**Rotating Jet Mixing Technology in Brewery Fermentation**

**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% (equivalent to 13 billion 33 cl cans/year)
- 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

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

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

**Impact of Mixing with Iso-Mix on Fermentation**

**Faster fermentation process times**

**Higher ethanol yield at mixed conditions**

**Faster cooling through increased convective heat transfer**

**Consistent and better extract utilization**