



Healthy Schools Network, Inc.

Sanitizers and Disinfectants Guide

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GOOD NEWS

Sanitizers and disinfectants can play an important role in protecting public health. They are designed to kill “pests,” including infectious germs and other microorganisms such as bacteria, viruses, and fungi.



BAD NEWS

Unfortunately, sanitizers and disinfectants also contain chemicals that are “pesticides.” Exposure to persistent toxic chemicals in pesticides can cause serious health problems.

Healthy Schools Network, Inc. (HSN) recommends schools follow all public health laws and regulations regarding the use of sanitizers and disinfectants in schools, and proceed with extreme caution when using any chemicals around children or staff. If the law does not require a chemical use, schools should conduct a thorough analysis of the potential risk of introducing another chemical cleaning product into the school environment. The purpose of this Guide is to provide basic information about the use of sanitizers and disinfectants.

(Underlined words are defined in the Glossary on page 4.)

How ‘Toxic’ is Toxic?

A chemical is toxic if it can cause harm to humans or the natural environment. Some chemicals are more harmful, depending on how strong they are, and whether or not they are persistent. The US EPA must register sanitizers and disinfectants before they can be placed on the market for sale. Registration, however, does not assure safety.

Children Are At Greater Risk

Children are especially vulnerable to toxic chemical exposure. They can be exposed in the following ways:

- **Inhalation:** Children breathe more air per pound of body weight than adults. Toxic vapors or fumes can cause breathing problems, or be absorbed into the bloodstream.
- **Skin contact:** Children are less able to identify and avoid hazards, and have immature systems that may not detoxify poisons. Residues from chemicals can damage skin and eyes by burning tissue, or be absorbed through the skin and carried to body organs.
- **Ingestion:** Children play on the floor or ground, drink or eat chemicals through hand-to-mouth touch, or can lick off a surface, such as a toy or a desktop.

Sanitizing and Disinfecting in Schools

Requirements

- Federal law requires schools to follow all applicable state and local laws and regulations for proper sanitation and health.
- New York State regulations require sanitization of food service areas only. Aside from this, there are no New York laws that require sanitizing or disinfecting in schools. Despite this, some schools apply or misapply sanitizers or disinfectants in other areas in the school building.
- The federal Occupational Safety and Health Administration (OSHA) Bloodborne Pathogen (BBP) regulations require a special cleanup strategy (including the use of an EPA-registered disinfectant) to protect employees when Hepatitis- or HIV-contaminated blood or other bodily fluids may be present. This most often occurs in emergency or first-aid situations. Schools must still follow OSHA/BBP when, for example a fight, playground/sports injury, or illness results in bleeding or vomiting.

2012 Update: In California, the Child Care Licensing regulations mandate sanitizing and disinfecting facilities for infection control. The San Francisco Asthma Task Force, an organization founded by the San Francisco Board of Health in 2001 to tackle the asthma epidemic through primary prevention, recommends equally-effective, alternatives for sanitizing and disinfecting which are bleach-free and still meet licensing regulations. These products may also be less toxic to children and are less irritating to asthmatic individuals.

Common Sense Strategies

- Thorough, routine frictional cleaning of surfaces is an extremely effective strategy for protecting building occupant health.
- The maintenance of healthy and safe buildings is a challenge. Before a school goes beyond legal requirements and routinely use sanitizers or disinfectants, these products should be selected carefully and used exactly according to label directions to achieve the best possible results, while protecting people—especially children—from harmful chemical exposure.

Commonly Used Sanitizers and Disinfectants

The following chemicals are the active ingredient in many sanitizers and disinfectants. Some products are sold as concentrates, which can be highly toxic and should be used with extreme caution. The level of toxicity will depend upon how much they are diluted. Some chemicals are persistent, no matter how much they are diluted.

