

# Right to Know About Chemical Hazards and Safety

Chemicals in the workplace can pose a wide range of health and safety hazards to health care workers — from skin and respiratory irritation to carcinogenic exposures. Workers have the right to know about workplace chemical exposures and protective measures.

See this resource for more information on cleaning and disinfection for the monkeypox virus (MPV) [nnu.org/monkeypox-cleaning-and-disinfection](https://nnu.org/monkeypox-cleaning-and-disinfection).

## **ARE CLEANING AND DISINFECTION AGENTS HAZARDOUS TO MY HEALTH?**

Several commonly used cleaning and disinfection agents can cause harmful health effects. For example, quaternary ammonium compound-based disinfectants (“QACs” or “quats”) are commonly used in hospitals to disinfect floors, walls, and furniture. While quaternary ammonium products are effective against most pathogens,<sup>1</sup> they are associated with both acute and chronic health effects. Acute exposure to quats can lead to eye, nose, throat, or lung irritation, while chronic exposure can lead to dermal irritation that may lead to skin sensitization and asthma.<sup>2</sup>

In a cohort of nurses, occupational exposure to cleaning products and disinfectants was significantly associated with a 25 to 38 percent increased risk of developing chronic obstructive pulmonary disease, independent of asthma and smoking.<sup>3</sup>

Safe handling and wearing appropriate personal protective equipment (PPE) are important measures to prevent health impacts from using cleaning and disinfecting agents in the workplace.

## **WHAT ARE MY RIGHTS TO KNOW ABOUT CHEMICAL HAZARDS AND SAFETY AT MY WORKPLACE?**

Nurses and other health care workers have the right to know what chemicals are present in the workplace, the hazards associated with these chemicals, and protective measures needed to prevent adverse health effects from exposure.

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Under OSHA's Hazard Communication Standard [29 CFR § 1910.1200], also known as the "Right to Know" law, health care employers are legally obligated to:<sup>4</sup>

- » Implement and maintain a written, comprehensive hazard communication program, which includes:
  - › An inventory of hazardous chemicals present in the workplace.
  - › How the employer will inform workers of the hazards associated with chemicals and how to prevent or reduce exposures.
- » Ensure all chemical containers in the workplace are labeled with the following information:
  - › Name of the chemical as listed on the safety data sheet (SDS, see below for more information on SDSs).
  - › Name and contact information of the chemical manufacturer.
  - › Specific warnings on the potential hazards must be prominently displayed.
  - › Note that the Hazard Communication Standard does not apply to drugs or devices that are regulated by the U.S. Food and Drug Administration (FDA).
- » Maintain safety data sheets (SDSs) on all units that use or store chemicals. SDSs must be readily accessible to all health care workers during each work shift.
- » Train health care workers on:
  - › Employers must inform health care workers of any operation in their work area where hazardous chemicals are present and exposure is likely to occur.
  - › Location and availability of the written hazard communication program must be provided.
  - › Employers must inform health care workers of the adverse effects of chemical hazards, protective measures for safe handling and use of chemicals (e.g., ventilation, PPE), emergency and first aid procedures at the time of initial job assignment and whenever a new hazard is introduced.

## WHAT ARE SAFETY DATA SHEETS?

Safety data sheets communicate important hazard and safety information about chemical products that are present in the workplace. Chemical manufacturers and importers are required to develop SDSs for each chemical or product they produce. SDSs contain vital information about the physical and chemical properties of the product and associated hazards, first aid measures, disposal considerations, and more.

## HOW DO I FIND THE SDSs FOR MY UNIT/WORKPLACE?

There are three main ways you can find SDSs for chemicals used on your unit:

- » Under OSHA's Hazard Communication Standard, health care employers are legally required to maintain SDSs for each hazardous chemical and ensure that they are readily accessible to nurses and other health care workers. Health care employers may keep SDSs in a binder or post them on the intranet so long as workers have immediate access to the SDSs without leaving their work area and that access to the information is possible in the event of a power outage or other emergency.

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- » SDSs can also be obtained directly from the chemical manufacturer or distributor website or through the following SDS service websites:
  - › Millipore Sigma (formerly Sigma-Aldrich) <https://www.sigmaaldrich.com/US/en>.
  - › Fisher Scientific <https://www.fishersci.com/us/en/catalog/search/sdshome.html>.
  - › Chemical Safety's Online SDS Database <https://chemicalsafety.com/sds-search/>.
- » SDSs can also be accessed via an internet search by typing the chemical product name, colon, SDS. For example, to find the SDS for Purell hand sanitizers, type "Purell: SDS" in the search engine.

