

## **Low Flow / Low Velocity Fume Hood**

### **What is a low flow or low velocity hood?**

The terms “low flow / low velocity” are often confused. These terms are best defined in the 2006 SEFA desk reference (second edition) page 81. A low flow hood is one that has had the exhaust volume reduced by operating through a smaller sash opening. This type of hood does not require the containment be the same with the sash full open for setup as it is for usage. Energy savings can parallel that of low velocity hoods, but proper sash position for usage or setup must be managed.

A low velocity hood also achieves energy savings by reducing the operating sash opening and corresponding exhaust volume. A low velocity hood differs from a low flow hood by retaining proper capture (4.0AI0.10) when the sash is raised for setup and the face velocity drops as low as 60 fpm.

### **What is a high performance hood?**

A high performance hood is basically the same as a low velocity. The term “high performance” is freely used by various hood manufacturers as a marketing strategy.

Technically, to place hoods in the high performance category the product should excel in all aspects of hood quality and performance including better containment, improved ergonomics, additional safety features and high corrosion-resistant aspects. It should also be maintenance free. High performance hoods should provide minimum containment levels (4.0AM0.05), have higher sight lines (approximately 35") and flush airfoil sills. A secondary spill trough below the sill enhances safety. The liner should be constructed of non-metallic materials to minimize corrosion, and counterbalance systems should be of premium quality chain and sprocket type construction to provide life cycles in excess of 250,000 cycles of use. The Hamilton Concept and Pioneer are excellent examples of hoods that meet all of these criteria.

### **What is the minimum recommended face velocity through the operating opening?**

All recommendations or standards in print recommend a face velocity of 60 fpm or more and include the following:

- ANSI/AIHA Z9.5
- NFPA 45
- OSHA 29CFR 1910
- SEFA
- ACGIH Industrial Ventilation Manual

## **Hamilton Laboratory Solutions**

Low Flow / Low Velocity Fume Hood

Page 2

### **Why are low velocity hoods deeper?**

All low velocity hoods are not necessarily deeper. For example, the Hamilton Concept is designed for a standard 30" deep top and is only 31¼" deep overall. Constructing a hood deeper is an uncomplicated way of achieving improved performance. Moving the baffle which is at the rear of the hood – farther from the face of the hood – provides more room for the airflow to stabilize and even out.

### **What is the most important safety feature of the fume hood?**

The sash is the most important safety feature. Any hood will provide excellent containment if the sash is positioned to provide face and upper body protection. Also available are sash designs that passively lower the sash to further promote the proper use and benefits of physical sash protection.

### **Will the use of a low velocity hood offset the adverse effects of ceiling supply air diffusers?**

Better designed hoods will help offset the impact of poorly designed room supply air systems, but low velocity hoods cannot be expected to solve all possible problems. Room supply diffusers must be located, sized and managed to minimize the drafts in front of the hoods.

### **Is there recommendation or any quick “rule of thumb” to follow on acceptable draft levels in front of hoods?**

The 2006 version of ASHRAE 110 recommends that room drafts in front of hoods be controlled to no more than 30 fpm. The most challenging draft is a backdraft around the operator’s body. General rules to follow when designing the room supply include the following:

- Locate the diffuser at least 4' from the hood.
- Utilize 2 x 4' diffusers. (Do NOT utilize 2 x 2' diffusers.)
- Provide no more than 400 cfm through the diffusers near the hoods.

### **Helpful Abbreviations**

ANSI/AIHA - *American National Standards Institute / American Industrial Hygiene Association*

NFPA - *National Fire Protection Agency*

OSHA - *Occupational Safety and Health Administration*

SEFA - *Scientific Equipment and Furniture Association*

ACGIH - *American Conference of Governmental Industrial Hygienists*

ASHRAE - *American Society of Heating, Refrigerating and Air-Conditioning Engineers*