No link was found between silica exposure monitoring results and workers' compensation claims filed. Only 5 (10%) of the companies with exposures above the OSHA PEL has ever had a claim filed for silicosis. A total of 7 (5.5%) companies where exposure monitoring was conducted have had a claim filed. Of all the companies visited, a total of 11 claims had been filed.

Silicosis workers' compensation claims in Ohio have been decreasing over the last 10 years. A total of 870 silicosis claims have been filed since 1948. The peak year for silicosis claims, was 1985 when 103 (12%) claims were filed. The six-year time frame from 1984 to 1989 had a total of 295 (34%) claims filed. In the last 6 years there have been a total of 120(14%) claims filed, or an average of about 20 claims a year. At $140,000 average per allowed claim, 2.8 million dollars in compensation are currently paid each year.

221.

MORTALITY, CANCER INCIDENCE, AND WORKPLACE EXPOSURES AMONG ONTARIO CONSTRUCTION WORKERS: EXPOSURE ASSESSMENT.
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A two-year study, funded by the Workplace Safety and Insurance Board of Ontario, was undertaken to assess the cancer and mortality experience of 300,000 unionized and non-unionized Ontario construction workers and to review their patterns of exposure to a variety of workplace toxins.

A qualitative and quantitative review of chemical exposures was made at a number of construction sites in Ontario. Bulk samples were collected for analysis. Hygienic practices and personal protective equipment (PPE) were also evaluated. As a range-finding exercise, air sampling using the Task-Based Exposure Assessment Methodology (T-BEAM) approach was carried out. Occupational air samples were collected on operating engineers, construction labourers, painters, plumbers, insulators, masons, and iron workers. Where necessary, area sampling or shadow sampling was conducted.

Significant exposures to total, inhalable, and/or respirable particulate were found during demolition work, abrasive blasting of steel, cutting/chipping of concrete, and mixing/spraying of fireproofing. High levels of solvents and organic vapours were noted during painting and roofing operations. Arc welding, thermal cutting and gouging also produced significant results. Concentrations of some workplace contaminants exceeded five times the respective ACGIH TLV-TWA's. T-BEAM did not yield meaningful results when analytical detection limits were high or total filter loading was low. This occurred when diesel exhaust and silica were analyzed. High rates of smoking were observed. There was significant interaction between trades, suggesting that some workers are exposed to contaminants not related to the tasks they perform. PPE was often inappropriate, used improperly, or not used at all.

High exposure activities associated with demolition and sprayed fireproofing require detailed analysis. To improve exposure determination when using T-BEAM, multi-shift sampling should be considered along with bulk-sampling when low concentrations of an occupational contaminant are expected. Secondary exposures among construction workers should be studied more thoroughly.

222.

THE EFFECT OF LEV CONTROLS ON DUST EXPOSURES DURING SURFACE GRINDING AT CONSTRUCTION SITES.
G. Croteau, M. Flanagan, N. Seixas, J. Camp, University of Washington, Seattle, WA

Exposures to crystalline silica can result from construction activities in which dust is generated during the cutting, grinding or drilling of concrete, brick, stone and similar building materials.

Limited exposure monitoring and epidemiology studies indicate that construction workers engaged in such work activities are at an increased risk for silicosis. Given the constraints and limited effectiveness of administrative, process and PPE controls, engineering controls provide the best means of reducing respirable dust and crystalline silica exposures. Engineering controls that are currently available include the application of a water spray or local exhaust ventilation (LEV) at the point of dust generation. Despite the commercial availability of LEV systems for selected masonry tools, few studies have evaluated their effectiveness. The primary objective of this study was to assess the effectiveness of commercially available LEV systems for controlling respirable dust and crystalline silica exposures during surface grinding at construction sites. The use of LEV for controlling silica dust exposures during surface grinding was assessed at five different construction sites in the Seattle area. Respirable dust and crystalline silica exposures for construction workers were compared with and without use of LEV. During a given day, the worker alternated between the use of LEV and no control over the entire work shift, with each work session lasting 30 to 45 minutes. Respirable particulate monitoring was accomplished using a personal data logging real-time aerosol monitor (pDR). Study results indicated that exposure reduction ranged from 57 to 99.9 percent. This variability in control is attributed to the varying conditions including, type of surface being prepared, wind speed, enclosed/non-enclosed work setting and exposure from other dust sources.

223.

