

Measuring Airflow in the Clean Room

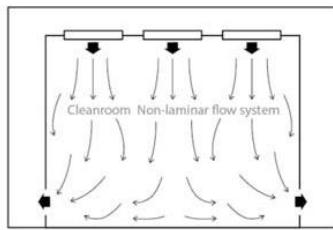
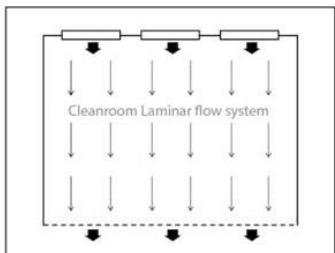


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Application Note

There are a couple ways to setup a ventilation system for a clean room or controlled environment, but regardless of which system is used the purpose is the same: to remove contaminates so the environment stays controlled. However, the methods used to check that the airflow is correct vary depending on the ventilation setup. For the purpose of this article we will look at the two most common ventilation setups.

The first is called a laminar flow system. In this setup air flows through the clean room in one direction, either horizontal flow or top to bottom. To confirm that the system is working properly it is necessary to check the airflow at the supply vents and also to check the distribution of airflow throughout the room.



Examples of Cleanroom flow system

At the supply vents or fan filters the volumetric flow should be checked by using the following formula: $Q = V \times A$ where "V" is the average or center air velocity and "A" is the area of the vent or fan filter. To determine the total volumetric flow for the room the procedure should be repeated at each vent or fan filter and then summed. This number should then be compared to the specifications for the clean room to find if it is in tolerance. Many modern anemometers come with this calculation function built in.

It is also necessary to check the flow of the air throughout the room to make sure it is in fact flowing in a laminar fashion and is flowing at the desired speed (again, this number should be specified in the design specifications for the room).



The second common type of ventilation system is non-laminar or turbulent airflow. In this case the room is designed to dilute and remove contaminates based on a certain # of air exchange rates per hour. To check this type of system you would measure the airflow at both the supply and the returns and then calculate the number of air exchanges that occur per hour (as noted in the design specifications for the room).



Handheld Thermal Anemometer



A number of tools are available to help with these measurements. Thermal or vane-type anemometers as well as capture hoods can be used. However if the flow rate in the clean room is low (usually 0.2 to 0.5 m/s) it is best to perform these measurements with an anemometer due to the limitations of technology for airflow capture hoods.



Airflow Capture Hood

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Kanomax has delivered the best measurement solutions in its products and services that adapt precision measurement technology for fluids and particles. Kanomax product lines include anemometers, particle counters, dust monitors, and IAQ monitors. Kanomax is contributing to technological innovation and quality improvement for the processes of quality management, environment management, and technology development in the areas of environment, health , and energy, which are essential to sustain human well-being, as well as in other industrial areas including automobile, aerospace, semiconductor, electronics manufacture, heavy industry, steel, shipbuilding, pharmaceutical, biotechnology, food-processing, medical, construction, and civil engineering.



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