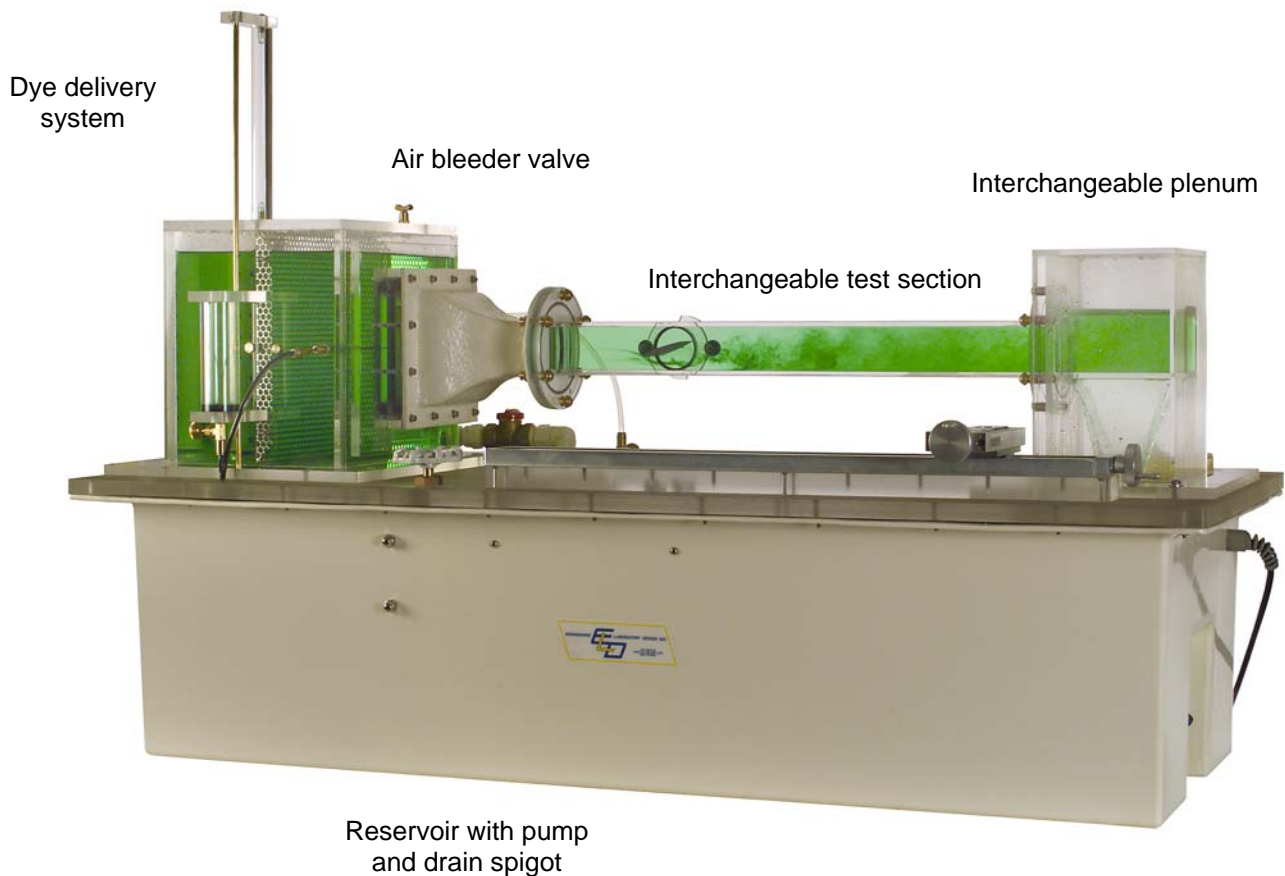
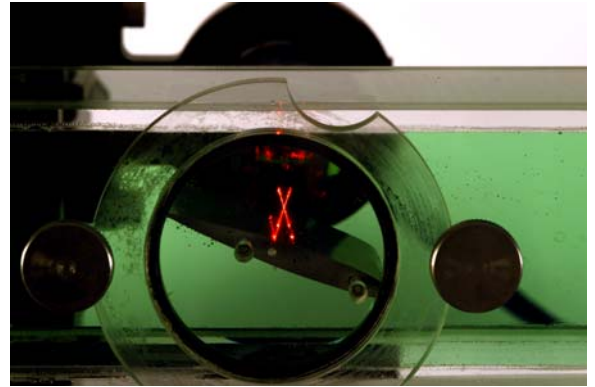


