

Rotary Jet Mixing Technology in Brewery Fermentation

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Potential

- Reduce fermentation time by 15 to 45%, increasing the installed capacity of existing fermenters
- Improve utilization of existing fermentation tank farms
- Improve quality parameters (e.g. viability of yeast crop)
- Faster homogenization of rheologically-complex, high-viscosity yeast slurries, even in large tanks
- Use of large propagators

Experience - Permanent Installations

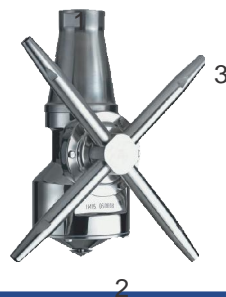
- Carlsberg DK cut fermentation time by 1-2 days, and reduced cooling from 24-36 to 12 hours; Royal Unibrew saw up to 40% faster fermentation for stronger beer types
- Carlsberg UK increased capacity by 44%
- SABMiller increased capacity at several breweries (>30 installations)
- Carlsberg UK improved yeast viability by 4%
- SABMiller reports lower acetaldehyde & SO₂ concentrations
- Royal Unibrew reported homogenous yeast slurry and improved microbiological quality in yeast storage tanks

Mixing in the Brewing Process

Mixers are widely used in areas requiring:

- Gas dispersion during yeast propagation
- Homogenization during yeast slurry production

Principal components of the Iso-Mix rotary jet mixer
Pipe feed connection (1), self-cleaning rotating housing assembly (2) and jet nozzles (3).

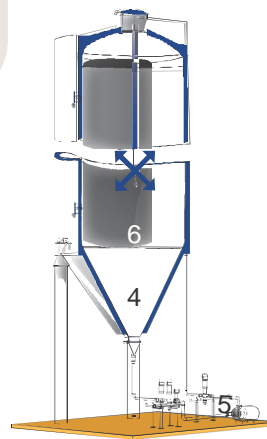


However, forced mixing is not prevalent in fermentation, despite evidence that:

- Yeast is not homogeneously distributed during most of the fermentation process
- Moderately flocculent lager strains settle after just 60% wort attenuation

Iso-Mix Rotary Jet Mixer

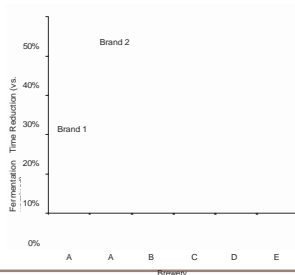
- Multiple rotating liquid jets
More effective mixing vis-à-vis standard pump loop recirculation
- Facilitates liquid, solid or gas feed into the recirculation loop
- One unit for mixing and CIP



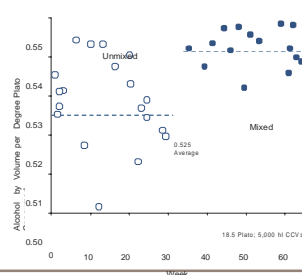
Mixing in fermentation vessel using rotary jet mixing

Liquid from the tank bottom (4) is circulated by an external pump (5) and re-injected through a multi-nozzle rotary mixer (6).

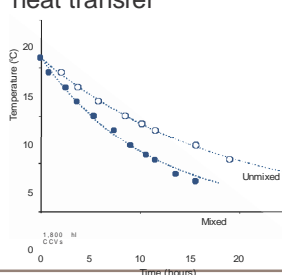
Faster fermentation process times



Higher ethanol yield at mixed conditions



Faster cooling through increased convective heat transfer



Consistent and better extract utilization

