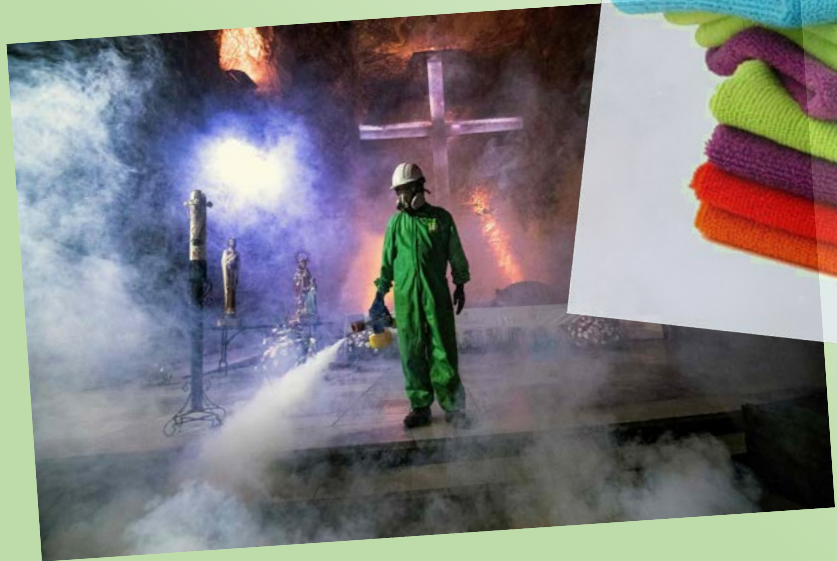


Hygiene theatre or cleaning? What are the hazards and the options?



Dorothy Wigmore, MS
Occupational health
specialist (occupational
hygiene, ergonomics,
“stress”/work organisation)

These days,
it's always:
*“clean and
disinfect”*

Cleaning and disinfecting public spaces including your workplace, school, home, and business will require you to:

- Develop your plan
- Implement your plan
- Maintain and revise your plan

Reducing the risk of exposure to COVID-19 by cleaning and disinfection is an important part of reopening public spaces that will require careful planning. Every American has been called upon to slow the spread of the virus through social distancing and prevention hygiene, such as frequently washing your hands and wearing face coverings. Everyone also has a role in making sure our communities are as safe as possible to reopen and remain open.

The virus that causes COVID-19 can be killed if you use the right products. EPA has compiled a list of disinfectant products that can be used against COVID-19, including ready-to-use sprays, concentrates, and wipes. Each product has been shown to be effective against viruses that are harder to kill than viruses like the one that causes COVID-19.

https://www.cdc.gov/coronavirus/2019-ncov/community/pdf/Reopening_America_Guidance.pdf



But we know that disinfectants are **mis-used and over-used**. They are often prescribed by public health and infectious disease “experts” without considering what else might work, product hazards or consequences. In this pandemic, calls to poison control centres have sky-rocketed.

Hygiene Theater Is a Huge Waste of Time

People are power scrubbing their way to a false sense of security.

July 27, 2020

[Derek Thompson](#)

Staff writer at *The Atlantic*

Finally, and most important, hygiene theater builds a false sense of security, which can ironically lead to more infections. Many bars, indoor restaurants, and gyms, where patrons are huffing and puffing one another's stale air, shouldn't be open at all.

.. Instead, many of these establishments are boasting about their cleaning practices while inviting strangers into unventilated indoor spaces to share one another's microbial exhalations.

I believe that fomites that have not been in contact with an infected carrier for many hours do not pose a measurable risk of transmission in non-hospital settings. A more balanced perspective is needed to curb excesses that become counterproductive.

Exaggerated risk of transmission of COVID-19 by fomites; Emanuel Goldman

(egoldman@njms.rutgers.edu) Professor of Microbiology, Biochemistry and Molecular Genetics, New Jersey Medical School - Rutgers University, Newark, NJ

[https://www.thelancet.com/pdfs/journals/lanif/PIIS1473-3099\(20\)30561-2.pdf](https://www.thelancet.com/pdfs/journals/lanif/PIIS1473-3099(20)30561-2.pdf)

CLEANER, SANITIZER & DISINFECTANT



What are the differences?

Cleaner: Removes germs, dirt, and impurities from surfaces or objects. Soap/detergent, water and friction physically **remove** dirt and germs from surfaces. Effective disinfecting and sanitizing means **cleaning must be done beforehand.**

Sanitizer: Reduces **bacteria** on surfaces to levels considered safe for public health, used as the label directs. Less effective than a disinfectant.

Disinfectant: Destroys almost all infectious germs on a surface, including **viruses**. No effect on dirt, soil, or dust. Must be used at the specific **dilution/concentration** and left **glistening wet** for the full **dwel or contact time**. Label lists all that information, and how it must be applied, including what equipment, if any, can be used.

What about disinfectants?

In the U.S., disinfectants are considered to be pesticides. They must be registered with the EPA.

Labels set by EPA must specify application methods and protective measures.

Data sheets must be provided and workers must be trained.

And every time they're used, antimicrobial resistance likely increases.

.. List N only includes surface disinfectants registered by EPA. Other disinfection products like hand sanitizers and body wipes are regulated the U.S. Food and Drug Administration. Using an EPA-registered product in ways other than what is specified in the label is against the law and unsafe.

<https://www.epa.gov/newsreleases/epa-continues-efforts-help-increase-availability-disinfectant-products-use-against>

Unless the pesticide product label specifically includes disinfection directions for fogging, fumigation, or wide-area or electrostatic spraying, EPA does not recommend using these methods to apply disinfectants. EPA has not evaluated the product's safety and efficacy for methods not addressed on the label.

