

Respirator use and practices in the Paper and Allied Products manufacturing establishments: Results of a national survey of private sector employers

Survey Exposes some Shortcomings in Respirator Programs

By BRENT DONEY, MARK GRESKEVITCH, DENNIS GROCE, GIRIJA SYAMLAL and KI MOON BANG

In 2001, the *Survey of Respirator Use and Practices* gathered information on respirator use from 40,002 randomly selected US establishments.¹ The survey collected data on the types of respiratory protection used by workers at an establishment, types of respirator fit tests performed and presence of substances that prompted the decision to use respiratory protection.

The findings of the survey raised questions regarding respirator use practices and how these practices compare with Occupational Safety and Health Administration (OSHA) regulations² and National Institute for Occupational Safety and Health (NIOSH) recommendations.³

This report focuses on information from the respirator use and practices survey collected from establishments in the Paper and Allied Products industry (Standard Industrial Classification 26).⁴ This industry includes establishments engaged in the manufacturing of pulps from wood and other cellulose fibers, and from rags; paper and paperboard and paper and paperboard converted products such as paper bags, paper boxes, and envelopes. During these processes various dusts and chemicals might be released causing adverse health effects in workers. In circumstances where ventilation or substitution with a less toxic chemical is not an option respiratory protection may be the only protection available to workers.

Findings and Discussion

Approximately 9.4% or an estimated 674 establishments in the Paper and Allied Products industry used respirators for required purposes in 2001 as compared with All Private Industry (4.5%). Also, workers in the Paper and Allied Products industry used respirators in greater proportions (4.8%) than workers in All Private Industry (3.1%). Compared with All Private Industry, a smaller proportion of respirator-using establishments in Paper and Allied Products used disposable dust masks (69% vs 71.3), and a larger proportion used air-supplied respirators (2.8% vs 0.7%).¹

Respiratory protection program quality indicators: Each of the following elements (developed on the basis of OSHA requirements² and NIOSH recommendations³) is an important part of an effective respirator program. The percentage of establishments in the Paper and Allied Products industry using respirators with indicators of a potentially inadequate respiratory protection program is listed in parenthesis.

- Does the program require use of the manufacturer user's instructions or NIOSH certification labels to adjust the airflow for airline respirators? (86% of establishments using airline respirators did not require such use of instructions or labels or didn't know how airflow was adjusted)
- Is there a written change-out schedule for air-purifying gas/vapor filters? (66% of respirator-using establishments using gas/vapor filters did not have a written change-out schedule)
- Do written procedures include a regularly scheduled evaluation of the effectiveness of respirators used at the establishment? (52% of respirator-using establishments did not include such an evaluation or were unaware if evaluations had been conducted)
- Does the program include a trained respirator program administrator? (46% of respirator-using establishments did not have a trained program administrator)
- Has management adopted a written respirator program that determines how respirators are used? (35% of respirator-using establishments had not adopted a written program)
- Does the program include written procedures for maintaining respirators? (33% of respirator-using establishments did not include such procedures or didn't know if there were procedures)
- Does the program provide training regarding the need, use, limitations and capabilities of respirators? (29% of respirator-using establishments did not provide the training)
- Are wearers of tight-fitting respirators fit tested? (23% of respirator-using establishments with tight-fitting respirators did not provide fit testing or didn't know if fit testing was conducted)
- Are dust masks used (filtering-face piece respirators) to protect only against dusts, but not gases or vapors? (19% of respirator-using establishments did not use dust masks only against dust)
- Are employees assessed for medical fitness to wear respirators? (9% of respirator-using establishments did not provide the assessment or didn't know if an assessment was conducted)
- Are airline respirator couplings incompatible with other gas systems at the establishment? (Due to the small number of responses to this question percentage was not calculated)

Of the respirator-using Paper and Allied Products establishments, 49%, or an estimated 331 establishments, had three or more indicators of a potentially inadequate respiratory protection program.

