conoco

Interoffice Communication

To Distribution

From J. J. Hall

Date May 22, 1978

Subject Laboratory Hood Classification Schedule

Properly functioning laboratory hoods are an essential element in controlling exposures to chemicals in our laboratories. Face velocity in linear feet per minute is the critical parameter of hood performance. Much controversy has revolved around the search for a "magic number" suitable for all hoods under all conditions. Unfortunately such a number does not exist. There are a number of variables to be considered in selecting the proper face velocity, including:

1. Characteristics of the substance to be handled (quantities handled, toxicity, vapor pressure, etc.).

2. The amount of air disturbance expected at, or near the hood. (For example, the proximity of the hood to a door, walkway, or air conditioning grill).

3. The physical configuration of the hood including the size and shape of the normal opening, the presence or absence of internal baffles.

4. The uniformity of face velocities.

For maximum flexibility in the use of hoods, the ideal situation is to provide all hoods with air flows which ensure complete capture of all materials released within the hood. However, a savings in energy to condition make-up air, can be realized by tailoring each hood's performance to its specific use.

Outlined below is a hood classification schedule which can be used as a guideline, in conjunction with the variables mentioned above, to arrive at proper performance criteria for your laboratory hoods.

CLASSES OF HOODS

1. Class A Hoods: for handling highly toxic materials where complete control is required. For work falling into this cagegory, hoods should be designed to give an actual performance of 125 feet per minute. Such hoods should have special design characteristics depending on each individual situation. Materials handled in these hoods would include tetraethyl lead, radioactive materials, beryllium compounds, carbonyls, benzene, VCM, and materials having a similar high order of toxicity.

2. Class B Hoods: would be hoods designed to give an actual performance of 80 feet per minute face velocity. These could be used for any operations with the exception of those offering potentially severe hazards due to a high order of toxicity of materials to be handled. Basically these hoods would be used for materials having from a moderate to a high order of toxicity.

3. Class C Hoods: would be designated as those designed to give an actual performance of 50 feet per minute face velocity. These could be used for all operations where the hazard is not unusual due to a moderate or low order of toxicity of materials to be handled. This would include essentially all hydrocarbons and most likely would represent a great portion of the work required under a hood in most of the laboratories.

For assistance in determining proper classification, a list of typical compounds in each class is attached.

COMMENTS

1. Velocity readings should be taken in the center of twelve or more equal area sections over the hood face with the doors wide open. A visual check of the air flow pattern at the hood face with a ventilation smoke tube is also helpful. The smoke tube test can show where distrubing air room currents cause reverse air flow or where there are obstructions to air flow in the hood.

2. In all cases the face velocities mentioned represent minimum average velocities. To assure reasonable uniformity across the hood face, no area should have a velocity less than 80% of the average value. At no point should there be a negative flow or air flow from the hood into the room. This can be easily checked visually through the use of smoke tubes.

3. In addition to the ventilation tests, there should be a regular program for checking fan speed and the condition of the ducts, fan belts, and lubrication.

If you have a particular problem or question, give me a call.

J. J. Hall

/vm

Distribution

Aberdeen - R. Martin
A. H. Sather

Baltimore - K. W. Resh
J. A. Werneke
Rod Simmons

Hammond - ~~A. F. Appell~~
A. E. Russell
J. Burek

LCCP - S. F. Pitts
D. Zimmer

LC-VCM - P. L. Fetzer
W. V. Henry

Newark - G. P. Haberman
H. Pitera

OKC - K. L. Fogg

Ponca City - O.D. Steffey

SAL 000080527

LIST OF MATERIALS

(1) Typical Materials Requiring Class A Hoods

Asbestos
Benzene
Boron Trifluoride
Hexavalent Chromium
Phosgene
Vinyl Chloride

(2) Typical Materials Requiring Class B Hoods

Acetic acid
Acetic anhydride
Aldrin
Allyl alcohol
Ammonia
Antimony
Barium
Bromine
Butyl cellosolve
Cadmium oxide fume
Carbon disulfide
Carbon tetrachloride
Chlordane
Chlorine
Chlorine dioxide
Chlorobenzene
Chloroform
Chloropicrin
Chloroprene
Cresol
Cyanide
1,2-Dichloroethane
DDT
o-Dichlorobenzene
Dichloroethyl ether
Diisobutyl ketone
Dinitrobenzene
Dinitrotoluene
Dinitro-o-cresol
Epichlorohydrin
Fluoride
Fluorine
Formaldehyde
Furfural
Furfuryl alcohol
Glycidol
Hydrazine
Hydrogen chloride
Hydrogen cyanide
Hydrogen fluoride
Hydrogen peroxide 90%
Hydrogen sulfide
Hydroquinone
Iodine
Isophorone
Isopropylamine
Isopropyl glycidyl ether
Lead
Manganese
Mercury
Methyl cellosolve
Methyl chloride
Methyl styrene
Nitrogen dioxide
Ozone
Phenol
Phenylhydrazine
Phosphoric acid
Phosphorus
Picric acid
Silica (above 5% free silica)
Sulfur dioxide
Sulfuric acid
Sulfur monochloride

(3) Typical Materials Handled Under Class C Hoods

Acetaldehyde
Acetone
Aluminum oxide
Amyl acetate
Amyl alcohol
Butadiene
Butanone
Butyl acetate
Butyl alcohol
Carbon dioxide
Carbon monoxide
Chlorobromomethane
Cyclohexane
Dichlorodifluoromethane
1,1-Dichloroethane
Dipropyleneglycolmethylether
Dust (nuisance, no free silica)
Ethyl alcohol
Ethylbenzene
Ethyl chloride
Ethyl ether
Ethyl mercaptan
Gasoline
Heptane
Hexane
Hexanone (methyl butyl ketone)
Iron oxide fume
Magnesium oxide fume
Methyl acetylene
Methyl alcohol
Methyl chloroform
Methylene chloride
Naphtha
Octane
Pentane
Pentanone
Propyl alcohol
Silica (less than 5% free silica)
Toluene
Xylene
Zinc oxide fumes