<https://www.epa.gov/coronavirus/can-i-use-fogging-fumigation-or-electrostatic-spraying-help-control-covid-19>

Avoid being sold a bill of goods, false claims

Foggers and Misters

- System delivers very small droplets
- Passively deposit on surfaces
 - Based on direction of spray
 - Rely on effect of gravity
- May result in uneven coverage
- Reentry times may be delayed
 - Compared to electrostatic spray
- Practical difference between foggers and misters
 - Foggers are used to introduce fog like cloud (10 microns)
 - Misters form rainy environment, produce little droplets (200 microns)



The (Japanese) Ministry of Health, Labor and Welfare's Tuberculosis and Infectious Diseases Control Division stated, "Even if it was effective on objects, misting is not effective, and could be harmful depending on the concentration."

<https://mainichi.jp/english/articles/20200602/p2a/00m/0na/025000c>

What's on the N list?

- 231 quats, with different chemical, some mixed with other chemicals
- 69 sodium hypochlorite products, one with sodium carbonate
- 75 hydrogen peroxide products, 43 on own



List N: Disinfectants for Use Against SARS-CoV-2 (COVID-19)

All products on this list meet [EPA's criteria](#) for use against SARS-CoV-2, the virus that causes COVID-19.

Finding a Product

To find a product, enter **the first two sets** of its **EPA registration number** into the search bar below. You can find this number by looking for the EPA Reg. No. on the product label.

For example, if EPA Reg. No. 12345-12 is on List N, you can buy EPA Reg. No. 12345-12-2567 and know you're getting an equivalent product.

View List N's information in our new tool

#	EPA Registration Number
🌿	Active Ingredient
🏠	Use Site
🕒	Contact Time
📄	Browse All
🔍	Keyword Search

But who hears about those in another EPA programme – about less toxic chemicals?

Chemicals and canaries

- data gaps and “toxic ignorance”, since pre-market testing is not required for most chemicals and chemical products
- most chemicals in commerce today in Canada and the United States have not been tested for long-term effects (e.g., cancer, reproductive harm, damage to other body systems)
- there is a long history of industry denials, delays, and cover-up about chemical hazards (e.g., asbestos, PFAS, isocyanates in SPF)
- workers are often the canaries but the last people we worry about when it comes to toxics (aka late lessons from early warnings)
- regulators use the reactionary principle, deal with regrettable substitutions (e.g., BPA/S; n-hexane brake cleaner)



The Canary Girls were the United Kingdom's female trinitrotoluene (TNT) shell makers of the First World War. They got the nickname as a result of working with TNT, which is toxic. Repeated exposure can turn the skin an orange-yellow colour like a canary (a bird used by miners to detect toxic carbon monoxide in coal mines). Hundreds of "Canary Babies" were born with a slightly yellow skin colour because of the hazards their mothers faced at work. (Wikipedia)

What have researchers found about some “cleaning” product hazards?

Cleaning product	# cases
Unspecified	104
Bleach	43
Acids, bases, oxidizers	23
Disinfectants	20
Carpet cleaner	17
Floor stripper/wax	16
Ammonia	14

Cases of work-related asthma

Rosenman et al (2003) *JOEM* 45(5): 556-63

“Cleaning” ingredients continue to cause respiratory diseases

– for health care workers, cleaning staff, sports staff, teachers, chefs and other kitchen workers, and others

Carder, M., et. al. (2019) “Occupational and work-related respiratory disease attributed to cleaning products”, *Occupational and Environmental Medicine*, 76: 530–536.

Table 1 Number (and percentage) of actual cases of occupational and work-related respiratory disease attributed to cleaning agents (by agent group), reported by chest physicians to SWORD* (1989–2017), occupational physicians to OPRA† (1999–2017) and general practitioners to THOR-GP‡ (2006–2017)

Group	Name	SWORD*	OPRA†	THOR-GP‡
		Total cases (%)		
		1989–2017	1999–2017	2006–2017
1	Caustics including ammonia and alkaline phosphates	21 (3%)	4 (5%)	2 (13%)
2	Acids	39 (6%)	6 (8%)	1 (6%)
3	Chlorine/releasers	167 (24%)	30 (41%)	6 (38%)
4	Chloramines and nitrogen trichloride	27 (4%)	2 (3%)	0
5	Quaternary ammonium	9 (1%)	2 (3%)	0
6	Solvents (organic)	45 (7%)	0	1 (6%)
7	Aldehydes	223 (32%)	11 (15%)	1 (6%)
8	Phenolics	7 (1%)	2 (3%)	0
9	Terpenes	4 (1%)	0	2 (13%)
10	Enzymes	6 (1%)	1 (1%)	0
11	Miscellaneous	27 (4%)	5 (7%)	1 (6%)
12	Unclear	115 (17%)	12 (16%)	2 (13%)
	Total cases§	690 (100%)	73 (100%)	16 (100%)

*Surveillance of Work-Related and Occupational Respiratory Disease.

†Occupational Physicians Reporting Activity.

‡The Health and Occupation Research network in General Practice.

§A case may be attributed to more than one cleaning agent.

Asthma's a big deal for cleaners and those in the spaces where they work

Quats may not be getting as much media attention as triclosan, but a growing number of scientific studies conducted over the past ten years link exposure to quats with adverse respiratory effects, particularly for those who use them professionally. ..“There’s a pretty convincing body of evidence that they are asthmagens,” Pechter says of quats.

[\(Can killing germs be hazardous to your health? Questions about “quats”, 2014\)](#)

Avoid using bleach -- it can harm

Like many disinfectants, bleach is often used unnecessarily as a daily cleaner. Bleach is an asthmagen (which means it may cause asthma) and can make existing asthma worse. It also is corrosive and can damage eyes and skin. Bleach can be fatal if swallowed, gives off a potent vapor, and if mixed with ammonia or acids, can create gases that cause lung damage and death.

