

HIGH FRUCTOSE CORN SYRUP STARCH COOKING



SUMMARY

Goals:

- Completely cook starch
- Eliminate downstream static mixer
- Operate under varying conditions
- Eliminate hammer

Accomplishments:

- Installed Automatic Hydroheater
- Complete, uniform starch cook-out
- Smooth operation over varying flow rates and temperature requirements
- Eliminated hammering
- Eliminated static mixer

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A major U.S. high fructose corn syrup producer experienced difficulties cooking corn starch in the liquefaction stage with a competitive jet cooker. The competitive jet cooker was unable to provide completely cooked starch and required a static mixer downstream. Besides, the competitive unit could not operate under the varying production rates dictated by seasonal demands without hammer and instability.

SYSTEM OPERATING RANGES

Fluid:	38% Corn Starch Slurry
Flow Rate:	1,050 GPM [238 m ³ /hr]
Inlet Temperature:	125°F [52°C]
Discharge Temperature:	225°F [107°C]
Steam Supply Pressure:	150 PSIG [10.3 barg]

SOLUTION

Hydro-Thermal® installed an Automatic Hydroheater®. The Hydroheater is the only jet cooking device that provides a fully adjustable mechanical shear force to ensure a complete, uniform cook-out of starch. Internal modulation of steam in the Hydroheater provides unlimited steam flow turndown for smooth operation over varying slurry flow rates and temperature requirements. The simple geometry of the Hydroheater allows it to operate day in, day out without plugging or fouling. The hammer-free operation, due to the internal modulation of steam, assures precise temperature control of the cooked starch.

The producer's cook is complete and uniform, with a homogeneous solution provided for saccharification. The static mixer has been eliminated from the system. The plant can now operate under variable production demands while maintaining a consistently high-quality cook from the Hydroheater. Downtime has not been required for cleaning the Hydroheater due to its self-cleaning design.