

ELIMINATING STRAW BUILD-UP IN CORN GERM COOLING

INNOVATIVE TECHNOLOGY FOR ENERGY-EFFICIENT OPERATIONS

Background

Innovation in heat exchange comes in many shapes and sizes. In this case, it measures 60" x 60", weighs about 500 pounds and solved a headache nearly a decade in the making.

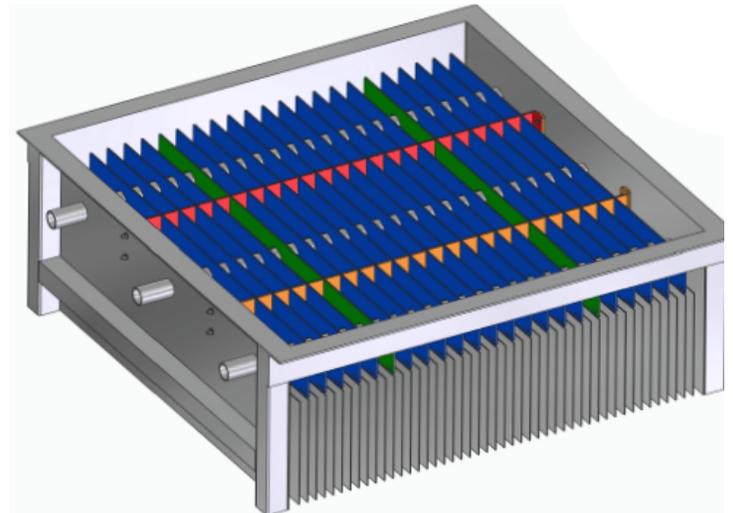
In late 2020, a North American food producer approached Solex Thermal Science with a challenge they had with their existing indirect heat exchanger.

Straw that was coming with the corn germ into their cooler was matting along the top of the upper plate bank. This was causing plugging that reduced the efficiency of the equipment and led to increased downtime. Left untouched, the straw buildup also had the potential to spoil the product.

To mitigate this risk and maintain equipment efficiency, plant operators were going in daily to pneumatically remove the straw. The process was not only tedious, but added unnecessary labour hours to the process.

The solution

Looking to reduce straw accumulation, Solex custom-designed an inlet hopper screen to act as a product flow aid for the troublesome straw.



Placed on top of the first plate bank of the heat exchanger, the screen features a series of parallel bars supported by bolt-in cross-beams. The bar spacing is wider than the plate spacing below. This encourages larger pieces of straw to rotate and/or tip. The straw then aligns with the flow of corn germ going into the more compact plate bank. This results in the straw passing cleanly through the heat exchanger without build-up or plugging.

Solex had previously applied a similar solution with staggered plates to newer heat exchangers.



Special considerations

The Solex team also had to consider how to install the new screen. Access through the top of the inlet hopper posed numerous challenges, including:

- Having to disconnect the unit from the upstream devices
- Removing the inlet cover, instrumentation, wiring and more.
- Reinstalling the components

That ruled out pre-welding a complete grid that would have needed to be dropped through the top of the exchanger.

Solex instead created an Ikea-style kit that plant personnel could assemble and fasten within the inlet hopper, and accessed through a side access door.

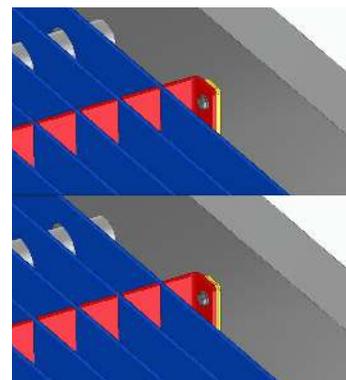
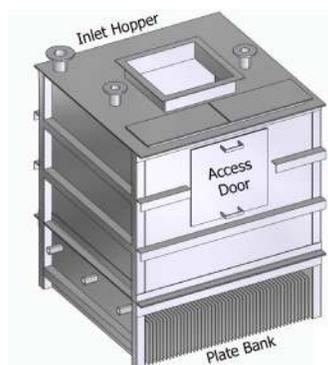
Each part was labelled with a corresponding number. An easy-to-follow 11-step guide – which included images of each step – guided operators through the retrofit. In fact, the kit shipped flat with the pieces in place, so plant operators could see what it should look like reassembled.

Benefits

The benefit of going through the side of the inlet hopper instead of the top meant a shorter downtime and a simpler installation. Welding was also eliminated — as was the need to obtain a hot work permit. Instead, the bars and support beams self-squared within the unit and bolted into the side of the hopper.

Feedback

The screen shipped at the end of February and installed in late March. Response from the customer was the installation went quickly, with minimal downtime required.



The side panel on the inlet hopper provided plant operators with better access to install the screen.

Spacers provided even distance between the screen bars while bolts avoiding the need for welds.

And after having to remove the straw daily for nearly 10 years, the customer reports they have not had to clean the inlet hopper since installing the Solex screen.

Solex's technical services team is available to answer any questions regarding maintenance, parts, training, equipment optimization and more. Email tech-services@solexthermal.com to consult with a member of the team.



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