[\(Healthy cleaning and asthma-safe schools: A how-to guide, 2014\)](#)

FIGURE 2: WORK-RELATED ASTHMA AND CLEANING PRODUCTS

11% of the California Work-Related Asthma Prevention Program's cases linked their asthma to cleaning products. Of these cases:

20%



1 in 5 worked as a cleaner.

80%



4 of 5 of workers did not clean but were around during cleaning or after cleaning just happened.

Source: [Healthy cleaning and asthma-safe schools: A how-to guide, 2014.](#)

What hazards do cleaning and disinfecting chemicals pose?

Cleaning product chemicals can have **short-term effects**, such as:

- irritating, itchy or burning **eyes**;
- **skin** rashes, allergies and burns;
- **dizziness** and **headaches**;
- **nose bleeds**; and
- sore **throat**, coughing, wheezing, **shortness of breath**.

Studies show that -- depending on the chemical(s) – cleaning product ingredients can :

- cause new cases of **asthma** and trigger asthma attacks;
- harm the **brain, nervous system, reproductive organs, kidneys and liver**;
- cause breathing problems and illnesses;
- disrupt/act like hormones (**endocrine disruptors**);
- lead to **cancer**; and
- be linked to **cardiovascular** (heart) problems.



NIOSH just published some information about disinfectants for viruses

Pharos Search...

Search Pharos

Search for chemicals, common products, functional uses

Try **Benzene** 50-00-0 **surfactant** **roofing**

About Pharos

Pharos provides hazard, use, and exposure information on 164,130 chemicals and 163 different kinds of building products.

Hazard Assessments

Certified GreenScreen assessments in the public domain or for sale.

Hazard Lists

Authoritative scientific lists for health and environmental hazards and restricted substance lists.

Common Products

Common contents and hazards of 163 different kinds of building products.

Data Services

Pharos data in bulk and expert analysis from HBN researchers.

Promoting productive workplaces through safety and health research **NIOSH**

Hazard Communication for Disinfectants Used Against Viruses

Health Hazards and Protective Measures

Overview

This information is intended to be used by employers and workers who use cleaning products and disinfectants, specifically those identified as effective against viruses, including [avian \(bird\) flu](#), [Ebola](#), and [SARS-CoV-2](#) (the virus that causes COVID-19).

This page offers information about the health hazards that could be caused by cleaning products and disinfectants and the recommended barrier and respiratory protection workers can use to protect themselves from these hazards. When using disinfectants, the proper barrier protection should be used. This information, focusing on worker safety, supplements existing Centers for Disease Control and Prevention (CDC) guidance for disinfection of viruses.

Both cleaning and disinfecting are important for reducing the spread of viral illnesses. Some viruses may remain viable (living) for hours to days on surfaces made from a variety of materials. Cleaning surfaces followed by disinfection is a best practice for preventing the spread of viral illnesses in the workplace. **Cleaning** refers to the removal of germs, dirt, and impurities from surfaces. Cleaning does not kill germs, but by removing them, it lowers their numbers and the risk of spreading infection. **Disinfecting** refers to using chemicals to kill germs on surfaces. Disinfecting does not necessarily clean dirty surfaces or remove germs, but by killing germs that remain on a surface

On This Page

- Considerations regarding the use of disinfectants
- Health hazards and protective measures for chemicals used as disinfectants
- Additional Resources

<https://www.cdc.gov/niosh/topics/disinfectant/default.html>

Since the information about hazards is not always complete, and only one quat is listed, a good resource is the Healthy Building Network's Pharos database -- <https://pharosproject.net/>

Bleach – sodium hypochlorite

The company data sheet says:

<https://www.thecloroxcompany.com/wp-content/uploads/cloroxregularbleach27-13-16pde.pdf>

Under California law, the company says ingredients are:

<https://smartlabel.labelinsight.com/product/6190765/ingredients>

NIOSH says:

Causes severe skin burns and eye damage.

May cause respiratory irritation.

Pharos says:

<https://pharosproject.net/chemicals/2010315 - hazards-panel>



LYSOL® Disinfectant Spray


0-19200-92983-7 19.0 ounces aerosol can

0-19200-92984-4 12.5 ounces aerosol can



10000441

Disinfectant Spray



Ingredients & Contents



Health, Safety & Environment



Usage & Handling



Features & Benefits



Company, Brand & Sustainability

This Ingredients tab shows the ingredients in this product grouped into the following categories: Active Ingredients, Intentionally Added, Fragrance Components and Non Functional Constituents. Ingredients that appear on a Designated List or are fragrance allergens included on Annex II of the EU Cosmetics Regulation No. 1223/2009 are indicated by the  symbol. [Click here](#) for more information on the Designated Lists.

ACTIVE >

INTENTIONALLY ADDED  >FRAGRANCE COMPONENT  >

Acetyl Cedrene >

Delta-3-Carene  >


Dihydromyrcenol >

Dipropylene Glycol >

Ethylene Brassylate >

Eugenol  >

Linalyl Acetate >

NON-FUNCTIONAL CONSTITUENT  >

The list above contains the product ingredients listed in descending weight percent within each category. The ingredient names use the INCI (or equivalent) nomenclature system. [Click here](#) for more information on the nomenclature system.

LYSOL® Disinfectant Spray

0-19200-92983-7 19.0 ounces aerosol can

0-19200-92984-4 12.5 ounces aerosol can



10000441

Disinfectant Spray


Ingredients & Contents





Health, Safety & Environment

Usage & Handling

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This Ingredients tab shows the ingredients in this product grouped into the following categories: Active Ingredients, Intentionally Added, Fragrance Components and Non Functional Constituents. Ingredients that appear on a Designated List or are fragrance allergens included on Annex II of the EU Cosmetics Regulation No. 1223/2009 are indicated by the  symbol. [Click here](#) for more information on the Designated Lists.

