



Increased capacity and better performance from Alfa Laval's 3-phase starch decanter

Cargill wheat starch factory, Poland

Case story



The most crucial step in the wheat starch production process is the splitting of the wheat dough into the various component streams for downstream processing.

This has traditionally been done in 2-phase decanters or in hydrocyclones. However, the 3-phase decanter is increasingly becoming the preferred solution within the industry.

In the modern world of starch production, where margins are tight, high performance and reliable equipment are keys to the successful operation of a plant. By combining more than fifty years of experience in the design of decanters with our detailed knowledge of the starch extraction process, we are able to offer separation equipment with industry-leading performance and reliability.

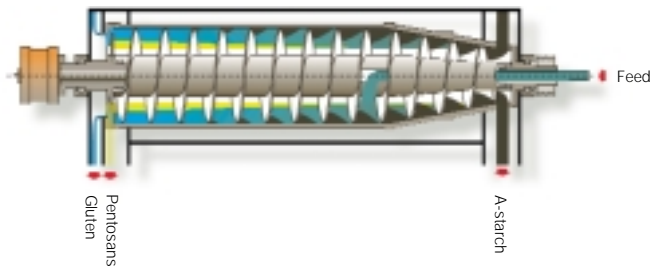
When Cargill decided to increase the capacity of their wheat starch factory in Poland, the company turned to Alfa Laval. What they needed was a cost-effective and reliable solution - which is exactly what they got, with the new Alfa Laval STNX944 decanter.

The Cargill Poland site manager explains:

"In mid-2001, as part of our capacity expansion, we were looking for a high-capacity 3 phase decanter that matched, or preferably improved on, the separation performance of the existing 3 phase splitter. We had already established good cooperation with Alfa Laval, and when they presented us with the data on their new decanter, we were very interested in the simplicity of its design and the high capacity that Alfa Laval claimed for the machine. So it was agreed that we would perform an on-site test of the decanter performance, supported by AL engineers.

Almost eight months on, we have been impressed with the performance of the machine. The capacity claimed by Alfa Laval has not only been met, but exceeded, and the stream separation has met our expectations. We have also had very good cooperation with Alfa Laval personnel, including the local organisation in Poland.

So, in December 2001, we purchased the decanter and it is now in full production."



Alfa Laval STNX944 3-phase wheat decanter

The benefits to the customer

- High capacity - the STNX944 can handle up to 10 tons of wheat flour per hour with a high-quality, reliable 3-phase split.
- High-quality "A" starch and gluten, with a high starch yield.
- Simple design, making for ease of operation and lower maintenance costs.
- Reliable, proven technology assures the best possible equipment availability.
- The STNX944 does not require a paring disc, unlike other comparable machines. This translates into a significantly lower installed power and lower heat input.
- Splitting of the different phases by density allows regulation that is independent of flow.
- In contrast to our competitors' machines (where either a fixed nozzle or an adjustable paring device is used for discharge of one of the phases), no additional dilution water is required by the STNX944.

Technical features

- A DSC (differential speed controller) controls the back drive system and provides protection for the decanter against blockage and overload of the gearbox.

- The erosion-protected plough tiles give superior solids transportation with reduced heel torque, which reduces the amount of scrolling power required.
- The forward feed zone has a high swallowing capacity and accelerates the feed very smoothly.
- The 360° solids discharge gives a very large solids discharge area with very low power loss.
- The main motor is mounted inline on vibration dampers - a very compact design that is easy to install as well as being mechanically reliable.

Working principle

Separation takes place in a horizontal cylindrical bowl equipped with a screw conveyor. The slurry is fed into the bowl through a stationary inlet tube and smoothly accelerated by a specially designed inlet distributor.

Centrifugal force causes instant sedimentation of the solids on the wall of the bowl. The conveyor, which rotates in the same direction as the bowl, but at a different speed, conveys the solids phase (containing gluten-free "A" starch with very low protein content) to the conical end. Here the solids are lifted clear of the liquid and centrifugally dewatered before being discharged through the solids discharge outlet in the vessel.

Both the purified heavy liquid phase (containing high-quality gluten with an optimal consistency) and the light liquid phase (containing pentosans and other gluten-free soluble compounds), leave the cylindrical end of the decanter through two sets of weir discs, both open to the atmosphere.

The decanter centrifuges can be adjusted to suit individual requirements by varying feed rate and rotational speed, differential conveyor speed, pond depth in the bowl or the interphase setting between heavy and light liquid.

Technical data STNX944 decanter

Bowl speed max.	rpm	2900
G-Force max.		2703
Bowl diameter	mm	575
L/D		4.24
Rotor weight max.	kg	3000
Static load max.	kg	7500
Dynamic load Vertical/Horizontal	kg	$\pm 1.2 \times \text{Static Load} / \pm 0.5 \times \text{Static Load}$
Maximum installed power	kW	160
Sound pressure level ¹⁾	dB(A) re 20 mPa	87 dB(A) re. 1 pW

1) Declared A-weighted emission sound pressure level in free field over a reflecting plane at 1 m. distance from the decanter operating at maximum bowl speed.

How to contact Alfa Laval

Contact details for all countries are continually updated on our website. Please visit www.alfalaval.com to access the information direct.