## HOW DO I READ AN SDS?

Information on an SDS is organized into 16 sections, which are divided into four major areas.<sup>5</sup>

- » Sections 1 - 3 provide answers to what the chemical is and what information is needed immediately in the event of an emergency.
- » Sections 4 - 6 provide recommendations on what actions should be taken if a hazardous exposure occurs.
- » Sections 7 - 11 provide answers to routes of exposure and appropriate measures to prevent or minimize worker exposure (e.g., engineering controls and PPE).
- » Sections 12 - 16 provide other useful information such as environmental, disposal, and transportation considerations. Sections 12 - 15 may be included but are not mandated by OSHA.

## EXAMPLE READING OF AN SDS

Below is an overview of what each section contains with language excerpted from a Super Sani-Cloth Germicidal Wipes safety data sheet as an example. (See Table 1.) View PDI's SDS for Sani-Cloth Super at <https://pdihc.com/wp-content/uploads/2018/08/SDS-0020-00-English-1.pdf>.



Image source: PDI <https://pdihc.com/products/environment-of-care/super-sani-cloth-germicidal-disposable-wipe/>.

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**TABLE 1. Super Sani-Cloth Germicidal Wipes safety data sheet**

**SECTION 1 – Chemical product name**

The product name on the label must match the name on the safety data sheet. This section must also include information on recommended use of the chemical and restrictions on use, and the manufacturer’s emergency contact information. For example:

- » Product name: Super Sani-Cloth Germicidal Wipes
- » Recommended use: Use as a disinfectant on hard, non-porous surfaces. Read and understand the entire label before using. Use only according to label directions. It is a violation of Federal law to use this product in a manner inconsistent to label directions.
- » Restrictions on use: For professional and hospital use
- » Emergency Telephone: 1-800-633-8253 (Domestic/Canada)

**SECTION 2 – Hazard(s) identification**

This section provides an overview of the physical and health hazard risks associated with using the product and important precautionary statements. Signal words such as danger or warning are also provided to heighten awareness of risk. For example:

- » Hazard statements: Causes serious eye irritation, may cause drowsiness or dizziness, flammable liquid, and vapor
- » Precautionary statements and response: Use personal protective equipment as required. Use outdoors or in a well-ventilated area. Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
- » IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing if eye irritation persists: Get medical advice/attention
- » IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- » In case of fire: Use CO2, dry chemical, or foam for extinction

**SECTION 3 – Hazardous ingredients**

The chemical composition or ingredients of the product must be listed, including its concentration.

- » Ingredients: Isopropyl alcohol; quaternary ammonium compounds, C12-18-alkyl [(ethylphenyl) methyl] dimethyl, chlorides; n-Alkyl Dimethyl Benzyl Ammonium Chloride

**SECTION 4 – First aid measures**

This section provides advice on immediate, first aid measures that should be given to the exposed worker. The most important symptoms and health effects of exposure are also listed. For example:

- » General advice: IF exposed or concerned – Get medical advice/attention. Show this safety data sheet to the doctor in attendance.
- » Ingestion: Do not induce vomiting unless directed to do so by a medical professional. Clean mouth with water and drink plenty of water afterwards. Never give anything by mouth. If victim is unconscious or is convulsing, call a physician.
- » Symptoms: Burning sensation. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea, and vomiting

**SECTION 5 – Fire and explosion data**

Information regarding the flammability of the product and recommendations for extinguishing a fire caused by the chemical are contained in this section. For example:

- » Suitable extinguishing media: Dry chemical. Carbon dioxide. Water spray. Alcohol resistant foam.
- » Specific hazards arising from the chemical: Risk of ignition. Keep product and empty container away from heat and sources of ignition.

**SECTION 6 – Accidental release measures**

This section provides recommendations for what actions to take in the event of a chemical spill or leak, including methods for containment and cleanup to prevent or minimize exposure to people and the environment. For example:

- » Personal precautions: Evacuate personnel to safe areas. Use PPE as required. Eliminate all ignition sources (no smoking, flares, sparks or flames in the immediate area). Pay attention to flashback.
- » Methods for cleaning up: Take precautionary measures against static discharges. Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

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## SECTION 7 – Handling and storage

Guidance on safe handling practices and conditions for safe storage of the product, including any chemical incompatibilities, is provided in this section. Incompatible chemicals stored together could react and cause a fire or explosion or release toxic gases and fumes. For example:

- » Advice on safe handling: Avoid contact with eyes and skin. Handle in accordance with good industrial hygiene and safety practice. Avoid breathing vapors. Ensure adequate ventilation.
- » Storage conditions: Store in a cool, dry location away from incompatible materials. Do not store near heat or open flame. Do not freeze or expose to extreme cold for a long period.

