

LETTERS TO THE EDITOR

RESPIRATORY PROTECTION FACTORS

Sir,

The tests reported in 'Assigned protection factors for two respirator types based upon workplace testing' by S. W. Lenhart and D. L. Campbell (*Ann. occup. Hyg.* **28**, 173-182, 1984) were conducted at the Herculaneum Missouri smelter of the St Joe Lead Company. We were pleased with the careful and thorough methodology used by Mr Lenhart and his colleagues as well as by his professional analysis of the data.

We would like to submit several supplementary comments based on analysis of the authors' published data:

- (1) For the negative-pressure respirators, the workplace protection factors at the Blast Furnace are significantly lower than at the Sinter Plant (although in no case is the protection factor less than 10). This observation suggests that performance factor is a function of the nature of the pollutant, e.g. particle size, morphology and chemical composition. Therefore, workplace protection factors may be substantially different in other environments.
- (2) Protection factor is a function of exposure. The workplace protection factor increases with increasing workplace exposure for both negative pressure and powered air respirators when each data set is analyzed individually. Therefore, a performance-factor requirement based on workplace exposures which offer minimal hazard may be unrealistically low.
- (3) Regardless of which respirator is worn or how high the workplace exposure is, no in-mask exposure exceeds $30 \mu\text{g m}^{-3}$. This observation suggests that both respirators offer adequate protection in the sinter plant and blast furnace of St Joe's lead smelter.

We conclude that efforts to assign protection factor values to various types of respirators serve no useful purpose and may even be misleading. Respirators are essential to protect employees' health where engineering controls cannot provide or have not yet provided adequate protection. But it is inappropriate to mandate the use of specific respirators by government regulation or rigid professional guidelines. What respirator to use in any given workplace environment should be dictated by experience and judgement. In the case of the lead industry, the blood lead level of the employees is the prime indicator of the adequacy of respiratory protection. The steady and continuing drop in blood leads throughout the industry is indisputable evidence that the industry's respirator practices, which rely heavily on the two respirators studied, are indeed effective.

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