ACTIVE INTENTIONALLY ADDED  Water Butane Propane Ethanolamine  Fragrance/Parfum MEA-Borate MIPA-Borate Ammonium Hydroxide  FRAGRANCE COMPONENT  NON-FUNCTIONAL CONSTITUENT  

The list above contains the product ingredients listed in descending weight percent within each category. The ingredient names use the INCI (or equivalent) nomenclature system. [Click here](#) for more information on the nomenclature system.

Ethanolamine – *restricted in some places*

Restricted Substance Lists (4)

- US EPA - DfE SCIL: Yellow Triangle - best available in class but some hazard profile issues
- EU - PACT-RMOA Substances: Substances selected for RMOA or hazard assessment
- HBN - Priority Asthmagens: Priority Asthmagen to Avoid
- P&W - Precautionary List: Precautionary list of substances recommended for avoidance

<https://pharosproject.net/chemicals/2009243 - hazards-panel>

HBN - Priority Asthmagens

HBN Priority Building Material Asthmagens List

This list is based on the Healthy Building Network (HBN) Report entitled:

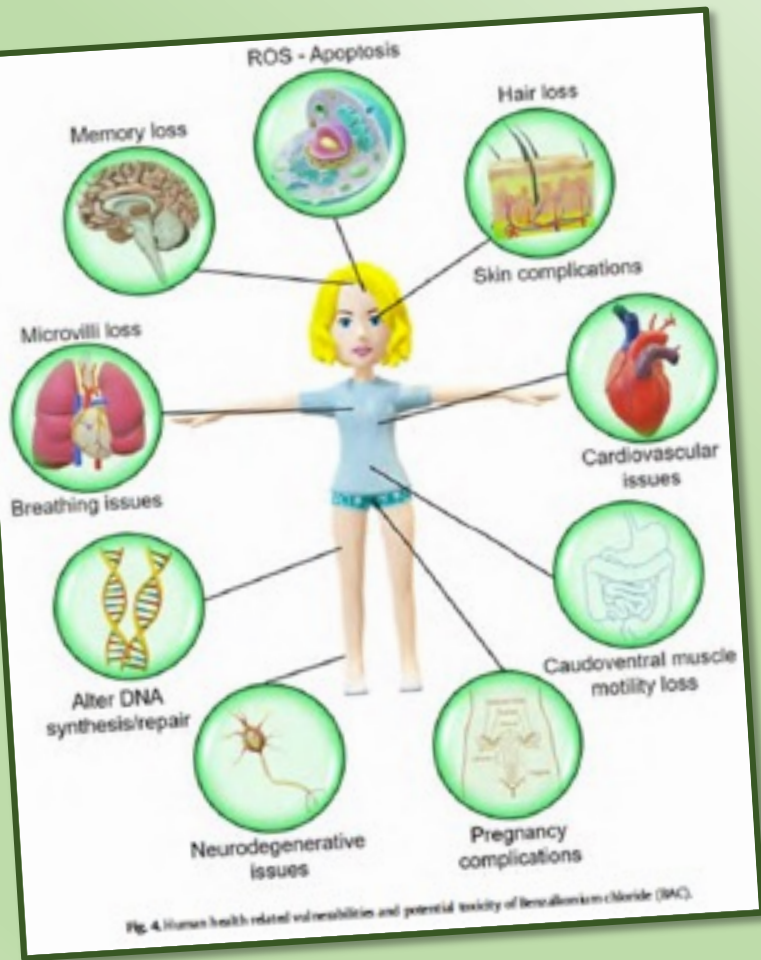
Full Disclosure Required: A Strategy to Prevent Asthma Through Building Product Selection

HBN cross-referenced building material content data from Pharos against three authoritative lists of asthmagens maintained by the **Association of Occupational and Environmental Clinics (AOEC)**, **Commission de la santé et de la sécurité du travail (CSST)**, and **Collaborative on Health and the Environment (CHE)**. This exercise identified 40 chemicals asthma and are present in interior building materials.

HBN also examined emerging science not yet reflected in these lists, which identified 12 additional chemicals associated with asthma and present in interior building materials.

The screenshot shows the 'Precautionary List' page on the Pharos Project website. At the top, there is a 'TRANSPARENCY' header with navigation links for 'LEARN MORE', 'PRECAUTIONARY LIST', 'STAY INFORMED', and 'FAQ'. Below this is a large image of a hand pointing at architectural blueprints with the title 'Precautionary List' and a sub-header 'Browse substances of concern by project type, product type, CSI specifications, and hazards'. Underneath the image are three tabs: 'PRECAUTIONARY LIST', 'WATCH LIST', and 'BANNED LIST'. A search bar is present with filters for 'SEARCH SUBSTANCES', 'PROJECT AREA', 'WATERFRONT', 'PROJECTS', 'HEALTH HAZARD', and 'ENVIRONMENTAL HAZARD'. Two substance cards are visible: 'Asthmogens - marked with a health star' and 'Bisphenol A (BPA)'.

Quats/QACs have many health effects



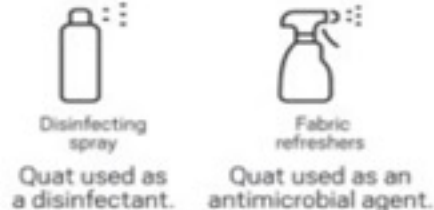
Bilal, M & Iqbal, H.M.N. (2019) "An insight into toxicity and human-health-related adverse consequences of cosmeceuticals — A review", *Science of the Total Environment*, 670: 555–568.

Alkyldimethylbenzylammonium chloride (ADBAC)

A guide to the household products quats are in.