# flowLab™

## A Miniature Water Tunnel and miniLDV™ Package

The *flowLab Facility* provides educators with a ready-to-run package to demonstrate basic fluid mechanics concepts through modern measurement techniques that have real-world applications. It includes the flowLab water tunnel (shown below) with various test section options and a *miniLDV System* (including probe, 3D traverse, and software) research-grade measurement system. The entire facility measures 52 inches (1320 mm) wide, 22 inches (560 mm) deep, and 35 inches (890 mm) tall (including the gravity-fed dye delivery system). Flow comes from a sump pump integrated into the 35-gallon (133-liter) reservoir tub. Even full of water, the facility is small enough to sit on a sturdy workbench or desk.

The standard manually-actuated traverse system allows the miniLDV probe to be positioned anywhere within the test section. Optionally, motorized traverses, interfaced with the software, can be added to allow for automatic acquisition of profiles (like those shown on the next page).



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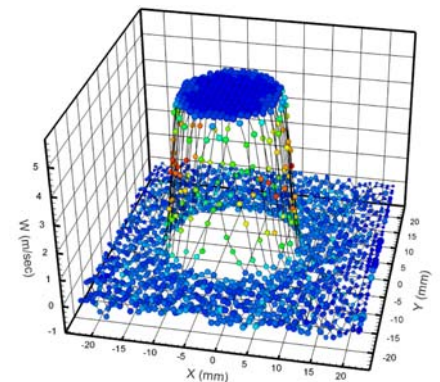
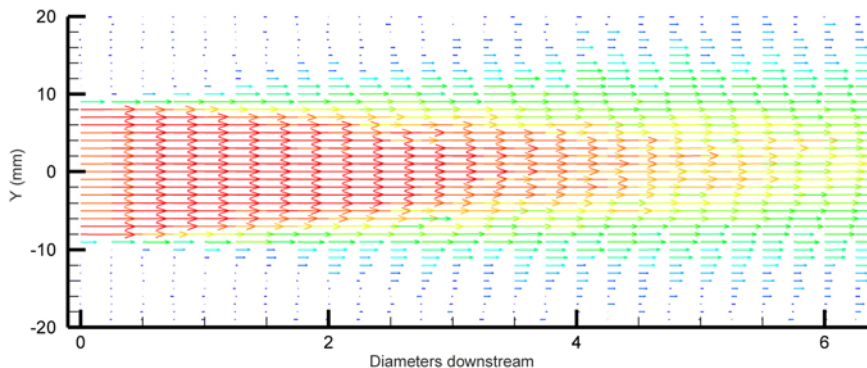
# flowLab™

## A Miniature Water Tunnel and miniLDV™ Package

### A Modular Flow Facility

The flowLab was designed with versatility in mind. Both the test section and the plenum are interchangeable. The test sections are 2 by 2 inches (50 by 50 mm) in cross section and 24 inches (610 mm) long and can be changed in a few minutes by removing 12 screws. Several configurations are available: a standard section with a model-mounting plug (a blank plug, a plug with a cylinder, and one with an airfoil), a section with a built-in turbulent jet, a section with a flat plate, a circular pipe section, and a section for hydraulic jump studies. The standard plenum is a Wier arrangement which allows optical access upstream, but a free plenum is also available (and required for the hydraulic jump test section).

Flow is generated by a 1/3-hp sump pump (running off a standard 110V AC outlet) inside the tunnels' reservoir tub and can provide up to 40 gallons per minute (150 liters per minute) of flow—corresponding to 39 inches per second (1 m/sec) in the free test sections and up to 16.4 feet per second (5 m/sec) at the exit of the jet test section. The flow speed is adjusted via a mechanical valve. The tunnel also includes a gravity-feed dye delivery system for visualization. A standard spigot with a male thread allows easy draining of the reservoir via a standard garden hose.



Coupled with a traversing miniLDV System, the flowLab Facility provides a complete system for education and small-scale studies that is quick to run and doesn't occupy too much space. Measurements can be made that rival those of PIV systems—without the hassle of refracting prisms, calibration targets, and laser sheet alignment. The measurement on the left is the velocity magnitude at the midplane of the turbulent jet test section (with the color of the vector denoting magnitude); the one on the right is the out-of-plane velocity component through the exit of the jet (with the color of the points denoting the turbulent intensity). Measurements like these can be performed in less than four hours from setup to plot.



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