CATEGORY: Safety Management
CDC-SM-2009-01
DATE OF ISSUE: 6-22-2009
PROPONENT: Office of Health and Safety, Office of the Director

INDOOR ENVIRONMENTAL QUALITY POLICY

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1. PURPOSE AND SCOPE

This policy establishes guidance and procedures to protect and maintain safe indoor environmental quality (IEQ) and guidelines for reporting and investigating complaints. This policy applies to all CDC[1] workers (employees, contractors, guest researchers, etc.) at all CDC facilities, both leased and owned, and all CDC work areas including animal facilities.

2. BACKGROUND

Indoor environmental quality concerns relate to air quality and other environmental factors (lighting, cleanliness, etc.) in office workplaces. CDC is committed to providing all CDC workers a safe place of employment, and will take actions to keep the workplace free of recognized hazards. When possible, the agency will take steps to eliminate or materially reduce recognized workplace hazards.

The goal of this policy is to: promote and protect the health and well being of CDC personnel, contractors, and visitors; prevent work-related injury and illness; prevent harm to and pollution of the environment; and ensure compliance with all applicable federal, state, and local regulations.

The goal for safe IEQ is an on-going and high priority CDC commitment. This policy provides a clear statement of CDC management's commitment to implement and continually improve a comprehensive and effective health, safety and environmental protection program.

3. POLICY

CDC strives to maintain indoor environmental quality standards that protect the health of workers. This policy establishes guidance and procedures to protect and maintain safe IEQ and for reporting and investigating complaints. Specific guidance is provided in the

[1] References to CDC also apply to the Agency for Toxic Substances and Disease Registry (ATSDR).

appendix "Indoor Environmental Quality Guidelines." All CDC facilities (leased or owned) are subject to this policy and the major components are identified below:

A. **Prevention and Management of IEQ Concerns During Construction and Renovation Projects**
Key factors must be assessed by the Office of Health and Safety (OHS) and/or local Safety Officer and the Buildings and Facilities Office (BFO) during a renovation or construction project.

B. **Building Operation and Maintenance**
CDC and the BFO commits to operating and maintaining CDC's owned and leased facilities using best practices that cause minimal interruption to workers and protect them from hazards.

C. **Building Occupants**
It is important that personnel be aware that the use of some personal care products may have detrimental effects on the health of chemically sensitive co-workers. Personal care products (colognes, perfumes, essential oils and scented skin and hair products) should not be brought into, used, or otherwise applied at or near actual workstations, in restrooms, or anywhere in CDC facilities.

D. **Communication**
Information must be communicated among all affected parties in a timely manner relating to materials used in buildings (e.g., cleaning supplies, chemicals, personal care products), and maintenance activities that may potentially affect air quality so that preventive measures can be taken in advance. At least five (5) working days notice must be normally given before construction and maintenance activities are undertaken or new chemicals introduced.

E. **Evaluation of IEQ Concerns**
Building occupants who experience irritation or symptoms that may be related to the quality of indoor air should notify their supervisors, and the OHS or local Safety Officer to initiate a complaint. BFO must also be contacted upon initiation of a complaint, to identify and/or review any potential structural, maintenance, or heating, ventilating or air conditioning (HVAC) issues. Building occupants must also complete the Indoor Air Quality Questionnaire (see Attachment B) in order to properly document the complaint. Each IEQ complaint poses a unique set of circumstances that will determine the investigative procedures used to resolve each IEQ concerns.

4. RESPONSIBILITIES

A. **Office of Health and Safety/Designated Safety Officer**
Administers the Indoor Environmental Quality Program and serves as the primary coordinator and investigator for reported incidents involving IEQ hazards or conditions; educates CDC supervisors and workers; develops report findings and recommendations for corrective action; and reviews and updates to meet future needs and regulatory changes.

B. **Occupational Health Clinic**
Conducts medical evaluations as required and contacts OHS to initiate investigation of reported health problems related to the work environment.