## SECTION 8 – Exposure controls and PPE

This section provides information on workplace exposure limits, engineering controls, and appropriate PPE measures to prevent or minimize worker exposure. Workplace exposure limits are enforceable, regulatory values set by OSHA, which indicate the permissible amount or concentration of a substance in the air, for a length of time (usually 8 hours). For example:

- » Exposure limits: Isopropyl alcohol OSHA PEL 400 ppm
- » Engineering controls: Showers, eyewash stations, ventilation systems
- » Respiratory protection: No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

## SECTION 9 – Physical and chemical properties

The chemical characteristics of the product are detailed in this section, including what it looks and/or smells like, how volatile it is and other information. Do not use the product if it does not appear like the SDS description. For example:

- » Physical state: Liquid
- » Appearance: Colorless to slightly yellow liquid saturated on a wipe.
- » Odor: Alcohol
- » Flammability (solid, gas): No data available

## SECTION 10 – Stability and reactivity

This section provides information on how stable the product is and the possibility of hazardous reactions which might occur during use, storage, or transportation of the product.

- » Reactivity: No information available
- » Conditions to avoid: Heat, flames, and sparks

## SECTION 11 – Toxicological information

This provides information on the routes by which a chemical can come into contact with or enter the body, adverse health effects from both acute and chronic exposure, and related symptoms. For example:

- » Inhalation: Specific test data for the substance or mixture is not available. May cause irritation of respiratory tract. May cause drowsiness or dizziness. May be harmful if inhaled.
- » Symptoms: May cause redness and tearing of the eyes. Inhalation of high vapor concentrations may cause symptoms like headaches, dizziness, tiredness, nausea and vomiting.

## SECTION 12 – Ecological information (non-mandatory)

OSHA does not enforce this section which provides information to evaluate the environmental impact of the chemical(s) if it is released into the environment. For example:

- » Persistence and degradability: No information available

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### SECTION 13 – Disposal considerations (non-mandatory)

OSHA does not enforce this section which provides directions on how to safely and properly dispose of the product, including waste from residues and contaminated packaging. For example:

- » Waste treatment methods: Should not be released into the environment. Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

### SECTION 14 – Transport information (non-mandatory)

OSHA does not enforce this section which provides information related to the transport of the product by road, air, rail, or sea.

### SECTION 15 – Regulatory information (non-mandatory)

OSHA does not enforce this section which contains regulatory information specific for the product not indicated anywhere else on the SDS.

- » U.S. EPA Label Information: Keep Out of Reach of Children. WARNING. Precautionary statements. Hazards to humans and domestic animals.
- » EPA Pesticide Registration Number 9480-4

### SECTION 16 – Other information

This provides information on when the SDS was prepared or when it was last revised. For example:

- » Issuing Date: 18-Feb-2019
- » Revision date: 03-Jun-2020

## ENDNOTES

- 1 Massachusetts Toxics Use Reduction Institute, “Quaternary Ammonium Compounds Fact Sheet,” Nov 2021, [https://www.turi.org/TURI\\_Publications/TURI\\_Chemical\\_Fact\\_Sheets/Quaternary\\_Ammonium\\_Compounds\\_Fact\\_Sheet](https://www.turi.org/TURI_Publications/TURI_Chemical_Fact_Sheets/Quaternary_Ammonium_Compounds_Fact_Sheet) (Accessed August 25, 2022).
- 2 Massachusetts Toxics Use Reduction Institute, “Health and Environmental Impacts,” Nov 2021, [https://www.turi.org/TURI\\_Publications/TURI\\_Chemical\\_Fact\\_Sheets/Quaternary\\_Ammonium\\_Compounds\\_Fact\\_Sheet/Health\\_and\\_Environmental\\_Impacts](https://www.turi.org/TURI_Publications/TURI_Chemical_Fact_Sheets/Quaternary_Ammonium_Compounds_Fact_Sheet/Health_and_Environmental_Impacts) (Accessed August 25, 2022).
- 3 Dumas, O., R. Varraso, et al., “Association of Occupational Exposure to Disinfectants With Incidence of Chronic Obstructive Pulmonary Disease Among US Female Nurses,” JAMA, 2019, 2(10): e1913563, doi:10.1001/jamanetworkopen.2019.13563.
- 4 View the full standard at <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1200>.
- 5 29 CFR 1910.1200 App D.