

February 27, 1996

Ms. Dianne Manning
Robert A. Taft Laboratories (C-34)
4676 Columbia Parkway
Cincinnati OH 45226

Dear Ms. Manning,

One of the members of the AIHA respirator committee brought to my attention the draft Respirator User Notice that they had received for comment. I was the co-chair of the ANSI Z88.2 (1992) standard which has a similar requirement for filter selection. I think that the draft as currently written does little to help the average respirator user.

NIOSH believes that the DM and DFM filters certified under Part 11 do not guarantee protection against small particles. NIOSH further proposes to recommend that DM and DFM filters be used only when the particle size has a MMAD greater than 2 μm . This advice is similar to the ANSI respirator selection criteria, with several major exceptions.

My concerns are two fold, first the correctness of the advice NIOSH proposes to issue and second whether the advice helps users.

The ANSI requirements are found in sections 7.2.2.1 and 7.2.2.2. First, the user is required to: "*Determine the physical state of the contaminant. If an aerosol, determine or estimate the particle size.*" The key difference is that the user can estimate the particle size. The committee in writing this section realized that particle size measurements require some expertise but need not be measured in all situations. For most situations, a mechanically generated aerosol will have particles that are large.

For selection steps, the ANSI standard gives advice to select a paint or pesticide filter for exposures to those materials. The draft user guide does not mention these exposures. Selection continues with advice to select a HEPA filter "*If the contaminant is an aerosol, with an unknown particle size or less than 2 μm (MMAD)....*" Finally, for fumes a filter approved for fumes or a HEPA filter may be selected.

The proposed user notice gives the impression that the paint, pesticide and fume filters are inadequate. I do not know of any information that supports such a position.

From the prospective of health protection, the issuance of the draft user's notice will do little to improve the overall health of workers and stands a good chance of causing confusion and unnecessary anxiety.

The reason for this comment is that NIOSH has not made a sufficiently sound determination that the use of a DM or DMF filter poses any serious risk. The risk to health would derive from two factors, the particle size of the aerosol

RECEIVED
MAR 5 1996
NIOSH DOCKET OFFICE

and the health effects associated with the contaminant. NIOSH should consider these two factors before issuing a user's notice.

For most workplaces, the particles will be much larger than $2\mu\text{m}$. To take matter and reduce it to such a small size takes energy. Most industrial process do not expend the energy to cause such size reductions. Hinds has published data which gives shows that for many non- fume exposures, particle size is not a concern.¹ There is also data in many WPF studies which have shown that many exposures are only with large particle sizes.

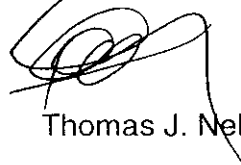
NIOSH appears to be concerned about particle size because studies show instantaneous penetration of small particles through filters. To examine the implication of this penetration, NIOSH needs to evaluate the toxicity of materials likely to be found in the workplace and the overall levels of penetration that would cause a concern.

The Part 11 DM filters were tested against a silica dust aerosol of 0.4 to $0.6\mu\text{m}$ CMD. The allowed penetration is less than 2%. This penetration would likely be less than the instantaneous penetration for a similar sized particle. Filters in used in the workplace would behave in a similar manner to the Part 11 test since filter efficiency can improve as loading occurs. Also, aerosols in the workplace would have a range of particle sizes (geometric standard deviation) that would lead to overall greater filter efficiency that test results with narrowly dispersed particles.

For most aerosols, the concern for health is the long term, not instantaneous exposure that may occur. Most solids have exposure limits that are time weighted averages. Thus penetration that may occur for a short time period has little overall health implication, provided the long term average exposure is controlled. To evaluate the potential health effects of small particle penetration, NIOSH needs the evaluate the dose that occurs. With small particles, the mass of material that would penetrate through the filter is not great.

For these reasons I believe that NIOSH has not sufficiently investigated whether a user's notice is necessary.

Sincerely,



Thomas J. Nelson, CIH

¹ Hinds, W. C. and P. Bellin: Effect of Facial- seal Leaks on Protection Provided by Half-mask Respirators. Appl, Ind. Hyg. 3(5) :158-164 (