frees up production space, and reduces energy consumption for subsequent drying.

Alfa Laval in brief

Alfa Laval is a leading global provider of specialized products and engineered solutions.

Our equipment, systems and services are dedicated to helping customers to optimize the performance of their processes. Time and time again.

We help our customers to heat, cool, separate and transport products such as oil, water, chemicals, beverages, foodstuffs, starch and pharmaceuticals.

Our worldwide organization works closely with customers in almost 100 countries to help them stay ahead.

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com

PPI00457EN 1202

Corn gluten dewatering

Free up production space and lower your energy consumption

- Free up production space
- Reduce energy consumption
- Easy operation
- Closed system with full odour control

Free your space

Available space often a bottleneck
Higher production capacity is on many plant owners' wish list. But space constraints hinder major revamps at many sites. The production area cannot be expanded and there is no room for additional equipment.

A common bottleneck for expansion of corn wet-milling plants is gluten dewatering. Traditional rotary vacuum drum filters (RVDF) often occupy up to 20% of plant floor space for wet milling equipment. Expanding production on available floor space when using RVDFs is more or less impossible.

Increase capacity on existing floor space
For most plants, gluten dewatering holds a golden opportunity to free up production space. The solution is to use decanter centrifuges instead of RVDFs for dewatering.

The required floor space for a decanter centrifuge system is about 1/3 of that for a corresponding RVDF. This means production capacity can be doubled

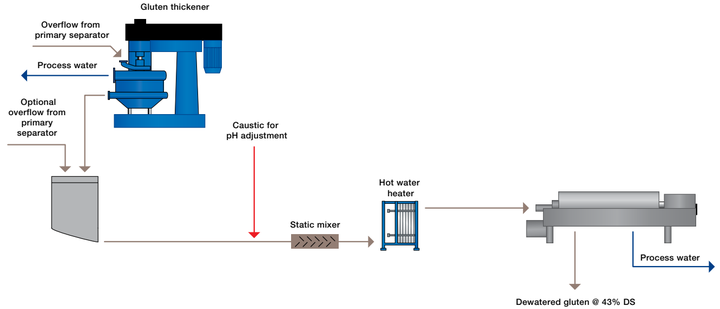
and 1/3 of the RVDF area is freed up for other equipment.

Gluten thickener
Another advantage with decanter centrifuges is that they operate at a much lower gluten concentration, typically 25–50 g/l compared to 130–150 g/l for RVDFs. For small and medium-sized plants (< 300 MT/day) this means the same gluten thickener can be used after a revamp without any need for further gluten thickeners.

In some cases the gluten thickener can be omitted altogether, freeing up even more space.

Lower energy costs
Corn gluten dewatered using decanters is dryer than that from RVDFs. The output from an RVDF is usually 39–40% dry solids, and up to 43% from a decanter. The lower water content means less energy is needed for drying.

Process overview



At the heart of the dewatering process is an Alfa Laval decanter centrifuge together with a pH and temperature control system.

Gluten is collected in a tank after exiting the gluten thickener or primary separator. Before entering the decanter, the gluten is heated to 55–60°C (130–140°F). Heating is provided by a heat exchanger on a hot water loop. This way the heating surface can be kept below 60°C (140°F) to avoid burning or heat coagulation on the heat transfer surfaces.

The pH level of the gluten is then adjusted to the isoelectric point (pH 5.2–6.2) by adding a caustic solution. This increases the dewatering ability and the yield by reducing the water absorption of the gluten.

Gluten particles are separated from water in the decanter, resulting in gluten cake with approximately 43% dry solid content. The water from the separation is reused as process water.

Designed for the starch industry

The STNX range of decanter centrifuges was designed and built to fulfill the specific requirements of the starch industry.

Drawing on Alfa Laval's long experience of decanter centrifuges for the food and process industries, the STNX range offers unrivaled performance and reliability.

Thanks to the well-balanced, straight-forward design, and unique control systems, STNX decanter centrifuges operate more reliably and more efficiently than any other comparable equipment.

The STNX is controlled by a 2Touch control system that adapts the operation to process variations, saving energy and improving performance. The 2Touch control system also monitors a series of operating parameters to ensure easy, safe and reliable operation at all times.

Operating principle
A decanter centrifuge dewaters gluten using centrifugal force. Gluten is fed into a rotating, cylindrical bowl. The suspended gluten particles have higher density than water, which means the centrifugal force causes them to separate from the water and build up on the wall of the bowl.

A screw conveyor in the bowl transports the dewatered gluten to the conical end of the decanter where it is discharged. At the same time, water exits the bowl at the other end and is led back to the process.

Continuous, easy operation
Decanters operate continuously in a totally closed system with full odour control. The system requires only minor attention from operators, and is kept clean as the decanter is equipped with a CIP (Cleaning In Place) nozzle manifold and CIP sequence in the 2Touch control system.

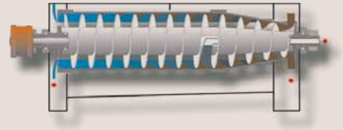
All parts in contact with gluten are made of stainless steel.

Alfa Laval and the starch industry

Alfa Laval is one of the world's leading suppliers of process technology to the starch industry. For more than 80 years we have been helping starch producers across the globe stay ahead of the competition. We have the experience, know-how and equipment to help you make the most of every phase of your starch production line.

Our specialized engineering teams can help optimize your starch processes and be a strategic partner in all aspects of production. We offer high-performance solutions for evaporation and condensation, screening and filtration, centrifugal separation, membrane filtration, heating, cooling, and fluid handling.

Our technology will save you money. We know how to maximize your uptime, and minimize water and energy consumption. For the benefit of both your bottom line and the environment.



A decanter centrifuge uses the centrifugal force to separate suspended solids from the liquid. The solids are discharged at one end of the decanter and the clarified liquid at the other.