Didecyldimethylammonium chloride (DDAC)



1-Cetylpyridinium chloride (CPC)



Biomonitoring California Scientific Guidance Panel Meeting, March 2020 -- quats added as designated chemical

The widespread use of quats coupled with the observations that they showed up in human samples and findings of potential toxicity in animals and cells has pushed some researchers to scrutinize these chemicals further. On March 4, after hearing Hrubec and Xu present their research and Hostetler's counterarguments, a panel of nine scientists voted unanimously to place quats in the Biomonitoring California program.



“Do we know enough about the safety of quat disinfectants?” XiaoZhi Lim, C&EN

<https://cen.acs.org/safety/consumer-safety/know-enough-safety-quat-disinfectants/98/i30>

<https://biomonitoring.ca.gov/events/biomonitoring-california-scientific-guidance-panel-meeting-march-2020>

Problems with “Quats”

Quaternary ammonium chlorides (“Quats”)

- ✗ Cause occupational asthma
- ✗ Can be corrosive to eyes and skin (especially if high pH)
- ✗ Often need to be rinsed off
- ✗ Build up in sewage sludge
- ✗ Linked to antibiotic resistance
- ✗ Can “bind” to cloth or mop
- ✗ Are ineffective when sprayed into air



Others like the Green Science Policy Institute (GSPI) are worried too

Antimicrobials in the Time of Coronavirus

Ted Schettler, Science Director, Science and Environmental Health Network,
Antimicrobials in the Time of Coronavirus.

Anne Cooper-Doherty, Sr. Envir. Scientist,
DTSC Safer Consumer Products Program,
Antimicrobials in the Time of Coronavirus:
Quaternary Ammonium Compounds.

Rolf Halden, Professor, Arizona State University,
Antimicrobials in the Time of COVID-19: Striking a Balance between Public Safety and Sustainability.

Exposure Concerns

- Stick to surfaces in indoor and outdoor environment
- Sprays/aerosols
- Down-the-drain
 - Wastewater treatment not designed for QAC removal
- Exposure data is limited



<https://greensciencepolicy.org/past-events-6classes-v-workshop2020-2/>

Didecyl dimethyl ammonium chloride

(7173-51-5)

This is the only quaternary ammonium compound on NIOSH's list of disinfectants for viruses. There, the hazards are: *Toxic if swallowed. Causes severe skin burns and eye damage.*

Not quite what others say:

<https://pharosproject.net/chemicals/2007758#hazards-panel>



Restricted Substance Lists

- [GSPI - Six Classes of Problematic Chemicals: Antimicrobials](#)
- [P&W - Precautionary List: Precautionary list of substances recommended for avoidance](#)

