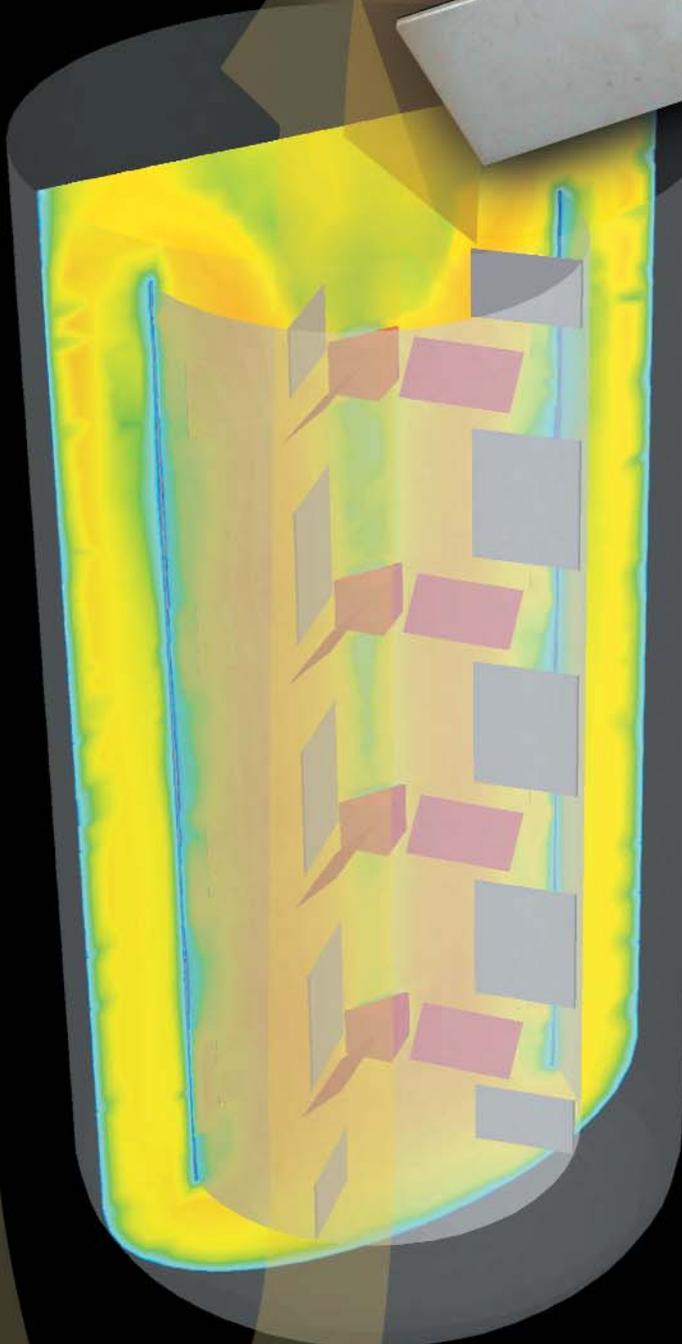




HI-FLUX™

MIXING TECHNOLOGY

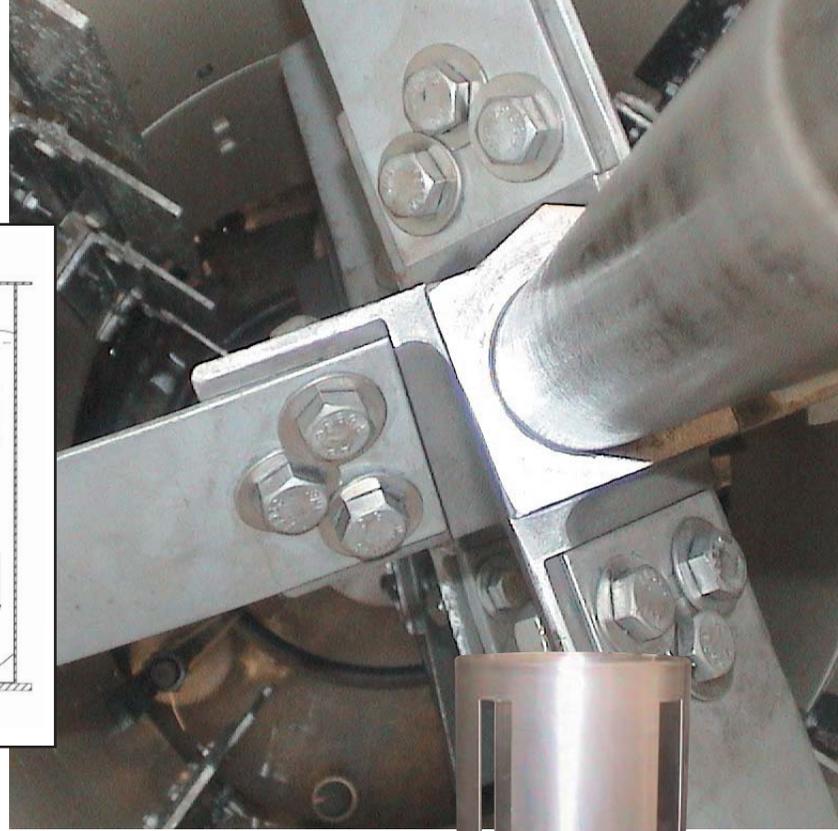
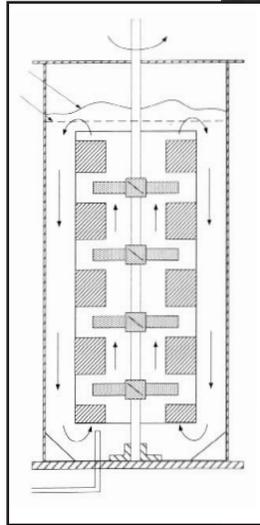
Dramatic improvement in gas-liquid,
liquid-solid, and gas-solid-liquid
mixing and mass transfer results.



- Excellent bulk & micro mixing
- Predictable flow field, reliable scale-up
- Shorter process cycle times
- Robust system for difficult, viscous fluids
- Retrofit into existing tanks

A significant advancement in industrial mixing technology

Initially developed to improve gas-liquid mass transfer in fermentation reactor systems, the HI-FLUX Mixer & Reactor Technology has been found to be highly effective in handling the most difficult single phase, two phase, and multi-phase mixing applications. A very cost efficient design for both Newtonian and non-Newtonian fluid applications, the HI-FLUX system can be retrofitted into existing tanks or reactors of any shape.



The cylindrical draft tube is mounted inside a mixing vessel with multiple up-pumping pitch blade impellers (PBTs). Internal baffles are positioned inside the draft tube, above and below the impellers, to eliminate swirl and promote axial flow, in *m²t's* patented design.

Optional slotted draft tube (shown at right).



