IHSA

CAUSATIVE AGENT: PRESERVATIVES

SKIN ALLERGEN, SKIN IRRITANT, LUNG SENSITIZER

DEFINITION

Compound added to slow or prevent bacterial growth and/or unwanted changes in chemical property; exposure may lead to exposure may lead to skin irritation or allergy as well as lung sensitization (i.e. allergy).

HEALTH EFFECTS

- Allergic contact dermatitis: an allergic reaction of the skin triggered by exposure to a chemical allergen
- Irritant contact dermatitis: a skin rash triggered by over-exposure to water, solvents, friction, or contact with irritating substances (e.g. soaps, detergents)
- Occupational asthma: asthma (i.e. airway obstruction) or the exacerbation of pre-existing asthma resulting from an exposure in the workplace
- Cancer resulting from exposure to carcinogenic compounds

EXAMPLES

- Adhesive
- Anti-freeze
- Asphalt shingles
- Biocides
- Caulking
- Concrete
- Degreaser
- Docks
- Drywall
- Fiber boards
- Flame resistant clothing
- Grout
- Metal working fluids (e.g. coolants, cutting oils, drilling fluids, lubricants, machining fluids)
- Moisture barriers
- Paint (e.g. latex paint formulations)
- Rrailroad crossties
- Ripening inhibitors
- Sealant
- Slimicide
- Structural lumber (e.g. fence posts, framing, furring strips, joists, sheathing, sill plates, trusses)
- Utility poles (e.g. power, telephone)
- Vinyl flooring

KEY COMPOUNDS

Review cleaning products' Safety Data Sheets to identify the presence of these compounds. Follow the appropriate precautionary measures.

- Aldehdyes (e.g. acetaldehyde, formaldehyde, glutaraldehyde)
  - Acetaldehyde is classified by the International Agency for Research on Cancer (IARC) as a Group 2B carcinogen
  - Formaldehyde is classified as an IARC Group ıogen
- Alkaline copper quaternary (ACQ)
- Bronopol
- Copper azole (CA)
- Copper carbonate
- Copper napthenate (CN)
- Creosotes
  - Classified as IARC Group 2A carcinogens
- Disodium octaborate tetrahydrate
- Ethylenediaminetetraacetic acid (EDTA)
- Ethylene glycol
- Formaldehyde releasers [e.g. diazolidinyl urea (DIAZ), dimethyloldimethyl (DMDM) hydantoin, imidazolidinyl urea, quternium 15 (Q-15)]
- Hexavalent chromium compounds
  - Classified as IARC Group 1 carcinogens

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KEY COMPOUNDS (CONTINUED)

- Inorganic arsenic compounds [(e.g. ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), chromated copper arsenate (CCA)]
  - Classified as IARC Group 1 carcinogens
- Iodopropynyl butylcarbamate (IPBC)
- Isothiazolinones [e.g. benzisothiazolinone (BIT), methylchloroisothiazolinone (MCI), methylisothiazolinone (MI)]
- Methyldibromoglutaronitrile (MDBGN)
- Naphthalene
  - Classified as an IARC Group 2B carcinogen
- Parabens
- Pentachlorophenol
  - Classified as an IARC Group 1 carcinogen

SECTORS: Construction, electrical & utilities, transportation.

JOBS

Construction

Boilermaker, bricklayer, carpenter, crane operator, elevator constructor, equipment operator, hardwood floor installer/finisher, insulator, iron worker, general labourer, mason, millwright, painter, plasterer, refrigeration/air conditioning worker, rod worker, roofer, sheet metal worker, tile installer, welder, wood worker

Electrical

Electrician, electrical technician, powerline/cable worker

Transportation

Freight loading personnel, hauler, loading dock worker, mariner, train personnel, transport driver

OTHER CONSIDERATIONS

- Some preservatives have workplace exposure limits
- There has been a shift from the traditional "green" pressure-treated lumber to lumber treated with a nano-material based chemical branded "MicroPro Sienna"

HOW COMMON ARE THE HEALTH EFFECTS?

Approximately 63,000 workers in Ontario are exposed to formaldehyde.

Approximately 8,600 workers in Canada are exposed to acetaldehyde and 4,300 to pentachlorophenol.

14.2% of patients with occupational contact dermatitis tested positive for preservative contact allergy.

KEY PREVENTION STRATEGIES

Substitution

- Use mild skin care products (i.e. mild soap for cleansing, mild detergent for industrial cleaning, waterless hand cleanser for oil and grease removal)
- Replace biocide (e.g. chlorine) use with ultraviolet light (UV) technology

Engineering Controls

- Use tools to prevent direct contact with preservatives or products containing preservatives

Administrative Controls

- Provide training on proper glove use (i.e. use cotton liners with nitrile gloves), skin care (i.e. moisturize after hand-washing and throughout the day) and hand washing (i.e. use lukewarm water; avoid hot)
- Rotate workers throughout the work shift to minimize their exposure to preservatives

Personal Protective Equipment

- Use appropriate respirator and gloves (consult manufacturer)
- Avoid gloves made from natural rubber latex (if necessary, use low-protein and powder-free styles)

SOURCES

American Chemistry Council, 2017. Biocides: Critical Preservatives.

CAREX Canada, 2017. Profiles & Estimates.

Infrastructure Health & Safety Association, 2014. Occupational Health Risks: Diagnostic toolkits for physicians and primary health providers (No W120).

International Labour Organization, 2018. International Hazard Datasheets on Occupations (HDO).

Schwensen, J.F., Friis, U.F., Menne, T., Flyvholm, M.A., Johansen, J.D., 2017. Contact allergy to preservatives in patients with occupational contact dermatitis and exposure analysis of preservatives in registered chemical products for occupational use. International Archives of Occupational and Environmental Health 90, 319-333.

United States Environmental Protection Agency, 2017. Overview of Wood Preservative Chemicals.