BARRIERS TO EXPANDING THE USE OF VACUUM ATTACHMENTS IN DRY-WALL SANDING: A NATIONAL SURVEY OF UNION CONTRACTORS AND FINISHERS.
T. Bushnell, L. Blade, NIOSH, Cincinnati, OH; D. Ashyk, United Labor Agency and Cleveland State University, Cleveland, OH

Exposure to silica-containing dust has been measured at high levels for workers who sand drywall. For many years, vacuum attachments that effectively protect against dust exposure have been available, and yet anecdotal evidence suggests that they are not usually used. Surveys of contractors and drywall finishers were conducted in order to identify real and perceived barriers to the more widespread use of vacuum attachments. Survey samples were drawn from lists of drywall contractors and finishers in twelve district councils and seven locals of the International Union of Painters and Allied Trades in eleven states in the West, Midwest, and East. There were 88 responses to the contractor survey and 214 responses to the finisher survey. The results suggest that well over half of contractors recognize respiratory problems as a hazard of drywall finishing. While most finishers (57 percent) and contractors (75 percent) have at least some experience with vacuum attachments, the survey shows that they are virtually never used for the purpose of protecting workers from dust. Rather, they are used primarily to protect electronic equipment and building owners' personnel. Although attachments are used on only a small fraction of jobs, 62 percent of finishers say they never use respirators.

The primary complaint about vacuum attachments is that they make jobs take longer and cost more. Yet the results suggest that contractors are not always able to charge more for using them, even in cases where the building owner requires it. Some contractor responses point to the possibility that more thorough training of workers in the use of vacuum attachments might eliminate the productivity and quality problems that many say they experience.

PF 130. Management/Leadership

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224.

INDUSTRIAL HYGIENE UNIVERSAL METRIC: A LEADING INDICATOR.
P. Esposito, STAR Consultants, Inc., Annapolis, MD

Many health professionals look for improved communication methods to measure industrial hygiene program performance. In addition, they look for ways where someone could predict, with some degree of confidence, that an industrial hygiene program will or will not help prevent occupational diseases. Leading metrics are often used by industry and professionals to predict the occurrence of occupational disease. Using a management

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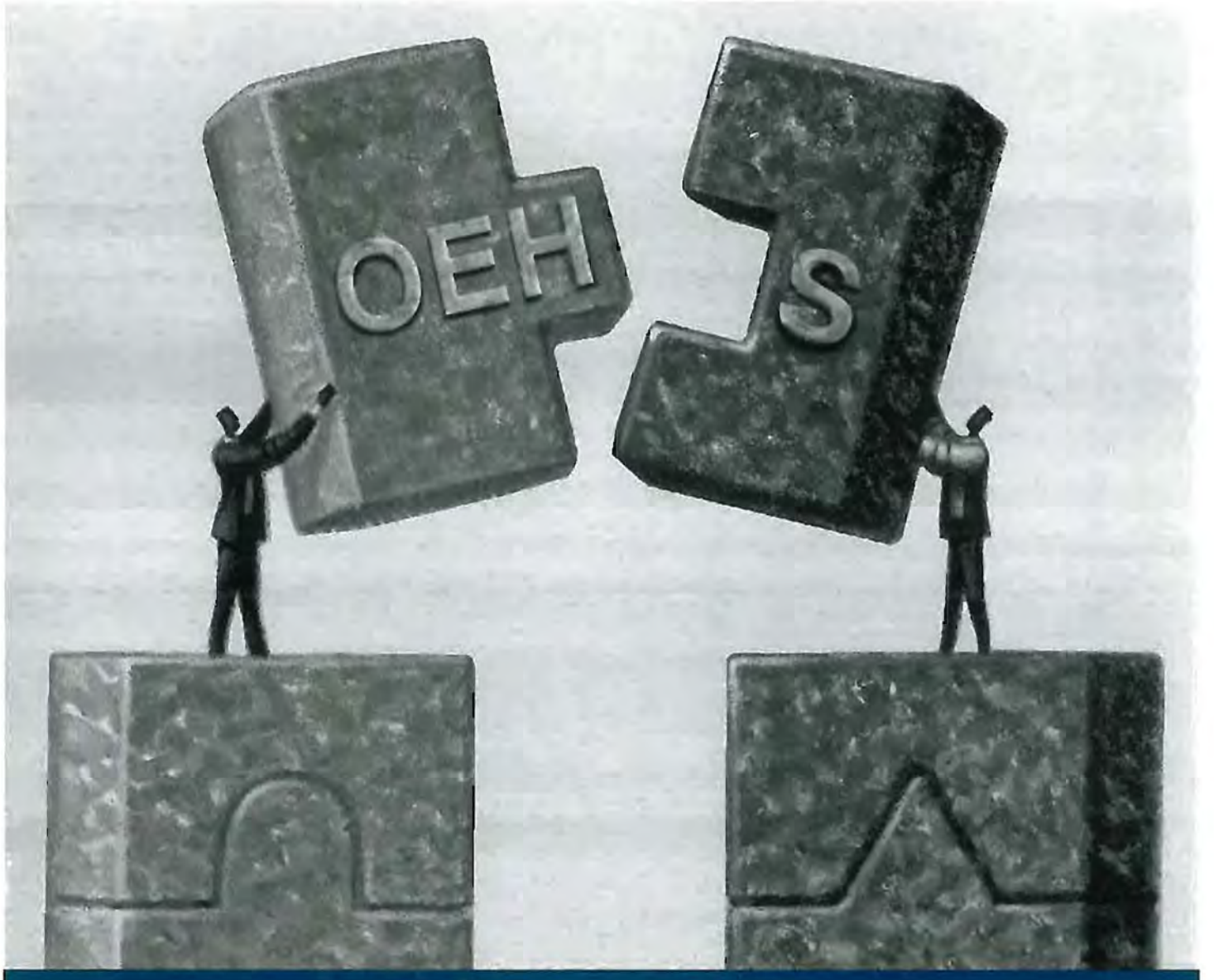

