GBW Associates, LLC
Westminster, MD

WSI LLC
Water Supply Innovations LLC

Floating Strainer
Flow Test Results Briefing

September 30, 2017

On September 30, 2017, the folks from GBW Associates, LLC and Water Supply Innovations, LLC conducted a number of flow tests on 30 different makes, models, and styles of 6-inch, fire department suction strainers. The results from the floating strainer performance tests are presented in this document.

All testing was done at the Hunterdon County Emergency Services Training Center in Annandale, New Jersey. Engine 1262 from the Glen Gardner Fire Company was used for each flow test. The pumper was equipped with a Hale QMax 2,250 gpm single-stage pump powered by a 515 hp diesel motor.

The Test Conditions

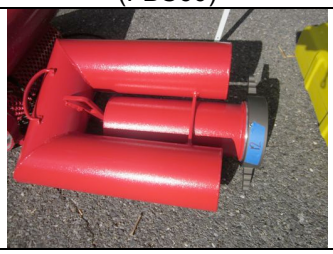
All test conditions were kept constant from flow test to flow test:

- 20-feet of 6-inch Kochek lightweight suction hose;
- 3.52-feet of lift;
- 371-feet test site elevation;
- Air temperature between 60 ^{0}F and 69 ^{0}F;
- Water temperature between 60 ^{0}F and 70 ^{0}F;
- 50-feet of 4-inch hose from the pump's high-flow discharge supplying a 2-1/2-inch Hose Monster; and,
- Dual, 3-inch hoses, each 50-feet in length, each connected to a 2-1/2-inch discharge, and each supplying a portable monitor outfitted with an Akron Flow Test Kit and 1-3/4-inch smooth bore tip.
- All strainers tested, except the floating strainers and the ice strainer, were tested at a depth of 25-inches below the water's surface.
- The same person operated the fire pump.
- The same person oversaw pump operations and suction strainer deployment.
- The same person collected all physical data on each suction strainer.
- The same person recorded all gauge readings.

The only variable in the entire flow testing process was the suction strainer being tested.

Prior to the first suction strainer flow test, a flow test was completed using no strainer on the suction hose. This test provided a baseline for comparison of all strainers: as strainers were added to the end of the suction hose, a restriction in flow was expected. For each flow test, data was recorded at peak output flow, which in most cases was also the point at which pump cavitation began.

The Floating Strainers

		
Kochek Big Water (FBS602)	Kochek (FBS60)	Fol-Da-Tank Float Dock (FDS6)
		
Ziamatic (FDS-600-NST)	Harrington (HTFBS-60NHLH)	Kochek (Original model)
		
	Task Force Tips (A03HNX-JET-F)	

Floating Strainer Flow Test Results

Device	Flow Achieved (gpm)	Motor Speed (rpm)	Vacuum Reading ("Hg)
No strainer (Baseline Test)*	1800 gpm	1225 rpm	17.0 in
Kochek Big Water (FBS602)	1864 gpm	1200 rpm	15.0 in
Kochek (FBS60)	1743 gpm	1150 rpm	17.0 in
Fol-Da-Tank Float Dock (FDS6)	1800 gpm	1150 rpm	16.5 in
Ziamatic (FDS-600-NST)	1800 gpm	1150 rpm	16.5 in
Harrington (HTFBS-60NHLH)	1699 gpm	1075 rpm	18.0 in
Kochek (original model)	1723 gpm	1100 rpm	18.0 in
Task Force Tips (A03HNX-JET-F)	1762 gpm	1100 rpm	16.0 in

General Notes About the Flow Tests

- The baseline flow test measured maximum flow without the use of a suction strainer.
- All flow readings were obtained using remote test gauges connected to a 2-1/2" HoseMonster flow diffuser and to an Akron Flow Test Kit on a portable deluge gun outfitted with a 1-3/4-inch smooth bore nozzle.
- Motor speed readings were obtained using the digital tachometer on the pumper's pump panel.
- Vacuum readings were obtained using a remote test gauge connected to the pump's vacuum test port.
- All test gauges were either new or recently calibrated. All test gauges were also field verified the morning of the flow tests. Therefore, all flow readings are expected to have a 5% or less margin of error.

The Findings

All of the floating suction strainers performed well - with the Fol-Da-Tank Float Dock Strainer, Ziamatic Floating Strainer, and the Kochek Big Water Self-Leveling Strainer performing the best at 1800+ gpm. Of note, the two strainers that produced the highest vacuum readings also performed the lowest in terms of flow ability. Finally, the Harrington strainer proved a bit problematic during the testing in that a vortex kept trying to form to the extent that the strainer had to be pushed below the surface of the water using a pike pole in order for the strainer to achieve peak flow. Thus we would expect a lower flow from the Harrington strainer in real life when no one is available to push and hold the floating strainer below the water's surface.

Many thanks to all of the folks and fire departments that contributed time, equipment, and funds in support of this project. A complete listing can be found in the project's "official" white paper.

Questions or concerns about the flow test results can be directed to Mark E. Davis, CFPS at www.gotbigwater.com by emailing thebigcamel@gotbigwater.com or by joining the Members Area of www.GotBigWater.com.