



Standard Operating Procedure Optimice® Static Pressure Requirements Conclusion

Objective

This analysis measured the static pressure necessary to ventilate the Animal Care Systems Optimice rack at recommended flow rates.

Construction

A high-sensitivity differential pressure sensor was placed between two modified Valterra clear-view adapters in a configuration that provided pressure data for both hoses connected to the rack. An 8-inch centrifugal fan supplied airflow through a long intermediate duct equipped with a second pressure sensor and hot-wire anemometer probe; the duct represented a typical extremity leg of a building’s exhaust system and enabled accurate measurement of total airflow and pressure load imposed on the exhaust system at the room level. For detailed information on the construction of the apparatuses and equipment used, refer to the full test report.

Procedure

The Optimice rack was connected using standard 6-foot exhaust hoses to one end of the intermediate duct, and the fan was connected to the other. The sensor-equipped adapters were installed in line with the flow at the rack-to-hose connections, one adapter per hose. Dampers were used to modulate flow at the fan side of the intermediate duct.

The fan was switched on, and the damper setting was adjusted to a predetermined minimum position. At each flow setting, static pressure and linear velocity data measurements were taken from the pressure sensors and hot-wire anemometer. Each measurement occurred after 20- to 25-second data stabilization period.

The data was analyzed statistically to determine average pressure and uncertainty at each discrete flow rate.

Data

All airflow values refer to flow rate per exhaust hose and are expressed in cubic feet per minute; double the values to get total airflow. All pressure values are expressed in inches of water.

Optimice Flat Filter Pressure Results								
Airspeed, ft/min (m/s)		48 (0.24)	86 (0.43)	115 (0.58)	137 (0.7)	170 (0.86)	198 (1)	210 (1.06)
Airflow, CFM (L/min)		16.8 (475)	30.1 (852)	40.2 (1138)	48 (1359)	59.5 (1684)	69.3 (1962)	73.5 (2081)
At Ceiling Drop	Average Pressure (In. H ₂ O)	-0.03245	-0.06850	-0.10416	-0.14076	-0.21894	-0.29920	-0.34046
	Standard Deviation	0.00268	0.00296	0.00332	0.00443	0.00567	0.00782	0.00841
At Rack	Average Pressure (In. H ₂ O)	-0.01779	-0.03197	-0.04511	-0.05808	-0.08419	-0.11071	-0.12314
	Standard Deviation	0.00117	0.00123	0.00132	0.00159	0.00241	0.00294	0.00272

