

Micro PIV Systems

Microvec Micro PIV Systems are easy to integrate and to operate. Designed for research and for universities, they work with small fields of view (100 μ m to 10mm), with micron scale spatial resolution and different flow speeds. They can also be used to acquire images with a high speed of over a thousand frames per second. Micro PIV can work with MACRO lenses, long distance microscopic lenses or they can be integrated with epi-fluorescent microscopes.

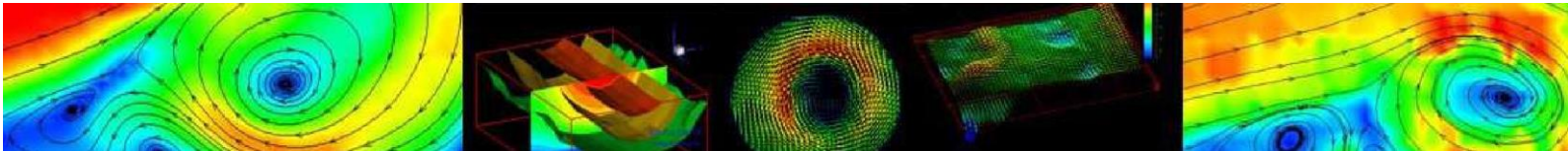


System Overview:

The Micro PIV System measures velocity fields of flows with microscopic resolutions using PIV and LIF techniques. The light source is usually a double pulsed PIV laser that is focused on a microfluidic device using a microscopic lens or microscope. For PIV, the flow is seeded with fluorescent tracer particles. A camera is also installed on the microscope to acquire image pairs. Because Micro PIV deals with microscopic dimensions, and the laser light sheet is often the same size or bigger than the area under observation, the light floods the microchannel and illuminates all the particles in the illuminated volume. That is why we use fluorescent particles and illuminate only a fraction of them to obtain good results. Additionally, we add the high pass filter or use Epi-fluorescent cubes in the microscope.

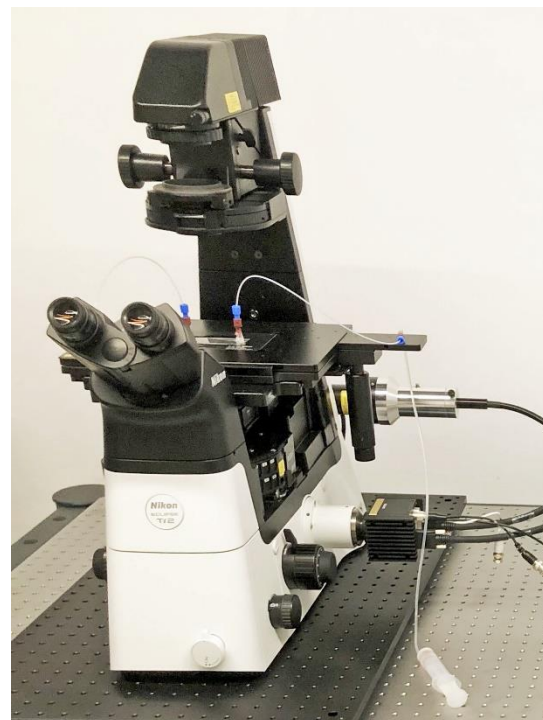
Microvec uses liquid fibre guides for the input of pulse energy of up to 60 mJ per pulse or a laser guiding arm for higher energies, to connect the laser to the microscope. To connect the laser to the microscope, Microvec designed the appropriate adapters and couplers for both ends. For the use of the liquid guide, a collimating lens is built-in to reduce the divergence of the outgoing light. The adapter is adjustable to make it possible to control the divergence angle. To ensure the safe delivery of laser light into the microscope, the optical fibre is protected with crimped stainless steel. The collimated liquid light guide then attaches to the epi-fluorescent illumination tube adaptor on the microscope to deliver the light to the experiment area. Microvec supports Nikon, Olympus, Leica and Zeiss microscopes.





Standard Components:

- Double pulse PIV lasers: 60mJ x 2/25Hz, 120mJ x 2/20Hz, 200mJ x 2/15Hz, 50mJ x 2/50Hz
- DPSS lasers: 1W, 2W, 5W, 10W
- CCD cameras, including all interface cables and camera frame grabbers: VGA/260fps, 1MP/148fps, 2 MP/30fps, 2.8 MP/54fps, 4MP/41fps, 5MP/16fps, 6MP/25fps, 8MP/21fps, 9MP/17fps or 29MP/4fps
- Synchronizer: MicroPulse 825
- MicroCap PIV Image Capture Module & Microvec 2D High-Precision PIV Software Package
- 5x MACRO lens, long-distance microscopic lens or scientific microscope with an Epifluorescent filter cube
- Laser guiding arm or fibre optic liquid guide with adapters and couplers to connect the laser to the microscope
- Fluorescent particles
- High pass filters for the MACRO lens or long-distance microscopic lens



Applications:

- Microfluidic Devices
- Liquid Jets/Nozzles
- Microscale Deformations and Strains
- Two-phase flows in microsystems
- Biological flows
- Hemodynamics Particle Analysis
- Micro Channels
- MEMS applications
- Lab-on-a-chip devices

