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To: NIOSH Docket Office
 Robert A. Taft Laboratories, M/S C34
 4676 Columbia Parkway
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Re: Comment on 42 CFR Part 84

To whom it may concern:

Recommendations

The NIOSH/OSHA approach to isocyanates perfectly illustrates the complete lack of efficacy of current personal protective equipment regulations. Tightening airborne exposures and demanding the highest level of respiratory protection is obviously not working; the incidence of occupational asthma is still rising. As early as 1985 there was credible proof that air purifying respirators were good protection against isocyanates and that the associated organic vapors could serve as excellent breakthrough indicators^{1,2}. New data has shown that test animals are more likely to get respiratory sensitivities from dermal exposures than from airborne exposures³. Air monitoring methods for isocyanates have been called into question^{4,5,6}. The isocyanates predominately used in automotive paints (and in many isocyanate catalyzed industrial coatings) rely on the "pure" isocyanate polymer but regulators are still talking about isocyanates like they are vapors or gasses. Personal observations from the field and resulting test data indicate polyisocyanates act much more like aerosols than vapors. The end result of this combination of problems is that regulators can point to statistics linking isocyanates to worker illness, industry continues to pump out more and more isocyanate species with new CAS numbers and new sampling demands (all the time

¹J.F. Vasta: Respirator Cartridge Evaluation for Isocyanate Containing Imron® and Centari® Enamels. *Am. Ind. Hyg. Assoc. J.* January 1985 p. 39-44

²V. Dharmarajan, R.D. Lingg, D.R. Hackathorn: Evaluation of Air-Purifying Respirators for Protection Against Toluene Diisocyanate Vapors. *Am. Ind. Hyg. Assoc. J.* July 1986 p. 393-98

³R.J. Rattray, P.A. Botham, P.M. Hext, D.R. Woodstock, I. Fielding, R.J. Dearman, I. Kimber: Introduction of Respiratory Hypersensitivity to Diphenylmethane-4,4' -diisocyanate (MDI) in Guinea Pigs. Influence of Route of Exposure. *Toxicology* 88 (94)

⁴W.E. Rudzinski, B. Dahlquist, S.A. Svejda, A. Richardson, T. Thomas: Sampling and Analysis of Isocyanates in Spray-Painting Operations. *Am. Ind. Hyg. Assoc. J.* March 1995 p.284-89

⁵A. Maitre, A. Leplay, A. Perdrix, G. Ohl, P. Boinay, S. Romazini, J.C. Aubrun: Comparison Between Solid Sampler and Impinger for Evaluation of Occupational Exposure to 1,6-Hexamethylene Diisocyanate Polyisocyanates During Spray Painting. *Am. Ind. Hyg. Assoc. J.* February 1996 p.153-56

⁶Worker Exposure to Isocyanates *Am. Ind. Hyg. Assoc. J.* February 1992 p.146-52

fighting aggregate listing and aggregate PELs⁷), small businesses are investing in compliance instead of health, and workers are getting sick. NIOSH and OSHA are as much to blame as the chemical manufacturers, employers, or the employees (who deserve some of the blame because they often overexpose themselves despite the best efforts of diligent employers).

In the short term NIOSH needs to set protocols for independent certification of respirators and to completely abandon in-house certification of respirators. Private industry would be much more efficient at testing new respirators. NIOSH should also tightly regulate the private companies who certify to test respirators. NIOSH should be given the authority to strictly enforce quality control. Companies approved to certify respirators should face stiff penalties for falsifying any records or in any way violating the procedures set forth in those protocols.

NIOSH could then focus its attention on task specific protective equipment like end-of-service-life indicators for polyisocyanate catalyzed paints.

I am against any funding of NIOSH so that NIOSH can spend years developing the capacity to test the specialized PPE mentioned above -- this is the domain of private industry. The government should set clear guidelines and enforce them. No design specification, no command-and-control -- that doesn't work!

In the 42 CFR Part 84 public comment session in Northglenn, Colorado⁸ I was asked if body shop owners are sophisticated enough to select the proper respirator if NIOSH pushes forward with end-of-service-life respirators or task specific respirators. This question proves your lack of understanding of the realities of regulatory compliance -- you have already made compliance nearly impossible.

Background

ACE Systems, Ltd. has been writing safety programs for auto body shops for 4½ years. Several pitfalls have become abundantly clear. This background is provided to illustrate the extreme problems encountered in trying to comply with respiratory protection regulations (specifically respirator selection for protection against isocyanate catalyzed paints).

Air Monitoring

In January of 1995 ACE Systems, Ltd. was hired by an auto body shop to help them answer an OSHA complaint letter which included a question of airborne exposures and respirator selection. We subcontracted the services of an industrial hygiene specialist to characterize employee exposure. We sampled for the most abundant solvents in the paint, respirable dust, and welding fumes. The highest exposure relative to PEL was about 5%.