- **Phenol Compounds or Carbolic Acid:** Used mostly in industrial disinfectant products they are also purchased by schools. Fatal poisoning can occur through skin absorption. Ingestion of small even small amounts may cause vomiting, circulatory collapse, paralysis, convulsions and induce comas. Exposure to vapors or fluids commonly causes light sensitivity and sinus congestion. Skin contact can result in severe burns, skin ulcerations, rashes, swelling, pimples and hives.
- **Sodium Hypochlorite - Chlorine Bleach:** Used in many disinfectant products, especially those designed to remove mold and mildew. Only a limited number of products registered with the US EPA contain sodium hypochlorite. It is a respiratory irritant and can trigger asthma attacks. Chlorine can burn eyes and skin, and if it is mixed with other cleaners such as ammonia, it will produce a deadly gas. When chlorine mixes with other organic materials, it can produce dioxins and furans—the most toxic chemicals known — which are persistent in the environment and bioaccumulate in living tissue.
- **Quaternary Ammonia Compounds – QUATS:** When these compounds are properly diluted they are non-staining and non-corrosive to most surfaces. QUATS are irritating to the eyes and skin. Products using 1% of certain Quats as their active ingredient are considered toxic to aquatic life.
- **Isopropyl alcohol – Isopropanol:** This is the most common form of alcohol used for cleaning compounds. It must be at a concentration of 60 to 90% to be effective in killing germs. This is a highly flammable chemical and can burn and irritate the eyes. It is moderately toxic to humans by skin contact; drinking or breathing can cause headaches, dizziness, hallucinations, shortness of breath, nausea, vomiting, and coma.
- **Pine Oil:** This naturally occurring oil derived from pine trees is considered old technology, but it is still used today. As a disinfectant, it is weak, and an 80% solution (8 quarts of pine oil to 2 quarts of water) would be needed to kill germs. In its pure form, it can cause eye and skin irritation to eyes and it is moderately flammable.
- **Hydrogen Peroxide:** Highly concentrated forms of hydrogen peroxide can be irritating to the eyes and skin. Hydrogen peroxide is a sanitizer found in cleaning products that also contain detergents and other ingredients such as citrus oils because they effectively clean soiled surfaces. (*The hydrogen peroxide sold in drug stores as an antiseptic should not be used as a cleaning product.*)



GERM REDUCTION AND PESTICIDE EXPOSURE PREVENTION CHECKLIST

1. Prevention:

- Keep dirt out of the building and under control.
- Clean often and carefully.
- Encourage frequent handwashing among students and staff.

2. Think carefully before using a disinfectant product:

- Evaluate areas most often touched by people.
- Thoroughly clean* these surfaces to remove dirt, spills, finger marks, etc.
- Re-evaluate the need to sanitize or disinfect: *cleaning may be sufficient*.
- If you choose to use a toxic product, follow the directions on the label exactly (see #3 below).
- Do not use toxic products when children are present.
- Remember: a surface must be thoroughly cleaned *before* a sanitizer or disinfectant is applied, otherwise the product may not be fully effective. Allow time for the sanitizer or disinfectant to react--make sure it is used when people will not be using the surface until the reaction has occurred and the toxins have dissipated.
- Make sure the area is well ventilated while the product is being used and before the area is reoccupied, especially by children.

3. Read labels, check Materials Safety Data Sheets (MSDS) and ask:

- What is the “active ingredient?”
- Is it designed to kill the target germs or other organisms?
- Is there a safer alternative that will do the job with minimal risk of toxic exposure?
- Has the staff been trained to use the product in a manner that is protective of children?
- Will it damage the surfaces cleaned with it?

4. Other tips:

- If using a product from concentrate, make sure it is diluted properly. Measure accurately and use proper equipment.
- Use the smallest amount of the product possible to achieve the intended result.
- Sanitizers and disinfectants should be stored safely and disposed of in an environmentally safe manner.

GLOSSARY

- **Microbes** - Microorganisms such as bacteria, germs and viruses.
- **Active Ingredient** - The ingredient that kills the target organism.
- **Toxic** - Refers to chemicals that can cause harm to humans or animals.
- **Hazardous** - Refers to chemicals that are dangerous.
- **MSDS** - Material Safety Data Sheets are the manufacturer's summary of the potential hazards of a product. They include information on health effects, safe use, handling and storage, etc. *For more information on MSDS, call the Healthy Schools Network.*
- **Disinfectant** - A product designed to kill microbes.
- **Sanitizer** - A product designed to reduce the amount of microbes.
- **Sterilizer** - A product designed to kill all microbes; for example, in a hospital.
- **Frictional Cleaning** - Cleaning while rubbing vigorously.
- **Persistent Toxic Chemical** - A chemical that remains in the environment and causes harm to humans and animals.
- **USEPA** - United States Environmental Protection Agency.

SOURCES AND RESOURCES

EcoLogo, third-party certification of environmentally preferable products, including disinfectants, http://www.ecologo.org/en/certifiedgreenproducts/details.asp?product_type_id=268

Healthy Schools Network, "Guide to Green Cleaning", <http://healthyschools.org/clearinghouse.html>

National Collaborative Work Group on Green Cleaning and Chemical Policy Reform in Schools, information and tool kit for green cleaning in schools, <http://www.cleaningforhealthyschools.org/>

New York State Office of General Services, green cleaning training materials and resources, <http://greencleaning.ny.gov/>

San Francisco Asthma Task Force, updates and resources from the Task Force, <http://www.sfgov3.org/index.aspx?page=695>

US Environmental Protection Agency, information and resources on pesticides, <http://epa.gov/pesticides/>

Centers for Disease Control, guidance on cleaning and disinfecting after an outbreak, <http://www.cdc.gov/mrsa/environment/>



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