



Brewing a better yeast propagation process

Powerful yeast mixing at Leinenkugel's raises process efficiency

Case Story



A heritage of excellence

For six generations, the Leinenkugel family from Chippewa Falls, Wisconsin has been brewing America's friendliest craft beer. Under the guidance of Jake, Dick and John Leinenkugel, the brewery continues to thrive, keeping true to the history and heritage established by their great-great grandfather more than 145 years ago.

To accommodate the growth of craft brewing seen in the 1990s, Leinenkugel's added a second small brewery to their operations in 1995. The 10th Street Brewery in Milwaukee, Wisconsin now helps to handle the increased demand of a growing number of fans

– and with more than 350,000 card-carrying “Leinie Lodge” members, demand remains high.

A delicious secret at the 10th Street Brewery

The 10th Street Brewery produces an ever-evolving family of beers, including Leinenkugel's Big Eddy series of premium craft beers, featuring styles like Wee Heavy Scotch Ale, Baltic Porter, Russian Imperial Stout and Imperial IPA. Leinenkugel creates each of these complex, high-end styles from dozens of ingredients, along with a secret yeast culture referred to as “007.” The outcome is highly flavorful beers with higher than normal alcohol by volume (ABV) of around 10%.

The challenges of specialty craft beers

As part of the brewing process, yeast is added to unfermented wort to begin fermentation. This process is referred to as “pitching yeast.” For many types of beers, yeast can simply be reused or “re-pitched” from batch to batch. However, the very high ABV of the Big Eddy series results in a more stressful fermentation process and low yeast viability at the end of fermentation. As a result, the yeast cannot be serially re-pitched, but instead must be freshly propagated for each batch.

Stirring up a better solution

Knowing a better yeast handling solution was needed to improve the efficiency of brewing Big Eddy beer, the Leinenkugel engineering team reached out to Alfa Laval for consultation. As a result, the Alfa Laval magnetic mixer was specifically engineered into the 10th Street Brewery’s yeast propagation tank to handle their process’ unique challenges.

Leinenkugel’s uses a vessel with a top-mounted agitator to propagate the yeast. Once the agitator is operating, a perforated pipe introduces gas to support propagation. Beer is produced as a by-product of this process. However, Leinenkugel’s does not want to dilute the Big Eddy’s wort with this by-product beer due to its lower alcohol content and flavor profile, so they allow the yeast to sediment and then decant the beer off. The resulting yeast slurry can have a consistency above 70% spin-down solids.

The Alfa Laval Magnetic Mixer UltraPure stirs this thick yeast slurry to keep it homogeneous, and to control its temperature until it can be pitched into the fermenter. Due to its levitated design, the mixer is easy to clean between batches, and thanks to its bottom-mount location, the mixer stirs the slurry effectively even at low volumes – helping to efficiently drain the tank as a secondary benefit. These results also show that the mixer is suitable for other production challenges, such as mixing in yeast brinks.

Tapping into savings on yeast

In the past, they purchased a liquid yeast culture for pitching but now by propagating their own yeast in-house,



Greg Walter, Master Brewer/Facility Manager, Jacob Leinenkugel Brewing Company



About Leinenkugel's

Year established:

1867 – the nation’s seventh oldest operating brewery

Brewery locations:

Chippewa Falls and Milwaukee, Wisconsin

Distribution:

The 48 continuous United States, plus abroad as far as Japan

Number and styles of beer:

All styles represented, with approximately 16 different craft brews

they have realized substantial cost savings. According to Greg Walter, Master Brewer/Facility Manager of Leinenkugel's, these savings are significant. “Instead of costing roughly \$3,000 to pitch yeast, it now only costs a few hundred dollars per batch,” said Greg.

He added, “The ‘007’ yeast is so thick and viscous that if we didn’t have the Alfa Laval mixer, we simply couldn’t drain the yeast propagation tank properly.” While the benefits of homogeneous mixing and temperature control play a key role in the Big Eddy series’ production, Greg sums up why it all matters: “We’re most proud of the fact that the Big Eddy series incorporates the most and highest quality of ingredients, and is really the most valuable craft beer in the entire Leinenkugel family of beers.” Alfa Laval is proud to play a small but important part in their brewing success!