⁷ 40 CFR Part 372 [OPPTS-400082B; FRL-4922-2] Chemicals; Toxic Chemical Release Reporting; Community Right-To-Know; Chemicals p.43-46

⁸ Federal Register: May 16, 1996 (volume 61, Number 96) Pg. 24740-24743

In February of 1995 we were hired by another body shop under similar circumstances. This time we monitored for respirable dust, xylene, Isocyanates (using OSHA method 42), monoethanolamine, and hydrofluoric acid (the last two due to a specific complaint about detail supplies). Again dust levels were 7% of PEL, xylene was less than 2% of PEL, isocyanates monomers, monoethanolamine, and hydrofluoric acid were undetectable.

This knowledge created a great deal of confusion in the minds of these clients. I asked OSHA how I should handle their respiratory protection programs, but I only received vague answers warning great care, and cryptic proclamations about OSHA having to prove the employees were overexposed before they could cite anyone.

I was not satisfied with the isocyanate results (<0.0004 ppm) because the day we monitored was a relatively high exposure day, so I started researching air monitoring. I was put in touch with the NIOSH branch manager who had done isocyanate monitoring in and around paint booths at body shops (NIOSH method 5522 presumably). He told me that he found considerable exposure in the booth, small quantities behind the filters and no detectable quantities at the stack discharge. Still doubtful about the value of air monitoring I started telling my client to get and use Supplied Air Respirators (SAR). One of my clients objected saying he had spent thousands of dollars on SAR and many hours warning and threatening employees to get them to wear them -- finally abandoning the SAR to the scrap heap. I told this client that we could do air monitoring and if his employees were below exposure limits he wouldn't have to require the use of SAR. He submitted a request for NIOSH health evaluation & technical assistance (HETA). His shop and three other body shops had extensive monitoring done. Again mixture RELs were 2-30% for total solvents, under worst case conditions the polyisocyanate exposures were 50% of industry recommendations (.5 mg/m³), and total dusts measured in the painter's breathing space just at or well below PELs.

Research into air monitoring techniques lead to a contact with Colorometric Labs, Inc. who makes isocyanate color change indicators for detecting dermal and surface exposures. They have also developed an isocyanate end-of-service-life indicator respirator. I called NIOSH Morgantown to find out what needed to be done to make this needed and practical respirator available. I was told that NIOSH had not taken any new respirator certifications for a year due to the backlog from 42 CFR Part 84 particulate mask certification requests and that the NIOSH testing labs were badly out of date.

I submitted a request for interpretation to OSHA when we received the preliminary reports from the HETA (#95-0311). I also asked if the Powered Air Purifying Respirator with an isocyanate end-of-service-life indicator which has been developed, tested and patented could be accepted by OSHA until NIOSH got up to speed on isocyanates. I was referred back to NIOSH.

In the meantime other clients were buying, installing and beginning to use SAR. Many problems were encountered; one client installed his own SAR using PVC pipe and ABS glue; another purchased a belt mounted unit which wasn't properly NIOSH certified and which lacked the CO alarm required by OSHA in systems relying on oil wetted compressors; yet another did a relatively good job buying and installing the SAR only to have employees tamper with the CO alarm

because the CO alarm sampled ambient air as well as line air, causing frequent annoying transient alarm conditions when a car drove by the monitor.

I decided to get more involved and proceeded to shop out SAR systems. The results were alarming. Most of my clients were buying their equipment from local paint or paint equipment suppliers. Some of these suppliers were actually installing and maintaining the systems in the body shops. With few exceptions none of them knew anything about breathing air regulations beyond what you could read in the promotional literature. I called around and identified local experts in breathing air and asked for specifications and prices. I wouldn't trust some of the "industry experts" to change my tires let alone set up my clients' breathing air systems. Those who seemed truly expert didn't carry small enough, affordable enough systems for body shops and were generally not interested in selling systems under \$10,000. My clients were being presented \$700-\$3,000 systems by their vendors.

I became aware of several studies which call into question the reliability of both the OSHA coated fiber methods and the OSHA and NIOSH impinger methods. In the second round of the HETA air monitoring we started looking at dermal exposures to isocyanates using color change indicators made by Colorometric Labs, Inc. We found that mixing room bench solvents, paint gun cleaners, and "wash thinners" (cheap thinner usually purchased in 55 gallon drums) contaminated isocyanates to varying degrees. Bulk samples of these thinners showed no detectable isocyanate monomers but 0.02-0.22% polyisocyanate. Additionally, we checked dermal exposure to isocyanates in the overspray (using color change indicators) while painters were spraying paint, but found little or no color change. This, in combination with the animal studies showing that dermal exposure is more likely to cause respiratory reactions than airborne exposure, tells me that we should allow air purifying respirators for isocyanates (when detectable organic vapors are present) and that we should begin to focus on dermal protection.

The difficulty complying with respiratory protection regulations has caused many auto body shop owners to avoid the issue completely. Most of them simply issue paint spray respirators and hope they don't get caught. In reality they are just as exposed to citation if they fit test their employees in an Air Purifying Respirator (APR) or install SAR.

It's time to stop focusing so much on how to save your own program and start implementing common sense reforms. NIOSH has a place in this process but it is not in producing certified respirators. NIOSH must turn its attention to setting and enforcing health based standards and leave the nuts-and-bolts to industry.

Sincerely,



Robb Menzies
President