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For Immediate Release
Oct. 26, 2010

Scented consumer products shown to emit many unlisted chemicals

The sweet smell of fresh laundry may contain a sour note. Widely used fragranced products – including those that claim to be "green" – give off many chemicals that are not listed on the label, including some that are classified as toxic.

A study led by the University of Washington discovered that 25 commonly used scented products emit an average of 17 chemicals each. Of the 133 different chemicals detected, nearly a quarter are classified as toxic or hazardous under at least one federal law. Only one emitted compound was listed on a product label, and only two were publicly disclosed anywhere. The article is published online today in the journal Environmental Impact Assessment Review.

"We analyzed best-selling products, and about half of them made some claim about being green, organic, or natural," said lead author Anne Steinemann, a UW professor of civil and environmental engineering and of public affairs. "Surprisingly, the green products' emissions of hazardous chemicals were not significantly different from the other products."

More than a third of the products emitted at least one chemical classified as a probable carcinogen by the U.S. Environmental Protection Agency, and for which the EPA sets no safe exposure level.

Manufacturers are not required to disclose any ingredients in cleaning supplies, air fresheners or laundry products, all of which are regulated by the Consumer Product Safety Commission. Neither these nor personal care products, which are regulated by the Food and Drug Administration, are required to list ingredients used in fragrances, even though a single "fragrance" in a product can be a mixture of up to several hundred ingredients, Steinemann said.

So Steinemann and colleagues have used chemical sleuthing to discover what is emitted by the scented products commonly used in homes, public spaces and workplaces.

The study analyzed air fresheners including sprays, solids and oils; laundry products including detergents, fabric softeners and dryer sheets; personal care products such as soaps, hand sanitizers, lotions, deodorant and shampoos; and cleaning products including disinfectants,

all-purpose sprays and dish detergent. All were widely used brands, with more than half being the top-selling product in its category.

Researchers placed a sample of each product in a closed glass container at room temperature and then analyzed the surrounding air for volatile organic compounds, small molecules that evaporate off a product's surface. They detected chemical concentrations ranging from 100 micrograms per cubic meter (the minimum value reported) to more than 1.6 million micrograms per cubic meter.

The most common emissions included limonene, a compound with a citrus scent; alpha-pinene and beta-pinene, compounds with a pine scent; ethanol; and acetone, a solvent found in nail polish remover.

All products emitted at least one chemical classified as toxic or hazardous. Eleven products emitted at least one probable carcinogen according to the EPA. These included acetaldehyde, 1,4-dioxane, formaldehyde and methylene chloride.

The only chemical listed on any product label was ethanol, and the only additional substance listed on a chemical safety report, known as a material safety data sheet, was 2-butoxyethanol.

"The products emitted more than 420 chemicals, collectively, but virtually none of them were disclosed to consumers, anywhere," Steinemann said.

Because product formulations are confidential, it was not possible to determine whether a chemical came from the product base, the fragrance added to the product, or both.

Tables included with the article list all chemicals emitted by each product and the associated concentrations, although do not disclose the products' brand names.

"We don't want to give people the impression that if we reported on product 'A' and they buy product 'B,' that they're safe," Steinemann said. "We found potentially hazardous chemicals in all of the fragranced products we tested."

The study establishes the presence of various chemicals but makes no claims about the possible health effects. Two national surveys published by Steinemann and a colleague in 2009 found that about 20 percent of the population reported adverse health effects from air fresheners, and about 10 percent complained of adverse effects from laundry products vented to the outdoors. Among asthmatics, such complaints were roughly twice as common.

The Household Product Labeling Act, currently being reviewed by the U.S. Senate, would require manufacturers to list ingredients in air fresheners, soaps, laundry supplies and

other consumer products. Steinemann says she is interested in fragrance mixtures, which are included in the proposed labeling act, because of the potential for unwanted exposure, or what she calls "secondhand scents."

As for what consumers who want to avoid such chemicals should do in the meantime, Steinemann suggests using simpler options such as cleaning with vinegar and baking soda, opening windows for ventilation, and using products without any fragrance.

