

## **Starch modification**

Improved freezing and dew stability



# Modification treatment

## Adjusted to raw material



▲ ANDRITZ Gouda drum dryer

Starch modification leads to a structural change in the starch and is achieved through physical, enzymatic, and chemical applications (or combinations thereof). The modification treatment is adjusted to the properties of the raw material, which can be obtained from potatoes, cereals, rice, and so on. Depending on the expected functionality in products like infant cereals, sweets, and beverages or products like paper or textiles, the starch has to be modified in different ways. In close co-operation with experienced partners for recipe development, ANDRITZ Gouda offers turn-key processing solutions for starch modification, from the initial design, through laboratory tests and engineering, to delivery of the required industrial equipment.

### The process

If the starch is not available in liquid form, the native starch is mixed with water to form a suspension with the required total solid content. In the next step of the process, the starch is modified. The choice of modification is based on the results of the corresponding tests in the ANDRITZ Gouda pilot plant. After starch modification, the product is dried on the ANDRITZ Gouda drum dryer.

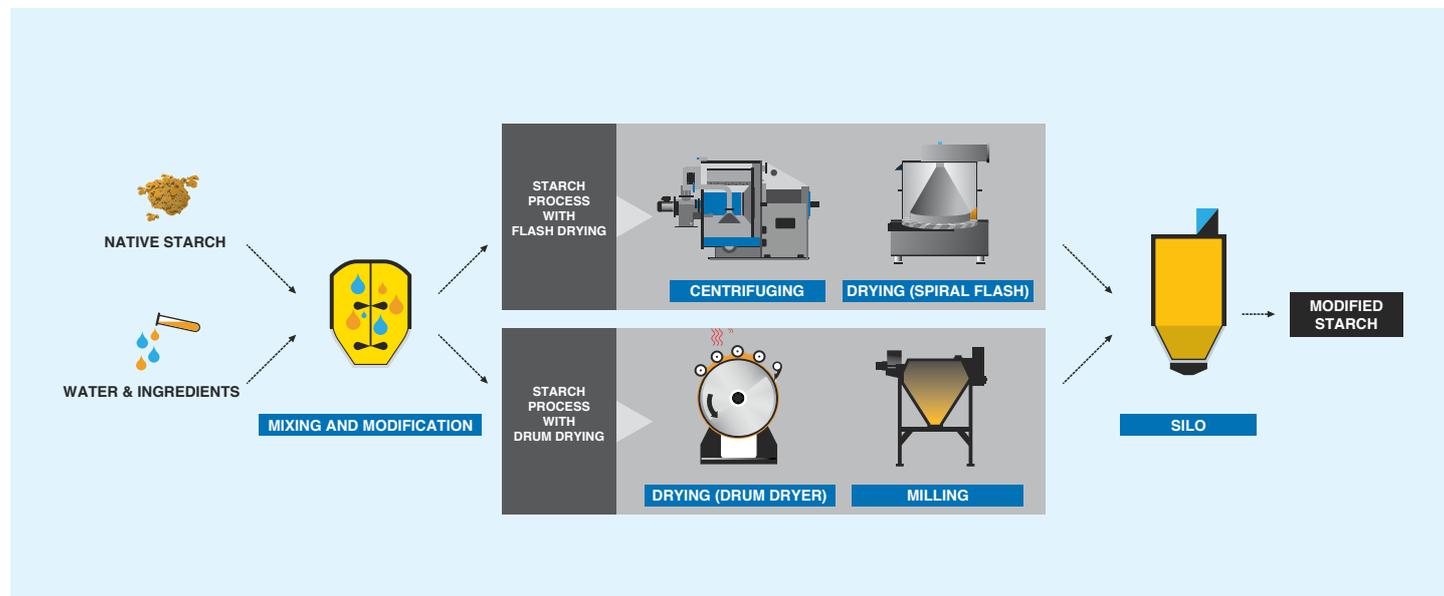
The ANDRITZ Gouda drum dryer is the heart of the installation. It mainly consists of a cast-iron cylinder that is heated inside by means of saturated steam. The modified starch concentrate is fed between the applicator rolls, allowing easy control of the product supply. The kneading effect of

the applicator rolls avoids the formation of lumps in sticky products. Perfect distribution over the entire length of the drum makes the system ideal for processing doughy or pasty products. Moreover, the rolls enable a thin layer to be built up the hot surface of the drum.

Inside the drum dryers, the cylinders are heated with saturated steam, which condensates on the cylinder wall, allowing the best possible heat transfer. The condensate is extracted continuously from the inside of the drum, providing the maximum possible free surface for steam condensation inside the drum dryer. The drums are heated by steam in a closed loop so that there is no contact between the heated

# The process

## A closed loop steam system



▲ Starch modification process

steam or its condensate and the product to be dried. As a result of the product coming into contact with the heated outside of the drum cylinder, the water in the thin product film is evaporated. When the cylinders have rotated through two-thirds of a revolution, the solid matter is scraped off the cylinders with a knife.

### Knife holder

The clever design of the knife holder guarantees even knife pressure over the entire length of the drum. The use of specific materials prevents vibrations that result from scraping and guarantees uniform product removal. The knife pressure can be controlled easily from outside the process area.



Starch drying on a drum dryer ▲

### Dried starch transport

One discharge screw and a pneumatic conveying system transport the dried starch to the downstream process steps before it is packed or stored in a silo. The drum dryer is available in a variety of sizes, from 0.75 m<sup>2</sup> up to 28 m<sup>2</sup>. More than 1.000 ANDRITZ Gouda drum dryers for this application are operating around the world.

### Benefits

- Improved solubility
- Improved organoleptic quality
- Improved freezing and dew stability
- Less gel syneresis
- Increased cloudiness of gel and films

## ANDRITZ Gouda

ANDRITZ Gouda has been implementing complete process solutions for the environmental, chemical, and food industries for over 100 years. As a machine manufacturer as well as process solutions expert, ANDRITZ Gouda is able to handle all of the stages involved in designing and building plants, including engineering, service, installation, and commissioning.

ANDRITZ Gouda, as part of the international ANDRITZ GROUP, has several pilot plants available to test new materials, generate design data, and provide representative product samples. The proven calculation model for scaling up to industrial size ensures successful application in full-scale processing.



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