March 4, 2020

Caviwipes – Metrix disclosure document

Ingredients

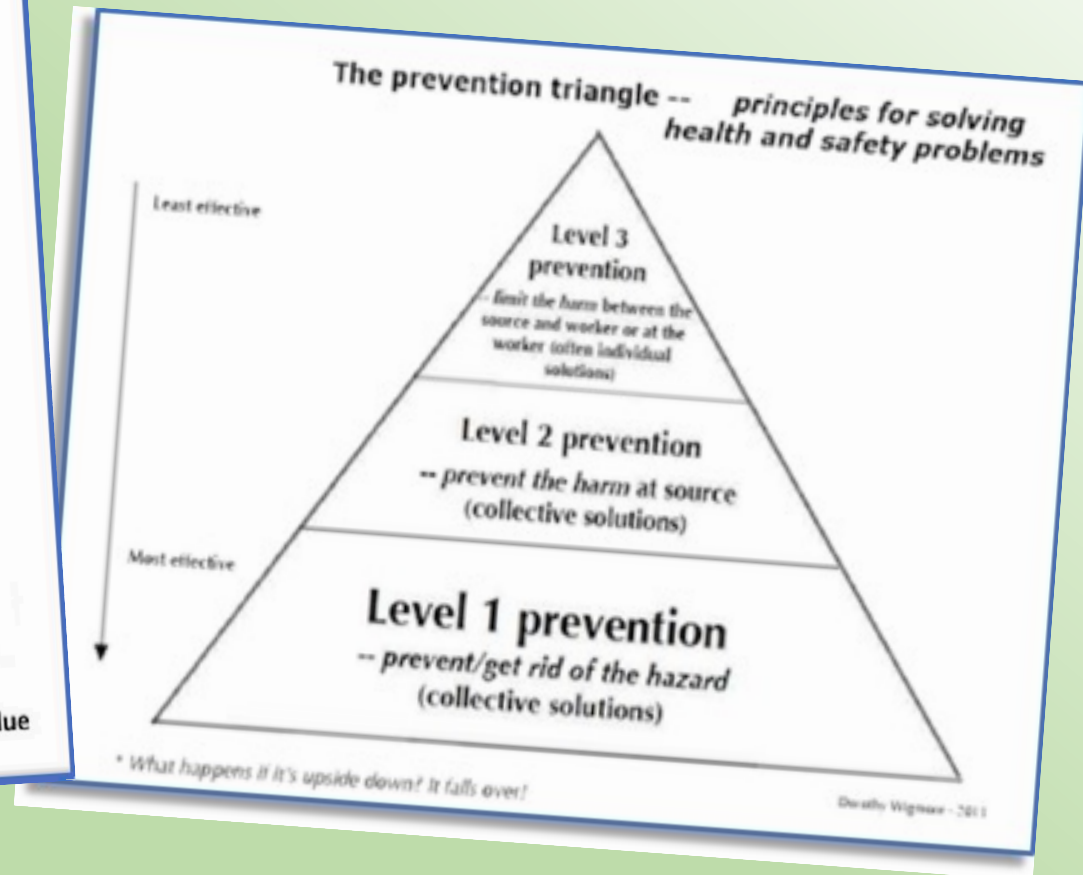
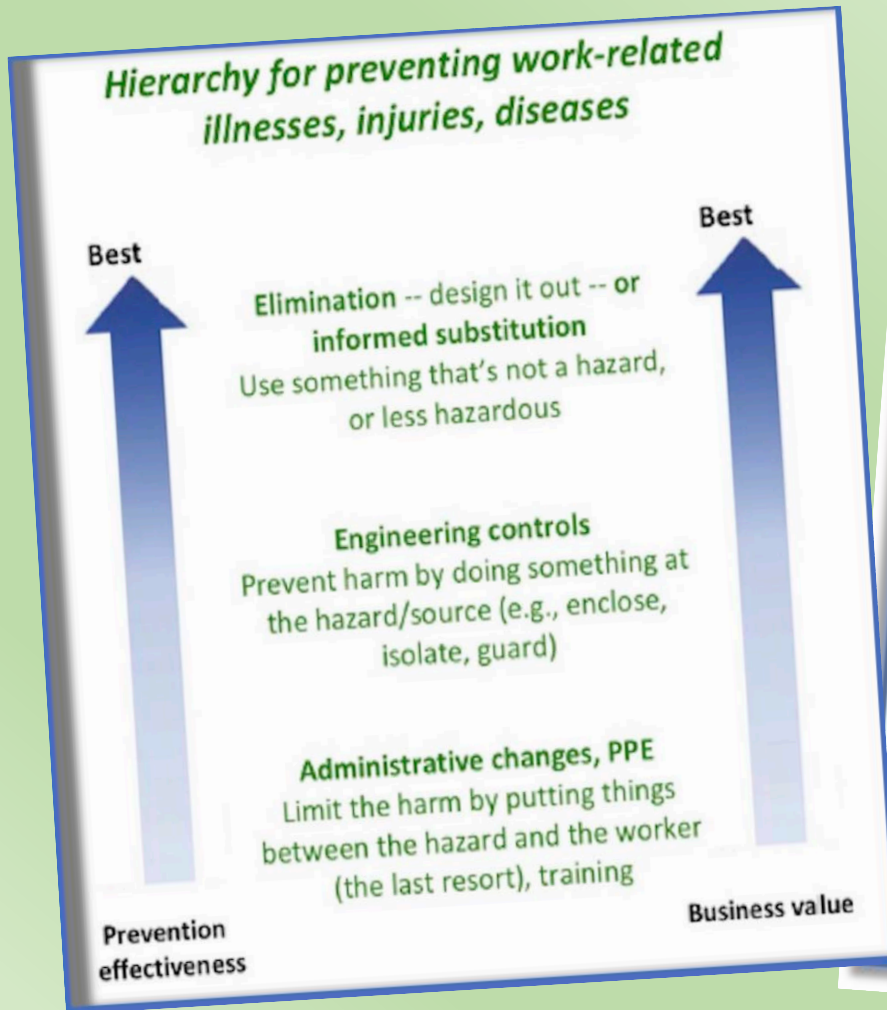
Ingredient Name	CAS	Present on Designated List	Function (HCPA)
Water	7732-18-5	No	Solvent
Isopropanol	67-63-0	No	Solvent / active ingredient
Ethylene Glycol Monobutyl Ether	111-76-2	CA TACS	Solvent
Diisobutylphenoxyethoxyethyl dimethyl benzyl ammonium chloride	121-54-0	No	Active ingredient
Surfactant	With held for CBI	No	Cleaner
Surfactant	With held for CBI	EU Endocrine Disruptors (non human), Marine Priority Action Chemical	Cleaner
Sodium Hydroxide	1310-73-2	No	pH adjustment

<https://embed.widencdn.net/download/kavokerr/fqzirqcg3i/CaviWipes-Cleaning-Disclosure-to-post-2020-03-09.pdf?u=iywcz>

To find ingredients required to be disclosed under California law

- ❑ [Smartlabel.org](https://www.smartlabel.org): Clorox, P&G, Colgate-Palmolive, Seventh Generation, RB (Lysol)
- ❑ S.C. Johnson: <https://www.whatsinsidescjohnson.com/us/en/brands>
- ❑ Church & Dwight (Arm & Hammer) is here: <https://churchdwight.com/ingredient-disclosure/>
- ❑ Simple Green: <https://simplegreen.com/ingredient-disclosure/>
- ❑ Maintex: <https://maintex.com/ingredients/>
- ❑ Dollar General: <https://dollargeneral.online-msds.com/sds-ingredients/>
- ❑ One distributor seems to have links to ingredient disclosure websites for products they sell in California: <https://www.fultondistributing.com/documents/ingredient-disclosure>
- ❑ Zep lists them in a “Resources/Ingredient Disclosure” tab on each product page; e.g.: <https://www.zep.com/product/zepcommercial/antibacterial-disinfectant-cleaner-with-lemon>

The principles .. and best practices are ...



The hierarchy of prevention

The first question should always be: *Is it necessary?*



- Do you need to use that toxic cleaner or to disinfect?
- When and where might it be necessary? Who should do it?
- In this pandemic, contact transmission is much less common than small respiratory particles at close range and through the airborne route
- What other measures are being used to keep things clean and uninfected? (e.g., when kids do regular hand-washing throughout the day, it reduces absenteeism and illnesses)
- Are there other ways to deal with people's fears – like good information, signs that spaces have been cleaned ?

What about the workers?

OSHA·NIOSH INFOSHEET

Protecting Workers Who Use Cleaning Chemicals

Workplaces, such as schools, hospitals, hotels, restaurants and manufacturing plants, use cleaning chemicals to ensure the cleanliness of their buildings. Workers who handle these products include building maintenance workers, janitors and housekeepers. Some cleaning chemicals can be hazardous, causing problems ranging from skin rashes and burns to coughing and asthma. Many employers are switching to green cleaning products because they are thought to be less hazardous to workers and the environment. This INFOSHEET provides information to employers on practices to help keep workers safe when working with cleaning chemicals, including green cleaning products.

