


EKATO COMBIJET®

A new highly effective impeller
for bioreactors and gas-liquid reactors

EKATO RMT

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Advanced Process Solutions

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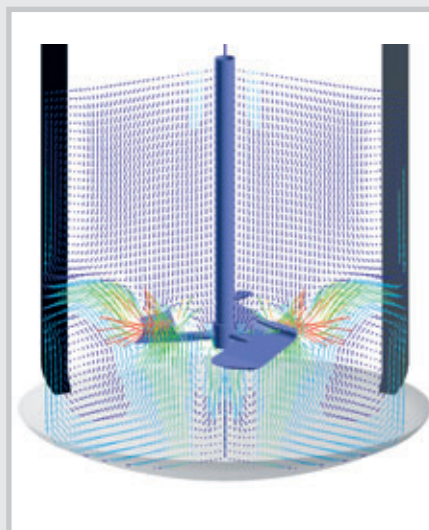
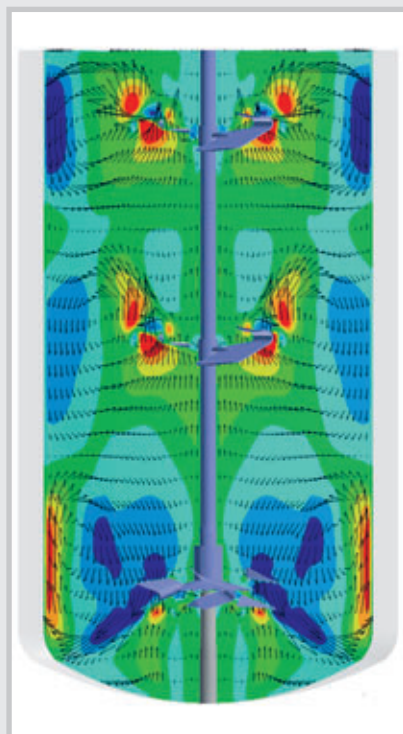
The patented EKATO COMBIJET is based on the proprietary EKATO PHASEJET and ISOJET »B« impellers. Its special blade shape creates strong radial and axial flows that lead to good gas dispersion and intensive bulk mixing of the fluid. At the same time the formation of gas pockets behind the blades is prevented thus ensuring a stable performance across a wide range of operating conditions.



Features

- Strong radial and axial flows provide excellent gas dispersion and bulk blending performance
- In combination with the EKATO PHASEJET as primary gas disperser: optimized agitation for a wide variety of gas-liquid dispersions including coalescent systems
- No marked reduction of absorbed power during gassed operation
- Cost-effective agitator due to running at a fixed speed in ungassed and gassed conditions

The objective of the EKATO COMBIJET is to provide an optimal combination of performance characteristics for gas-liquid applications. Development was based on EKATO's in-depth knowledge of gas-liquid dispersion technology and process design using existing impellers such as the ISOJET »B« wide blade impeller and the PHASEJET gas dispersion impeller as well as on extensive studies of fluid mechanics using standard measurement techniques and CFD simulations.



Strong radial and axial flows

Flow patterns in a fermenter using PHASEJET and COMBIJET impellers

The Task

Gas dispersion and bulk blending in a large bioreactor are traditionally achieved by using Rushton turbines or axial flow impellers. However, the contents are noticeably not as thoroughly mixed as desired and mass transfer of oxygen into the media is significantly lower than expected at high air flows. The agitator power drops dramatically. In order to reduce the mass transfer problem a frequency inverter must be installed and agitator speed adjustments have to be made during the fermentation process.

The Solution

By using EKATO COMBIJET impellers and a PHASEJET as primary gas disperser, the performance remains stable across a wide range of process conditions. The combination of axial and radial flows and the specially shaped blades lead to a stable mass transfer performance and rapid mixing of the entire vessel contents.

A frequency inverter is only necessary if required by the process; not to compensate for the sensitivity of the agitation system.

Cost-saving advantages:

- Simplified design and improved control of the agitation system
- Frequency inverter not necessary to maintain good mass transfer performance, thus saving investment costs and improving electrical efficiency
- Better homogeneity of the fermentation medium