ABSTRACTS

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2002 Abstract Index by Session Topic

PF 101 Agricultural Health and Safety

Papers 1–6

1.

RELATIONSHIPS BETWEEN WORK EXPOSURE AND RESPIRATORY OUTCOMES IN POULTRY WORKERS.

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A pilot study was conducted on 74 poultry barn workers in Western Canada during the winters of 1998–2000. General respiratory health, current, chronic and work related respiratory symptoms; general work duties, and work-site factors were ascertained, pre-exposure, by questionnaire. Personal airborne exposure levels and changes in symptoms and lung function were measured across the work-shift for all workers. Workers were classified according to the type of poultry operation (floor based, n=53; cage based, n=13) in which they worked. There was no significant difference in daily hours spent in the barn between those who worked with caged poultry (5.41±2.35 hours) and those who worked with floor-based poultry (4.42±2.48 hours). Age of birds was 47.10±58.36 days for floor based versus 155.91±63.01 days for cage based facilities. There were no significant differences in personal environmental measurements between cage-based and floor-based facilities (ammonia 13.22±13.70 ppm, 17.34±16.35 ppm; total dust 5.74±4.85mg/m^3, 10.01 ±8.84 mg/m^3; endotoxin 6046±6089 EU/m^3, 5457±5934 EU/m^3 respectively). There were no significant differences in across work-shift change in pulmonary function indices between workers from cage and floor-based operations. For the entire sample total dust dose (work hours/day x total dust) significantly correlated with across-shift change in FEV_1, whereas endotoxin dose and ammonia dose did not. Stocking density was significantly correlated with average ammonia (ppm, p=0.002) and ammonia dose (ppm x work hours/day; p=0.004) in floor based operations and with total dust (particles/ml, p=0.002) in cage based populations. Stocking density was also significantly correlated with chronic cough (p=0.003) and across work-shift cough (p=0.05) and chest tightness (p=0.06) for workers from floor based operations; and with phlegm when working (p=0.018) and chest tightness across the work-shift (p=0.004) for workers from cage based operations. Type of poultry production operation and therefore type of work exposures appear to significantly impact symptoms experienced by workers exposed to these atmospheres.

2.

DUST GENERATION SYSTEM FOR AGRICULTURAL SOIL DUST.

K. Lee, R. Domingo-Neumann, R. Southard, UC Davis, Davis, CA

Agricultural workers are prone to exposure to mixed dust of inorganic and organic compounds. Diverse working conditions and operations in agriculture make direct measurements of the mixed dust exposure difficult. This study was conducted to develop a new dust generation system to determine possible exposure potency indicators of soil samples. The dust generator consists of a blower, a rotating chamber and a settling chamber. The rotating chamber has inner baffles to provide sufficient agitation of the samples while the chamber is rotating. A blower provides air into the rotating chamber, and the suspended dust is moved to the settling chamber through a perforated pipe. A small fan inside the settling chamber helps maintain suspension of the dust. Various size fractions of dust are sampled on filters suspended in the chamber via outlet ports and attached pumps. Air pressure is released through a filter plate mounted on the wall of the settling chamber. Various operating conditions were evaluated: air intake from blower, speed of rotation, soil mass and sampling time. To evaluate the characteristics of dust from the system, we collected dust samples from agricultural fields while the soil was prepared for