ProFlow

Division of Burt Process Equipment

Continuous Enzymatic Starch Conversion Systems

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Continuous Enzymatic Starch Conversion Process

Reduce Starch Costs | Maximize Asset Use | Improve Performance

Controlling Operating Costs, Reducing Risk, & Maximizing Efficiency

Processed starch can be a tremendous expense for pulp and paper mills. It is necessary for wet-end sizing and wet-end retention systems, and can be used as a surface sizing agent to improve stiffness, brightness, opacity, and printing quality. It can also be used for paper coating and as an adhesive in corrugated board, laminated grades, and other products.

HENAN PROCESS SYSTEMS BV

ProFlow, in partnership with Henan Process Systems BV, makes it possible for pulp and paper mills to use raw starch in their processes, by bringing the starch converting process in-house. This is a cost-effective solution that is used throughout Europe and Asia, and is gaining popularity in the United States.

An easy, cost-effective way to control viscosities and other variables during the starch conversion process

ProFlow's **Continuous Enzymatic Converter** allows mills to use the more cost-effective unprocessed starch in their plant, by continuously converting raw starch directly at the process, which saves money in raw materials and reduces loss of material, compared to batch processes.

A fully automated continuous enzyme conversion system installed at the paper mill can pay for itself in as little as one year through:

- Eliminating the need for expensive factory-processed starch
- Minimizing variability in makedown and starch solids
- Reducing the hassle surrounding batch storage, such as pH monitoring, temperature monitoring, ongoing agitation, and storage tank cleanliness
- Securing stable size press operation

The Process

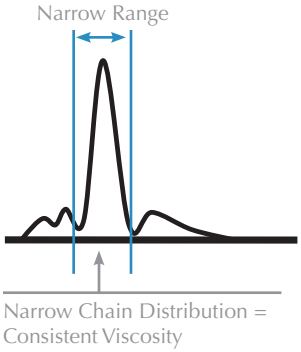
In a surprisingly simple process, the continuous enzyme conversion system makes it possible to convert all types of raw starch—including corn, waxy maize, tapioca, potato, and wheat—using custom configurations to produce the precise viscosities and variables that are required for uniquely specified products.

First, the dry starch slurry is slurried with enzymes in hot water at 185 °F. The enzymes break down the starch molecules, so they can be used in the process. A steam injection at the end of the process deactivates the enzymes.

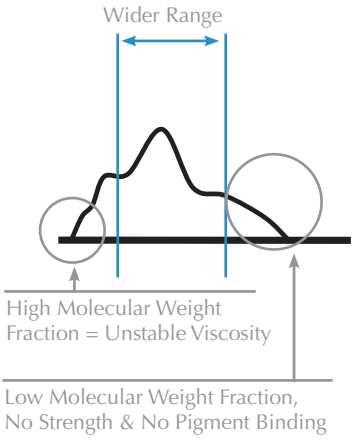
Why is molecular weight important?

The secret for quality is narrow molecular weight distribution, which results in a highly consistent viscosity.

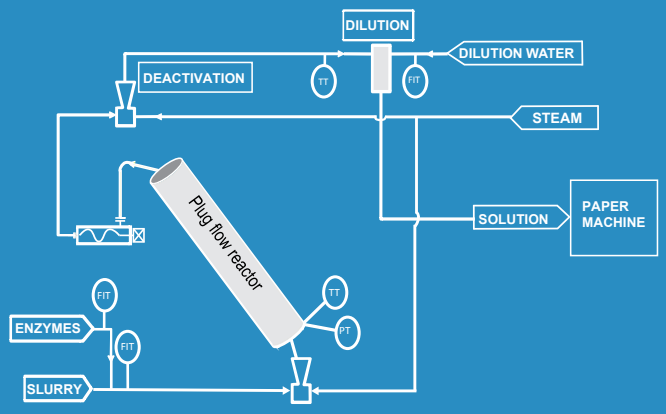
Continuous Process (Plug Flow Reactor)



Semi Continuous Process (Batch Process)



This process produces an extremely tight molecular weight distribution, which allows the system to maintain a highly consistent viscosity and also ensures a high-quality product and improved control at the press operation within the paper machine. As a continuous process, only the starch that is needed is converted. In the event of an unplanned system shutdown, the system will flush automatically.



ProFlow uses a continuous conversion plug-flow principle that minimizes viscosity fluctuations, resulting in a stable size press operation.

The benefits of a continuous enzymatic conversion system include:

- Denatures the enzymes to reduce viscosity breakdown in storage tank
- Minimizes starch gelling
- Reduces viscosity fluctuations
- Offers high repeatability to keep paper quality consistent
- Assists with demand management
- Achieves fast response time of <10 minutes
- Requires less space
- Accommodates different recipes for different grades of paper

Reactor System

Model #	L	W	H	~Weight
Magician 500	86″	78″	110″	1,875 lbs
Magician 1000	86″	78″	134″	2,325 lbs
Magician 1500	94″	78″	196″	2,600 lbs
Magician 2500	96″	82″	220″	3,550 lbs

Power Requirements: *460 VAC, 3 Phase, 60 Hz standard. 380, 415, 575 VAC and 50 Hz optional*

Note: *Optional reactor configurations are available for limited ceiling height areas.*

Features

- 500-5000+ lbs/hr
- 99.9% conversion yield
- Enzymatic conversion of all types of starches
- Narrow molecular weight distribution = consistent viscosity
- Negligible glucose levels that can lead to starch loss
- Fast response time (< 10 min) to variations in machine demand
- Different recipes for different grades
- Solids up to 40% plus
- Compact design/small footprint
- Automatic flush
- Stainless steel frame and piping
- Pre-piped, pre-wired, ready to operate
- Fully automated
- NEMA 4X-SS, UL & cUL control panels
- DCS or standalone control
- Optional remote support via modem

Optional Equipment

- Bulk Starch Storage (Silo)
- Bulkbag Unloading Systems
- Slurry Makedown Systems
- Enzyme Storage & Metering Systems
- Slurry Metering Systems
- PLC/HMI Control System

SLURRY SYSTEM

ENZYME STORAGE AND METERING SYSTEM

ProFlow & HENAN—Partnering to Deliver Efficient and Safe Solutions to the Pulp and Paper Industry

Based in Netherlands, HENAN Process Systems is an innovative supplier of jet cookers, enzymatic converters, dispersion equipment and various other machinery types for many industries, including pulp and paper. ProFlow & HENAN joined forces in 2012 to provide sales, service, support, and fabrication facilities in Schildwolde, Netherlands, Connecticut, USA, and Shanghai, China.

This partnership allows ProFlow to use the highest quality equipment in our custom-engineered solutions. Our customers take advantage of ProFlow's 40+ years of experience in the paper chemical and starch equipment service for the highest levels of engineering, manufacturing, and service.

ProFlow
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ISO 9001 certified
PERRY JOHNSON REGISTRARS, INC.
ANAB ACCREDITED

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