

## Location, Location, Location

### ***A fume hood is only as good as its location—learn the secrets for proper positioning***

In order for any fume extraction hood to be effective, proper positioning by the operator is mandatory. A hood must be positioned such that the fumes will be drawn away from the worker's breathing zone. Distance from the source and position relative to the source are both equally important in determining the best location of the exhaust hood.

#### **Factors Affecting Positioning**

When using an air exhaust hood, air is drawn into the hood from all directions. Air velocity decreases rapidly as you move farther away from the mouth of the hood. The optimum distance the hood should be positioned from the work is variable due to specific conditions such as movement of air in the room, the amount of airflow through the extractor and the design of the hood.

##### *1. Movement of Air*

Often overlooked, the natural movement of air within a facility can affect the placement of a hood. Recommendations for placement assume a neutral or minimal velocity of ambient air. However, if the worker can feel a draft from the building HVAC or natural convection, the fumes will travel with the building's air current, and the fume hood may require adjustment for proper operation.

##### *2. Airflow through the Extractor*

A common misconception in the manufacturing industry is that air volumes in excess of 1000 cfm for each hood are needed to obtain proper fume extraction. This practice results in increased heating and cooling loads for the



Poised for duty: a fume hood patiently awaits the opening of a reactor vessel containing hazardous materials.

plant as well as the costs associated with buying and operating larger fans.

In practice, 600-700 cfm per hood is adequate for capturing contaminants thru a 6" fume arm. Careful sizing of fans and ductwork will provide adequate pressure and flow at the hoods.

#### *3. Hood Design*

Hoods are either circular or rectangular. For circular hoods, a good rule of thumb is that the hood should be placed within two hood diameters from the fume source.

Generally, rectangular hoods should be located within two lengths of the actual opening, or within one length of the flange.

#### **What about Location?**

The location of the hood generally remains the same despite differences in the type of fume or industry: somewhat above the source and opposite the worker.

#### *Welding*

Due to the heat given off by the arc, the fumes and particulate tend to rise up in a plume above the weld. In order to capture this plume of smoke, the hood should be positioned somewhat above the weld opposite the welder. This positioning allows ample room for the operator to work while protecting him or her from harmful gases.

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within two hood diameters from the fume source.”***

It is commonly recommended to achieve an air velocity in the range of 100 ft./min. across the welding zone. Higher velocities may affect the gas shielding that surrounds the weld metal.

#### *Chemical/Pharmaceutical*

Chemical fumes are generally lighter than welding smoke and are usually invisible. It is critical that the hood be in position before the possibility of a release of the fume. Hoods used in chemical or pharmaceutical applications should be positioned somewhat above the fume source (tank, reactor, or tote), and opposite the worker.

#### *Laboratories*

Hoods used in laboratory or bench-top applications are generally smaller than those used in production or welding. Smaller hoods have smaller air capacity, so proper placement is even more critical. The same guidelines apply for positioning, with the result that the hood is placed closer to the fume source. Because of the close proximity required, different hoods have been developed so that the fumes can be captured without getting in the way of the user.

#### **Conclusion**

In summary, the necessary components to achieve proper source capture of fumes are an easily positioned fume extractor with a well-designed hood, proper airflow through the fume extractor and a conscientious worker who will position the hood in a manner that will draw hazardous fumes away from his or her breathing zone.

#### **For more information**

For help in selecting your next fume extraction hood, call us at **215-364-3400**.



A ceiling-mounted extractor arm is readily accessible in a laboratory.

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