

FluidMaster

for a better understandig of mixing processes

Non-intrusive laser based measurement systems for the quantitative visualization of mixing processes in liquids. Laser Induced Fluorescence (LIF) techniques are applied using laser light sheet illumination. Instantaneous concentration maps of the mixing species are measured with high temporal and spatial resolution. Monitoring of reactive mixing is possible using reaction sensitive fluorescence probe molecules.

Information



LIF image of turbulent mixing

instantaneous digital concentration fields

with statistics (mean and rms values)

- visualization of large and small scale mixing structures
- degree of mixing
- reactive mixing: reactant and product visualization
- flow field velocity

FluidMaster can be specially configured for

- high resolution imaging of the mixing process
- high speed imaging to study process dynamics
- monitoring of reactive mixing processes
- microscopic imaging of small scale mixing structures
 - wavelength tuning capabilities for a wider range of tracers



Features

non-intrusive and fast on-line mapping of concentration fields

- high spatial resolution (more than 1.3 million measurement points)
- high performance, photometric CCD imaging systems
- high speed image recording up to 10 kHz
- light sheet and image correction, intensity calibration
- movie presentation of transient mixing processes

Upgrade

3-dimensional concentration fields using light sheet scanning

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Focus on liquid mixing processes	FluidMaster (laser) light sheet imaging systems are designed for the quantitative visualization of liquid mixing processes in stirred vessels, reactors or jet-mixers widely used in the chemical and pharmaceutical industries.
	Experimental data of the 3-dimensional and often turbulent mixing processes are required to develop appropriate CFD-codes and, finally, for the optimum design of mixing devices.
Operating principles	Laser Induced Fluorescence (LIF) is applied using (laser) light sheet illumination slicing the liquid flow field at user-defined locations. A fluorescence tracer is used to label one or two of the mixing species. The camera system measures the LIF-signal which is proportional to the tracer concentration. Concentration fields are converted in realtime into meaningful data for mixing process characterization. Mixing structures and their fluctuations in space and time are recorded. The temporal evolution as well as time integrated data of the mixing process can be measured. Light sheet scanning methods can be applied for 3-dimensional measurements.
System components	The system consists of an appropriate (cw or pulsed) light source with light sheet projector for light sheet illumination, a photometric CCD camera system, imaging optics with filters, PC with interface cards and the FluidMaster image acquisition, data processing and visualization software.
Customized solutions	Customized systems are offered for application-specific measurements.



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