

CAUSATIVE AGENT: CLEANING AGENTS

LUNG IRRITANT, LUNG SENSITIZER, SKIN IRRITANT, SKIN ALLERGEN

DEFINITION

Chemicals used for cleaning, degreasing and disinfection; workers may be exposed by inhalation or skin absorption; exposure may lead to lung irritation or sensitization (i.e. allergy) as well as skin irritation or 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
- Other health effects (e.g. dizziness, headaches, nosebleeds)

EXAMPLES

- Degreasers (i.e. used to remove grease and dirt from parts, equipment, tools, surfaces and materials)
- Drilling fluid
- Surfactant/ tenside
- Conditioner (i.e. wires and felts)
- Lime dust
- Caustic cleaner
- Detergent
- All-purpose cleaner
- Disinfectant
- Antiseptic
- Bathroom cleaner
- Bleaching agent
- Glass cleaner
- Sanitizer

KEY COMPOUNDS

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

- Acids (e.g. acetic, citric, hydrochloric, phosphoric, sulfuric)
 - Strong inorganic acid mists such as sulfuric acid, are classified by the International Agency for Research on Cancer (IARC) as Group 1 carcinogens
- Aldehydes (e.g. acetaldehyde, formaldehyde, glutaraldehyde)
 - Acetaldehyde is classified as an IARC Group 2B carcinogen
 - Formaldehyde is classified as an IARC Group 1 carcinogen
- Alkaline agents (e.g. ammonium hydroxide, carbonates, hypochlorite, monoethylamine, sodium hydroxide, sodium silicate, silicates)
- Chlorine-releasing compounds (e.g. chloramine)
- Complexing agents [e.g. ethylene diamine triethylene tetramine (EDTA), nitrilotriacetic acid (NTA)]
- Fragrance
- Glycol ethers (e.g. 2-butoxyethanol)
- Hydrogen peroxide
- Methyl bromide
- Perchloroethylene
 - Classified as an IARC Group 2A carcinogen
- Polyethylene
- Quaternary ammonium compounds (e.g. benzalkonium chloride)
- Sodium lauryl ether sulfate
- Toluene
- Tributyltin oxide

CAUSATIVE AGENT: CLEANING AGENTS

SECTORS

Forestry, mining, pulp and paper.

JOB

Forestry

Mechanic, cleaner/custodian, field technician, camp cook

Mining

Dryman/drywoman (i.e. mine janitor), cleaner/custodian, labourer, mechanic, sample preparation technician, derrickman, miner (surface and underground), oiler, service crew, camp attendant, cook

Pulp and Paper

Cleaner/custodian, conveyer cleaner, maintenance technician, mill operator, screen cleaner

OTHER CONSIDERATIONS

Even workers with little or no exposure to irritants can develop hand dermatitis as a result of prolonged friction associated with manual work.

HOW COMMON ARE THE HEALTH EFFECTS?

The prevalence of hand dermatitis among cleaning workers was 28% compared to 18% in the control group.

KEY PREVENTION STRATEGIES

Substitution

- Use products with fewer sensitizers and irritants such as certified “green cleaners” (i.e. products that are nontoxic in their undiluted form, non-corrosive, non-carcinogenic, and do not contain heavy metals or ingredients that can cause lung or skin effects)
- Use products that can be poured and wiped rather than sprayed

Engineering Controls

- Increase ventilation (i.e. open windows and/or doors after cleaning products have been used for approx. 1 hour; improve local or general ventilation systems)
- Use tools to prevent direct contact with cleaning agents or surfaces that have been treated

Administrative Controls

- Follow manufacturers’ directions (i.e. dilution ratio of cleaning solution to water)
- Avoid mixing products
- Use the lowest necessary concentration or amount
- Clean work areas when they are least occupied (i.e. after regular working hours)
- Train employees on good housekeeping practices (i.e. wet sweeping or vacuuming)

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)

CAUSATIVE AGENT: CLEANING AGENTS

SOURCES

Bauer, A., 2013. Contact dermatitis in the cleaning industry. *Current Opinion in Allergy and Clinical Immunology* 13, 521–524.

Brun, E., 2009. The occupational safety and health of cleaning workers. European Agency for Safety and Health at Work (EU-OSHA).

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

McStowe, H., 2017. Occupational and environmental health: recognizing and preventing disease and injury. Oxford University Press.

Mirabelli, M.C., Vizcaya, D., Martí Margarit, A., Antó, J.M., Arjona, L., Barreiro, E., Orriols, R., Gimenez-Arnau, A., Zock, J.-P., 2012. Occupational risk factors for hand dermatitis among professional cleaners in Spain. *Contact Dermatitis* 66, 188–196.

The National Institute for Occupational Safety and Health (NIOSH), 2012. Protecting Workers Who Use Cleaning Chemicals (No. 2012–126).

Workplace Safety & Prevention Services/Occupational Health Clinics for Ontario Workers Inc., 2010. Work-related Asthma and You: Cleaning Products.