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## Fume Hood Performance Hinges on Supply

In this era of heightening workplace health and safety concerns, the need for reliable fume hoods that constantly deliver high containment in real world conditions is greater than ever. One of the biggest contributors to poor fume hood performance is supply air grille type and location. Many times, we receive calls from job sites about a fume hood with performance problems. Sometimes the alarm cannot be calibrated or the face velocity variation is substantial and the hood cannot be certified. After a brief conversation, it is discovered another brand new laboratory has a poorly designed supply air system. Most ventilation engineers have a clear understanding of the exhaust volume requirements and normally the problem is not an issue of the quantity of supply air, but rather the velocity and location of the supply air.

**Locate grilles as far away as possible.** The key concept is to locate the grilles far away from the fume hood face to minimize the air turbulence near the fume hood. In addition to reducing turbulence in front of the hood, the air moving through the entire length of the lab from supply air grille to fume hood will tend to sweep the lab of contamination. Some engineers who do not specialize in laboratories seem to have the impression that since the fume hood is where the air is going, that it should be supplied immediately in front of the fume hood. When combined with high velocity grilles designed for offices, this can lead to extremely poor fume hood containment.



**An example of the low velocity radial diffuser**

**All grilles are not created equal.** Special types of supply air grilles are available for laboratory use. Known as *Radial diffusers*, these are normally larger than standard office grilles and feature a surface of fine perforations. There are a number of companies that manufacture these grilles. Some of these manufacturers have the capability to perform extensive testing in simulated laboratory conditions to ensure performance in the real world.

**More IS better.** Most guidelines state that the terminal velocity of supply air should be one third to one half of the face velocity of the fume hood. This means that supply air grille area should be at least double that of the fume hood face area. A good rule of thumb is that a standard six foot hood should have a minimum of two supply air grilles, each measuring two by four feet. As the grilles are placed further away from the fume hood, the real requirement is not as stringent. High velocity, office type grilles can be used successfully when they are located 20 to 30 feet away from any fume hoods. But since air is always flowing into the laboratory, heated or cooled, this can cause discomfort to those working near the grille. Although the effect of supply air grille location has been studied and papers have been published, engineers and contractors continue to make mistakes in the selection and location of supply air grilles in laboratories.

About the author: Andrew Sinnamon has been involved in fume hood design, development and testing for 18 years as Mott Manufacturing's Fume Hood Specialist. He is a Mechanical Engineering Technologist and a full member of ASHRAE. Mr. Sinnamon has served with the Canadian Standards Association on the Fume Hood committee. For more information on this or other fume hood questions please contact Andrew at ext. 234 or by email at [asinnamon@mott.ca](mailto:asinnamon@mott.ca).

## Custom BSL4 Casework

BSL-4 laboratories are highly demanding environments. Mott has designed customized stainless steel casework and furniture to meet these demands. Our BSL-4 casework and furniture has coved corners, edges that are rounded, is completely seamless, crevice free and made of a heavy gauge stainless steel. Mott recently supplied tables and cabinets for the National Institutes of Allergy and Infectious Diseases (NIAD) in Maryland. For information on these products, please contact our Sales Manager, Mario Di Fonte at [mdifonte@mott.ca](mailto:mdifonte@mott.ca) or call extension 218.



## New Catalog At Mott

The new Mott catalog version 5.0 is now available and we have included new sections for the Optima™ Laboratory Bench System and Sigma Fusion™. We have expanded our product offering in almost all sections of our catalog including ADA height cabinets with related fillers, new base cabinets, and more. To receive a copy of our catalog please email Jenn Dolan at [jdolan@mott.ca](mailto:jdolan@mott.ca).



**An example of the worst type of grill and bad location**