What is to be done?

- ask: *Is it necessary? if so* least toxic products and methods for cleaning and disinfecting (avoid hygiene theatre)
- make a health and safety plan in which cleaning (and perhaps disinfecting) is a key component
- include workers and their representatives/ unions, procurement/purchasing staff
- (re-)train those using the products and those in the spaces where they are used: hazards, process
- regularly evaluate what's working, what 's necessary – and make changes

Consider changing the process

– e.g., microfibre products



- ✓ Can get rid of 99% of bacteria and some viruses with plain water.
- ✓ Require less water and cleaning chemicals (use 95% less water and chemicals), clean more effectively (10% more area in the same time), and cause fewer worker injuries than traditional alternatives.
- ✓ Act like **dirt magnets**, capturing more dust and germs than string mops (95% versus 68%, according to a U.S. EPA case study). Used dry, they are also very effective for dusting floors or surfaces.
- ✓ Microfiber mops are often not used with the traditional, large mop buckets. Instead, they are wet once in a small bucket, used for one or two rooms, and then can be replaced with a clean mop. This means custodians do not have to lift heavy mop buckets, and are less likely to suffer back injuries. One case study from the University of California Medical Center documented a **reduction in workers compensation claims** where microfiber mops were used.
- ✓ Can **save money**: compared to string mops, last 5 to 10 times longer, cost about 5-6% less with all costs considered.

Other Options

- Superheated steam vapor device
 - Very effective for cleaning and rapid sanitizing/disinfecting
 - Manufacturers have tested devices and proven effective on
 - Harder-to-kill viruses, such as canine parvovirus
 - Similar human coronavirus, such as coronavirus 229E
 - Expected to be effective according to the U.S. Environmental Protection Agency (EPA)



Superheated Steam Vapor Devices

- They are not conventional "steam" cleaners or pressure washers
 - They are devices that use only a little water and a little electricity to clean, disinfect, and deodorize most surface

Virus	Contact Time	Result
Norovirus (Feline Calicivirus)	7 Seconds	>99.99%
Canine Parvovirus	7 Seconds	>99.99%
Avian Influenza (Bird Flu) H9N2	7 Seconds	>99.99%
Human coronavirus 229E	3 Seconds	≥99.94%
MS2 Virus (Non-enveloped "Indicator" Virus)	2 Seconds	>99.99%

EPA Establishment # 82121-WA-01

<https://www.advap.com/pages/peer-reviewed-studies>

What about less toxic products?

“Environmentally preferable” products are independently-certified to contain fewer toxic chemicals than traditional ones.

Look for **Cradle to Cradle (silver or gold levels)**, **Green Seal**, **Safer Choice**. (Another common one, Ecologo, allows quats.)

Also check lists from the Toxics Use Reduction Institute (turi.org), the Responsible Purchasing Network and San Francisco’s environment department’s list sfapproved.org.



No smell is a good smell. Green cleaning products are often color and fragrance free. Traditional cleaning products have added color and fragrances that can cause throat irritation and breathing difficulty. For this reason, green cleaning products do not always have strong scents.

(San Francisco Environment Fact Sheet: Module 1 Introduction. General green cleaning)

If you must use disinfectants, avoid:

- X bleach/sodium hypochlorite
- X quats (quaternary ammonium compounds)
- X phenolics
- X peroxyacetic acid
- X perfumes

If you must use disinfectants, go for:

- ✓ hydrogen peroxide
- ✓ citric acid
- ✓ lactic acid
- ✓ caprylic (octanoic) acid
- ✓ thymol (if other things aren't available)

San Francisco's web tool can help find products with those less toxic active ingredients

Company:

Active Ingredient(s):


Formulation Type

- Select all
- Dilutable
- Fog; Mist
- Ready-to-use
- Wipe

EPA Registration Number	Product name (Click for product info)	Consumer or wholesale (Click for vendor info)	Time to leave product on surface (minutes)	Aerosol	Fragrance-free
84683-3	Benefect Botanical Decon 30 Disinfectant	wholesale	10	not aerosol	not fragrance-free
84683-3	Benefect Botanical Disinfectant All Purpose Cleaner	wholesale	10	not aerosol	fragrance-free
84683-4	Benefect Botanical Disinfectant Wipes	wholesale	10	not aerosol	not fragrance-free

<https://www.sfapproved.org/safer-covid-19-cleaning-products-and-disinfectants>

There are options – an example

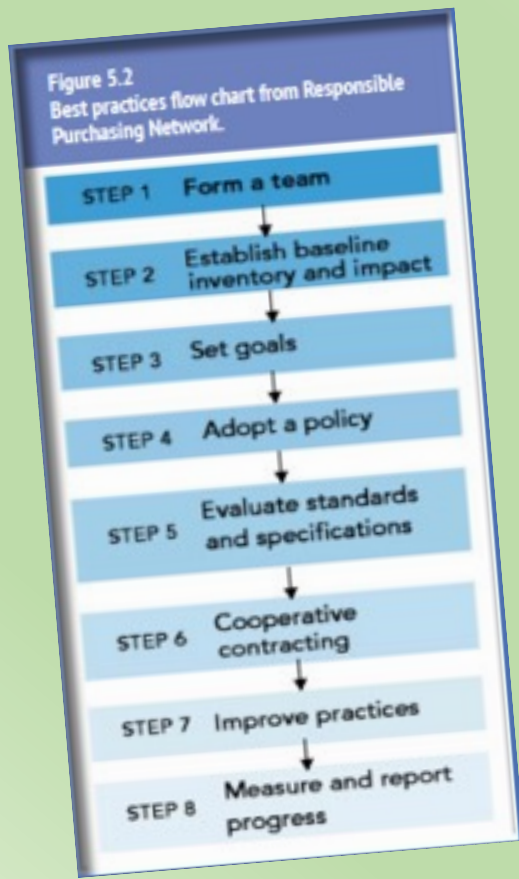
PRODUCT	MANUFACTURER/ SUPPLIER	SCREENING RESULT (PHAROS)	HAZARD(S)	SAFER SUBSTITUTES/ALTERNATIVES		
				ECOLOGO	GREEN SEAL	OTHERS
CaviWipes	Metrex Research	LT-P1	A "quat" in this is an eye and skin irritant, may cause asthma and is an aquatic toxicant.	<p><u>Diversey Oxivir® TB Disinfectant Cleaner Wipes</u></p> 		See the <u>asthma-safe disinfectants</u> from Green Schools and Green Purchasing Institute.

