Safer Cleaning and Disinfecting: Information for Manufacturers and Other Businesses

As Massachusetts businesses reopen, they face the need to clean and disinfect to prevent COVID-19 transmission. Certain cleaning and disinfecting chemicals have been linked to acute and chronic illnesses, including asthma. However, safer alternatives are available. This fact sheet provides some key guidelines for safer cleaning and disinfecting, as well as information on how to use disinfectants effectively in manufacturing and other business facilities.

Note: This fact sheet is designed as a supplement to guidance from authoritative sources. For detailed guidance for manufacturers and other business facilities, please see resources from the Centers for Disease Control (CDC), the US Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the Massachusetts Department of Public Health (MassDPH).

NEVER MIX CLEANING CHEMICALS

NEVER mix chemicals together when cleaning and disinfecting. Mixing chemicals together can cause very dangerous reactions. For example, bleach is a highly reactive and can cause dangerous byproducts when combined with other chemicals. If bleach and ammonia are mixed together, they produce toxic gases that can be lethal. Mixing bleach with hydrogen peroxide or vinegar is also dangerous. For more information, see TURI's web page on the dangers of mixing cleaning chemicals.

CLEAN AND DISINFECT EFFECTIVELY

Disinfectants are effective only when used as directed and after cleaning. It is important to review the manufacturer's labels and technical data sheets (TDS) before use. Use the EPA Pesticide Product and Label System to find labels for any disinfectant product registered by EPA, using the EPA registration number or product name. This resource provides hazard information, directions for use, storage, and other information. Contact the vendor for any further questions on use.

Clean before disinfecting. Disinfectants are not cleaners. Surfaces must be cleaned before disinfecting. Otherwise, the disinfectant may not come into direct contact with viruses and bacteria. Clean the surface with soap and water or another appropriate cleaner before applying any disinfectant.

Use cleaning cloths correctly. Use separate cloths for the cleaning step and the disinfecting step. Place the cloth immediately in a laundry receptacle after cleaning and disinfecting to avoid potential cross-contamination.

DEFINITIONS

Cleaning: the removal of foreign material (e.g., soil and organic material) from surfaces and objects, normally accomplished with detergents or soaps. Cleaning is required **prior** to disinfection.

Disinfection: a process that is used to reduce the number of viable microorganisms on a surface but that may not necessarily inactivate all microbial agents.

Sanitizing: a process that reduces (but does not necessarily eliminate) microorganisms to levels considered safe, as determined by public health codes or regulations. Sanitizers include food-contact and non-food-contact products.

Sterilization: a validated process used to render a surface or instrument free from all viable microorganisms.

Sources: *Cleaning for Healthier Schools- Infection Control Handbook* (2010) and CDC's glossary

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Using a high-quality microfiber cloth helps to capture and remove more microbes from nonporous surfaces and objects.[1]

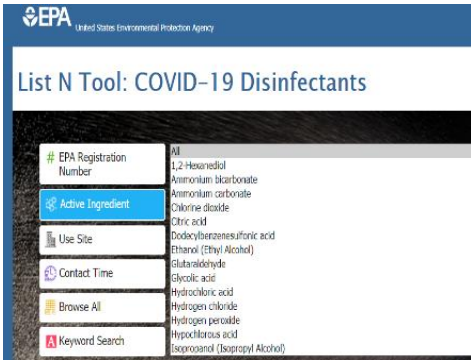
Choose the right product for each surface type. Most disinfectants are designed for use on hard, non-porous surfaces, such as faucet handles and doorknobs. Soft, porous surfaces such as fabrics, towels, and rags can generally be cleaned in a washing machine. Based on CDC's Cleaning and Disinfection for Households guidance, and CDC's Cleaning and Disinfecting Your Facility guidance, washing with soap and warm water are effective.

Determine and use the required dwell time. Dwell time, or contact time, is the amount of time a disinfectant product must remain wet on a surface in order to properly disinfect. **It is critical to follow the dwell times noted on the product label. Otherwise, the surface will not be effectively disinfected.** Dwell times may vary depending on target microbes, and surface types, and may range from 30 seconds to over 10 minutes. It is important to choose a disinfectant that fits the daily tasks of the users and to allow the proper dwell time before continued use of the surface.