Certain hazardous airborne chemicals can be present during

manufacturing activities in the Paper and Allied Products industry. For example, chlorine and chlorine dioxide are used in pulp bleaching and have been associated with asthma and can cause respiratory failure and fluid in the lungs. Hydrogen sulfide can be generated if black liquor from pulping contacts acids. It can be immediately fatal at high concentrations without adequate respiratory protection. Other effects, depending on the concentration, can include eye damage and lung damage.^{5,6}

Maintenance and repair activities in the Paper and Allied Products industry (e.g., abrasive blasting, welding, grinding, chipping, and spray painting) can result in exposures to airborne contaminants.⁵ For example, workers can be exposed to metal fumes from welding and thermal cutting, silica (a component in sand and in rocks like sandstone and granite) from abrasive blasting, solvents from metal cleaning, and solvents and isocyanates from painting and coating metals.⁵ These exposures are associated with various respiratory conditions. Exposure to welding fumes can cause metal fume fever or lead intoxication,⁵ exposure to silica can cause silicosis^{7,8} and exposure to isocyanates can cause work-related asthma.^{5,8}

While the survey design does not allow determination of particular substances that prompted respirator use specifically for Paper and Allied Products, results of the survey provide such information for the parent industry, Manufacturing. There, dust, paint vapors, solvents, welding fumes and silica dust were the substances for which respirators were most frequently used. Historical data from a NIOSH exposure survey conducted from 1981-1983 estimated that in Paper and Allied Products 6,000 US workers were exposed to sawdust, 58,000 were exposed to silica dust, 77,000 were exposed to sodium hydroxide, 26,000 were exposed to sulfuric acid, and 32,000 were exposed to xylene (used as a solvent).⁹

The survey findings are subject to some limitations. Public sector, self-employed and agriculture establishments with fewer than 11 workers were not included in the survey. Although the instructions stated that the person most familiar with respiratory protection should complete the questionnaire, this may not have always happened. In spite of the cognitive and field testing of the survey at small, medium and large establishments prior to its mailing, recipients may have misinterpreted the written questions. The survey was not designed to collect exposure information specifically for Paper and Allied Products, though it did collect such information for the broader industry category of Manufacturing.

Respiratory Protection Program Consultation Service

Employers who suspect their respiratory protection program is in need of improvement should consider contacting the OSHA free confidential consultation service available for small businesses in every state. OSHA also has a *Small Entity Compliance Guide for the Revised Respiratory Protection Standard* available at www.osha.gov/Publications/secgrev-current.pdf.

Another resource is the American Industrial Hygiene Association list of consultants at www.aiha.org/Content/AccessInfo/consult/consulting.htm.

P&P

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

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FEATURES

- 22 IT AND THE BIG PICTURE**
Cascades Tissue Group installed a manufacturing execution system
- 26 SAFETY SHORTCOMINGS EXPOSED**
Results of a national survey of private sector employees
- 30 ASIA GETS THE SPEED BUG**
State-of-the-art machines start to rewrite the record books
- 32 KEEP AN EYE ON THESE FIVE**
Mergers and acquisitions dominate among the prominent newsmakers
- 34 EXTRA WHITE AND EXTRA BRIGHT**
New technology allows papermakers to meet new standards
- 38 PULLING THE PLUG ON GHG EMISSIONS**
A report cites several options available to reduce greenhouse gas emissions
- 42 OUT OF THE MIST**
Mist in and around paper machines has plagued mills for years
- 44 EXPANDING WHILE INNOVATING**
A new warehouse, years of experience make North Carolina ports a smart option
- 46 LATIN AMERICAN CEO OF THE YEAR**
José Luciano Penido has been voted RISI Latin American CEO of the Year

OPINION

- 5 FROM THE EDITORS**
News is still news
- 19 LABOR MANAGEMENT**
Parachute packers
- 21 CHEMICAL MARKETS**
Pulp aid from Dow Corning
- 56 COMMENT**
Cross currents in the US containerboard markets

DEPARTMENTS

- 6-13 NEWS SCAN**
■ Temple-Inland ■ Tembec
■ Canfor ■ NewPage
- 15 MONTH IN STATISTICS**
- 16 PRODUCT NEWS**
- 17 GRADE PROFILE**
- 18 PEOPLE NEWS**
- 20 CONFERENCE CALENDAR**
- 51 SUPPLIER NEWS**

SERVICES

- 53 ADVERTISER SHOWCASE**
- 54-55 MARKETPLACE**
- 55 ADVERTISERS INDEX**

THE COVER

Although only responsible for a small percentage of GHG emissions from the industrial and waste sector, a new report from McKinsey and Company documents many clusters of opportunities for the industry to help reduce these emissions. Many of them would also help conserve energy. They range from improved ventilation in buildings to more efficient motors to the use of cellulosic biofuels.



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