<http://www.greenschools.net/downloads/DisinfectantsTable.pdf>

Tools for informed substitution. How do you find safer chemicals for the workplace?

<https://www.wigmorising.ca/cleaning-products-can-be-green/>

Knowing about substitutes is not enough. What about procurement practices? Are they linked to OHS?



What are the best practices for green procurement policies?

Best practices for a green cleaning procurement policy are to:

- ✓ reference third-party ecolabel standards,
- ✓ designate staff to manage the program,
- ✓ allocate a budget,
- ✓ link to the health and safety committee,
- ✓ include the policy in the health and safety programme, and
- ✓ include benchmarks and reporting requirements (including regular checks for compliance).

Good practices include:

- ✓ **A plan with what to clean, sanitize, and disinfect and when.**
- ✓ **Lots of fresh air ventilation** to dilute vapours and germs in the air.
- ✓ **Clean first** using good practices, then **disinfect only where and when necessary.** Use full dwell times. Follow label precautions and instructions.
- ✓ **Clean and disinfect when spaces are empty.** Go from the cleanest to the dirtiest area within rooms and buildings. Use maximum re-entry times
- ✓ **Use the right product for the right surface.** Most cleaning and disinfecting products are for hard surfaces.
- ✓ **Dilute products safely.** Closed loop systems are the best way to do this. Follow the instructions. Do not try to make the final version stronger.
- ✓ **Pour diluted liquids directly onto a cloth or into water.** If it's in a spray bottle, spray directly into a cloth.
- ✓ **Clean high-touch surfaces regularly.** Use basic cleaners, no perfume. Disinfect only if necessary.
- ✓ **Use dedicated cleaning equipment and materials.** Properly store and clean.
- ✓ **All containers need proper labels,** especially if using diluted chemicals. Include the product and ingredients names and instructions for using it.
- ✓ **Keep the work in-house.** It's a sure way to control what's used, when and how, and by whom.
- ✓ **Provide and train** users about all products, equipment, PPE.

But -- what about soap and water?




Soft surfaces

For soft surfaces such as carpeted floor, rugs, and drapes

- **Clean the surface using soap and water** or with cleaners appropriate for use on these surfaces.
- Launder items (if possible) according to the manufacturer's instructions. Use the warmest appropriate water setting and dry items completely.

OR

- Disinfect with an EPA-registered household disinfectant. [These disinfectants](#)  meet EPA's criteria for use against COVID-19.
- [Vacuum as usual](#).

It could be the answer

- All Purpose Cleaners-Degreasers
 - Does soap work on the SARS-CoV-2 and most viruses?
 - Virus is a self-assembled nanoparticle in which the weakest link is the lipid (fatty) bilayer
 - Theoretically, degreasers should work on dissolving this layer
- Possible but not validated directly yet

Jason Marshall, Toxics Use Reduction Institute; August 28/20

Resources – *pandemic and others*

- ✓ For information about plans, see the University of Washington health and safety document at https://osha.washington.edu/sites/default/files/documents/FactSheet_Cleaning_Final_UWDEOHS_0.pdf.
- ✓ Informed Green Solutions specializes in school cleaning and disinfection, emphasizing less toxic products and practices. See their materials at <https://www.informedgreensolutions.org/covid-19-information>.
- ✓ The Massachusetts Toxics Use Reduction Institute has a cleaning database, with information and names of less toxic products at https://www.turi.org/Our_Work/Cleaning_Laboratory/COVID-19_Safely_Clean_Disinfect.
- ✓ Health Care Without Harm – Europe: *Promoting safer disinfectants in the healthcare sector* includes a webinar and other materials. <https://noharm-europe.org/articles/news/europe/promoting-safer-disinfectants-healthcare-sector>
- ✓ Through the SAICM 2 (Strategic Approach to International Chemicals Management) project, they also work with the Viennese Database for Disinfectants (WIDES Database) <https://www.wien.gv.at/english/environment/protection/oekokauf/disinfectants/index.html>

More resources

- ✓ The Responsible Purchasing Network is working to update San Francisco's 2014 disinfectants report; their latest updated list of less toxic products is at https://osha.washington.edu/sites/default/files/documents/Updated%20Safer%20Disinfectants%20List_March%2026%2C%202020.pdf.
- ✓ Green Seal's *Guidelines for Safer COVID-19 Cleaning and Disinfection* is at https://greenseal.org/storage/publications/Green_Seal_Disinfecting_Guidelines.pdf
- ✓ The Green Science Policy Institute takes a class approach to chemicals and their hazards. One of the six classes is antimicrobials. <https://greensciencepolicy.org/antimicrobials/>
- ✓ For practical guidance about informed substitution of cleaning and disinfecting products, see *Tools for informed substitution: How do you find safer chemicals for the workplace?* at <https://www.wigmorising.ca/cleaning-products-can-be-green/>.

What are your questions?



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