Check the product's shelf life. Check the product label for expiration dates and shelf life after opening. Many products have a one- to two-year shelf life if unopened, and a shorter lifespan after opening. For example, products with the active ingredient hydrogen peroxide will need to be used within six months of opening. Keep track of when a product was opened by writing the date it was opened directly onto the bottle.

Follow storage instructions. Some products may last longer when stored in darker bottles or at certain temperatures. If disinfecting or cleaning products are stored with other chemicals, be sure they are compatible. Also consider flammability of products when storing (i.e. use a flammables cabinet when necessary). For example, isopropyl alcohol is flammable.

CHOOSE DISINFECTANTS WITH SAFER ACTIVE INGREDIENTS



Screenshot of EPA's List N Tool

According to EPA's Safer Choice program (formerly known as Design for Environment), safer active disinfectant ingredients include **hydrogen peroxide**[2], **alcohol** (isopropyl alcohol or ethanol), **citric acid**, and **lactic acid**, among others. EPA's "List N" provides information on all the disinfection products that meet EPA's criteria for effectiveness against COVID-19. Within this list, it is possible to search for products that contain safer active ingredients. To find a disinfection product with safer active ingredients on EPA's List N, go to the List N Tool page and choose the option to search by active ingredient. TURI's cleaning laboratory has also created a sample list of products that contain safer active ingredients. Massachusetts state government entities have the option to use the Environmentally Preferable Products (EPP) Procurement Program to find and purchase safer cleaning and disinfection products.

[1] Toxics Use Reduction Institute (TURI). Cleaning for Healthier Schools - Infection Control Handbook. 2010.

[2] **Note:** According to the Association of Occupational and Environmental Clinics (AOEC) the combination of hydrogen peroxide and peroxyacetic acid (peracetic acid) has caused the initial onset of asthma in some individuals while triggering asthma symptoms in others. **Avoid** products that contain the combination of these ingredients.

SAFER HANDLING OF CLEANERS AND DISINFECTANTS

It is essential to follow safety directions and minimize exposure, even when using safer chemicals. Elements of safer handling include the following:

Train staff on the dangers of mixing chemicals and provide information on emergency procedures in case of accidental chemical mixing. It is also important to train staff on how to interpret product labels and safety data sheets (SDSs) for personal protective equipment (PPE) recommendations, as well as directions for use. TURI has created a resource on finding information about chemical hazards in SDSs and other resources.

Provide staff with appropriate PPE, including gloves, eye protection, and respirators. Open windows and turn on exhaust fans to ensure adequate ventilation.

Follow manufacturer recommendations for dilutions, product use, and safe handling. This is especially important when using bleach (sodium hypochlorite). Bleach must be diluted with water ONLY before use. Bleach is highly toxic and can cause respiratory, skin and eye irritation, and can cause or exacerbate asthma.

Avoid overuse of disinfectants. Disinfectants are pesticides. Despite the importance of disinfecting to control COVID 19 exposures, disinfectants also pose concerns, including contributing to antibiotic resistant strains of pathogens. Always clean before disinfecting in order to minimize disinfectant use and maximize effectiveness. Focus on disinfecting high-use areas such as doorknobs and light switches.

Key questions for managers to consider

What surfaces need disinfection?

What is the schedule for disinfection?

Are least toxic and most effective products being used?

Who will do the disinfecting? If using an outside vendor, what are their procedures?

What information, training, and PPE do personnel need?

How will personnel be protected during the process?

How will disinfectants be managed?

How will disinfectants be disposed?

ADDITIONAL RESOURCES

TURI COVID-19 safer cleaning and disinfecting guidance and resources

MassDPH COVID-19 safety standards and checklist for reopening of Massachusetts manufacturers

CDC's recommendations for cleaning and disinfecting for households for COVID-19

CDC's recommendations for cleaning and disinfecting facilities

University of Washington safer cleaning, sanitizing, and disinfecting strategies fact sheet

TURI chemicals and asthma fact sheet

Environmental Working Group guide to healthy cleaning, list of disinfectants

Massachusetts Environmentally Preferable Products (EPP) Procurement Program

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The Toxics Use Reduction Institute is a multi-disciplinary research, education, and policy center established by the Massachusetts Toxics Use Reduction Act of 1989. The Institute sponsors and conducts research, organizes education and training programs, and provides technical support to help Massachusetts companies and communities reduce the use of toxic chemicals.

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June 2020