"In the past two years, I've received more than 1,000 e-mails, messages, and telephone calls from people saying: 'Thank you for doing this research, these products are making me sick, and now I can start to understand why,'" Steinemann said.

Steinemann is currently a visiting professor in civil and environmental engineering at Stanford University. Co-authors are Ian MacGregor and Sydney Gordon at Battelle Memorial Institute in Columbus, Ohio; Lisa Gallagher, Amy Davis and Daniel Ribeiro at the UW; and Lance Wallace, retired from the U.S. Environmental Protection Agency. The research was partially funded by Seattle Public Utilities.

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For more information, contact Steinemann at 206-616-2661 or acstein@uw.edu. Steinemann is currently at Stanford University as a visiting professor in civil and environmental engineering.

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More information on the project is at http://depts.washington.edu/exposure/

More information on volatile organic compounds is available from the U.S. Environmental Protection Agency (http://www.epa.gov/iaq/voc.html) and the National Library of Medicine (http://toxtown.nlm.nih.gov/text_version/chemicals.php?id=31)

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For Immediate Release
Aug. 24, 2011

Scented laundry products emit hazardous chemicals through dryer vents

The same University of Washington researcher who used chemical sleuthing to deduce what's in fragranced consumer products now has turned her attention to the scented air wafting from household laundry vents.

Findings, published online this week in the journal Air Quality, Atmosphere and Health, show that air vented from machines using the top-selling scented liquid laundry detergent and scented dryer sheet contains hazardous chemicals, including two that are classified as carcinogens.

"This is an interesting source of pollution because emissions from dryer vents are essentially unregulated and unmonitored," said lead author Anne Steinemann, a UW professor of civil and environmental engineering and of public affairs. "If they're coming out of a smokestack or tail pipe, they're regulated, but if they're coming out of a dryer vent, they're not."

The research builds on earlier work that looked at what chemicals are released by laundry products, air fresheners, cleaners, lotions and other fragranced consumer products. Manufacturers are not required to disclose the ingredients used in fragrances, or in laundry products.

For the new study, which focuses on chemicals emitted through laundry vents, researchers first purchased and pre-rinsed new, organic cotton towels. They asked two homeowners to volunteer their washers and dryers, cleaned the inside of the machines with vinegar, and ran full cycles using only water to eliminate as much residue as possible.

At the first home, they ran a regular laundry cycle and analyzed the vent fumes for three cases: once with no products, once with the leading brand of scented liquid laundry detergent, and finally with both the detergent and a leading brand of scented dryer sheets. A canister placed inside the dryer vent opening captured the exhaust 15 minutes into each drying cycle. Researchers then repeated the procedure with a different washer and dryer at a second home.

Analysis of the captured gases found more than 25 volatile organic compounds, including seven hazardous air pollutants, coming out of the vents. Of those, two chemicals – acetaldehyde and benzene – are classified by the Environmental Protection Agency as carcinogens, for which the agency has established no safe exposure level.

"These products can affect not only personal health, but also public and environmental health. The chemicals can go into the air, down the drain and into water bodies," Steinemann said.

The researchers estimate that in the Seattle area, where the study was conducted, acetaldehyde emissions from this brand of laundry detergent would be equivalent to 3 percent of the total acetaldehyde emissions coming from automobiles. Emissions from the top five brands, they estimate, would constitute about 6 percent of automobiles' acetaldehyde emissions.

"We focus a lot of attention on how to reduce emissions of pollutants from automobiles," Steinemann said. "And here's one source of pollutants that could be reduced."

The project's website also includes letters from the public reporting health effects from scented consumer products. Steinemann says that people's reports of adverse reactions to fragranced air coming from laundry vents motivated her to conduct this study.

Steinemann recommends using laundry products without any fragrance or scent.

Co-authors are Lisa Gallagher and Amy Davis at the UW, and Ian MacGregor at Battelle Memorial Institute.

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For more information, contact Steinemann at acstein@uw.edu. She is best reached via email.

More information about the research, including a copy of the article, is at http://depts.washington.edu/exposure/