A universal solution for the fluid processing industries



Chemical



Petrochemical



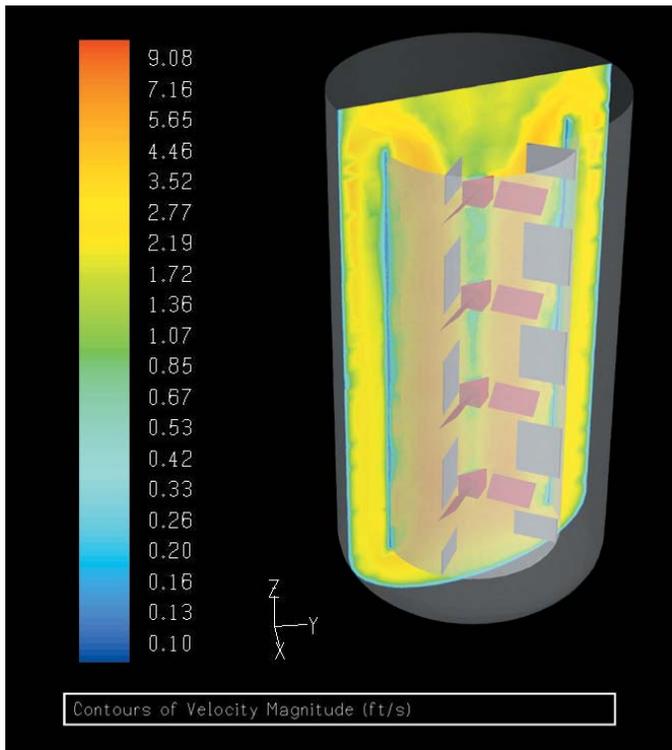
Pharmaceutical and Biotech



Food and Beverage



Minerals Processing



Produces dramatic results

- Eliminates stagnant zones, even with highly viscous shear thinning fluids.
- Produces a predictable, well-defined flow field at all scales and is easily scalable – from pilot plant units to large production systems.
- Provides high rates of gas-liquid and liquid-solid mass transfer.
- Reduces bulk blend times with rapid micro mixing, while greatly enhancing heat transfer.
- Versatile to handle many challenges as a multi-product, multi-purpose mixing system.
- Can be operated at varying tank liquid levels with its slotted draft tube design option.

Simplicity of design

By using standard PBT, or axial flow impellers, combined with straight-forward draft tubes, mixer shafts and standard mixer drives, HI-FLUX Mixers and Reactors also provide cost effective mixing solutions:

- Installed as a new mixing system it reduces capital costs with savings in motor and gearbox selections, with as much as a 40% decrease in power needs (compared to conventional stirred tank reactors).
- Retrofitted into existing mixing vessels or reactors to improve gas-liquid mass transfer by up to 100% in high viscosity service (versus conventional agitators) at equal power input, with shortened mixing times – up to 50%.
- Higher Oxygen transfer capability compared to non-agitated reactor designs (bubble column or airlift).

Superior mixing at any liquid level

In conventional designs, a draft tube device must be completely submerged in order to provide flow through it and around, through the annular space. **m²t Technologies** patented HI-FLUX design features slotted or perforated openings in an optional draft tube configuration to permit flow at any liquid level in the tank. These “slots” enable up to 40% cross flow through the wall of the draft tube. Slot design can be modified to match any mixing requirement.

Design benefits

- Mechanically stable even in intense gas-liquid reactions.
- Can be custom designed for difficult mixing challenges including shear sensitive materials, and rheologically complex fluids to mitigate heat transfer problems that can affect mixing results.
- No need for exotic sparge designs in gassed applications - single pipe spargers provide desired results.

Mixing & Mass Transfer Technologies, LLC

Dedicated to solving your most difficult fluid mixing and mass transfer problems.

m²t is a research-intensive company with a rapidly expanding list of patented technological developments in Industrial Mixing and gas-liquid-solid multiphase reactors for Newtonian and shear thinning fluids. We also are a leader in water and wastewater treatment applications with the well-known Lotepro Environmental System and Services group serving industrial and municipal customers.

Whether you wish to quickly solve an existing mixing, mass transfer or heat transfer problem, or want to develop technology for a near term application, we can provide you with the breadth and depth of support. Our staff has been solving these problems for years in the chemical, food processing, wastewater and water treatment, pharmaceutical, petrochemical, and fermentation industries. We're experts at liquid-liquid, liquid-gas, and liquid-solid mixing, as well as wastewater treatment. Customers often involve us at an early stage of their technology implementation or development cycle, getting the full benefit of our Chemical Engineering, Mixing and Reactor Design expertise.

Our Technology Center is designed to work with you

Our R&D center is located in State College, PA. We support our customers with a talented staff and a broad spectrum of equipment configurations and vessel sizes to conduct mixing studies, including mass transfer and scale up analyses, with mixing equipment ranging from 10 to 1000 gallon scale tanks. The tanks have transparent walls to facilitate visual observations of mixing and multiphase contacting behavior.

m²t provides effective mass transfer and mixing models to take the guesswork out of process scale-up. We are highly proficient in the use of advanced Computational Fluid Dynamics (CFD) to model and gain the insight necessary to solve reactor design and mixing problems. Through a combination of our real world experience, mathematical modeling expertise, CFD capabilities and our R&D test facilities, we can analyze your mixing challenges and provide you with quick technology solutions.

m²t Technologies is rapidly becoming THE place to conduct "cutting edge" fluid mixing, mass transfer, and reactor design research.

For more information:



Mixing & Mass Transfer Technologies, LLC
P.O. Box 315 • State College, PA 16804

Tel: 410-216-9233
Tel: 888-715-9600
info@m2ttech.com
www.m2ttech.com