

Identifying Toxic Products and Less-toxic Alternatives

Discussion Handout

Disinfectants (comparing Clorox bleach to Lysol Power & Free Multi-purpose cleaner)

- Read the label - note that the Lysol product is a cleaner as well as a disinfectant.
 - Cleaning removes dirt and organic matter from surfaces with soaps or detergents.
 - Sanitizing kills bacteria on surfaces using chemicals. It is not intended to kill viruses.
 - Disinfecting kills viruses and bacteria on surfaces using chemicals.
 - Hand sanitizer kills pathogens (microorganisms that cause disease, including bacteria and viruses) on skin.
 - Disinfecting is important in spaces where there is elevated risk of infection, such as health care facilities, day care facilities, and restaurants, but probably is not necessary in lower-risk facilities, such as offices or homes.
- Clorox bleach is typically diluted when used as a disinfectant. Concentrated chemicals may be preferred from a perspective of reducing GHG emissions associated with transportation (You're not transporting water but using water onsite that has a much lower carbon footprint.) There is also less packaging waste. Concentrated products can be riskier to the person diluting them because the ingredients are in higher concentration - so a cleaner that might not cause serious problems if a bit gets in your eye or on your skin, can cause serious problems in the concentrated form. What potential problems are there when diluting a chemical? What "controls" or procedures could be implemented to protect workers and assure proper dilution rates? (Use specific equipment designed to dilute the chemical without a person having to pour things, provide training on diluting chemicals, include clear instructions & pictures at the point where dilutions are accomplished, provide properly labeled spray bottles for diluted chemical, dilute chemical in easy-to-access container that is easy to pour into spray bottles, use a funnel to pour diluted chemical into spray bottle, make all the dilutions in a sink or pan to catch drips, etc.)
- When prioritizing based on chemical content, remember we try to avoid chlorinated products ("chlor" in ingredient name), quaternary products ("ium chloride" in ingredient name) and forever chemicals such as PFAS ("fluor" in the ingredient name). Do you see any chemicals to avoid in the ingredients?
- What do you notice about storage of the products? (Store similar pH together: acids with acids, bases with bases; Clorox is basic, Lysol is acidic)
- When using disinfectants, what would be the most likely routes of exposure? (Aerosol and dermal for the worker; oral for the babies.)



Lysol Power & Free Multi-purpose cleaner with hydrogen peroxide

Hazard Signal Word: Warning

Hazard Statements: May be corrosive to metals.

Chemicals: 1-(2-butoxy-1-methylethoxy)propan-2-ol, Hydrogen Peroxide, Citric Acid

VOC content: no data available

pH: 2.1 – 3.5

Clorox

Hazard Signal Word: Danger

Hazard Statements: Causes severe skin burns and eye damage.

Chemicals: Sodium Hypochlorite.

VOC content: no data available

pH: 11.8 – 12.4

Glass Cleaners (comparing Windex with vinegar to Invisible Glass cleaner)

- The Invisible glass cleaner is a hydrocarbon blend and is flammable. The Windex uses vinegar, which is an acid.
- Some glass cleaners contain Ammonia, but we don't have one here, nor do we recommend it. (Ammonia is an irritant to the nose and eyes but the amount of ammonia used in Windex will not cause a reaction in most people. However, people can become sensitized to it, meaning that it will bother them over time if they continue to use it.)
- What do you know about using ammonia and bleach together? (Mixing these chemicals together releases dangerous chloramine gas. So don't have products containing ammonia and products containing bleach used for the same job, such as cleaning restrooms or kitchens.) What concerns do you have when purchasing cleaning products containing bleach? What concerns do you have when purchasing cleaning products containing ammonia? (Workers need to be aware of potential reaction if products are mixed) Is it possible to not purchase one of these? (No ammonia or no bleach?) Is it possible to purchase neither of these?
- What do you notice about storage of the products? (Store similar pH together: Store acids with acids, bases with bases; EPA's Safer Choice criteria calls for the product to have a pH between 2 and 11.5. Do not store products containing ammonia with those containing bleach, store Invisible Glass cleaner in a flammable cabinet.)
- Windex has a very low VOC content, but that doesn't mean it won't evaporate quickly or have volatile ingredients. Remember that VOCs are, by definition, photochemically reactive and will react with nitrogen oxides to create ground-level ozone (smog). Acetone evaporates quickly, for example, but it is not a VOC.



Windex Class Cleaner with Vinegar

Hazard Signal Word: none

Hazard Statements: none identified

VOC content: 0.5%

Chemicals: ethyleneglycol monohexylether, lactic acid

pH: 3.3

Invisible Glass cleaner

Hazard Signal Word: Warning

Hazard Statements: Flammable Liquid, Serious Eye Damage/Eye Irritation.

Chemicals: Proprietary hydrocarbon blend

VOC: 1-20%

pH: no information

Degreaser/Cleaners (comparing Krud Kutter concentrated cleaner/degreaser to Formula 88 cleaner and degreaser)

- Is there a safe degreaser/cleaner? (The Krud Kutter is a registered “Safer Choice” product but still has the Hazard signal word, “Warning”)
- Exposure route – primarily dermal or inhalation by the worker or consumer using it at home.
- What do you notice about storage of the products? (Both are bases, so store in a cabinet separate from acids. Interesting to note that the Krud Kutter is stronger base than the Formula 88)



Krud Kutter concentrated cleaner/degreaser

Hazard Signal Word: Warning

Hazard Statements: Causes skin irritation, causes serious eye irritation

Chemicals: Ethoxylated Alcohols, sodium metasilicate

VOC content: no information

pH: >12.4

Formula 88 cleaner & degreaser

Hazard Signal Word: Danger

Hazard Statements: May be corrosive to metals, causes severe skin burns and eye damage, may cause respiratory irritation

Chemicals: Sodium Metasilicate Penta, Ethylene glycol monobutyl ether

VOC content: not available

pH: 8.7-9.5

Toilet Bowl Cleaners (comparing ZEP Acidic Toilet Bowl Cleaner to Nellie’s Toilet Bowl Cleaner)

- Nellies has no Hazard signal word but has a low pH. Both cleaners are acid based. (Not sure why there’s no hazard signal word for Nellie’s) There are some toilet cleaners that use quaternary ammonium compounds (QACs) which are fine for most people but some types of QACs can potentially cause occupational asthma and/or work-exacerbated asthma. See the fact sheet for more information, https://www.mountsinai.org/files/MSHealth/Assets/HS/Patient-Care/Service-Areas/Occupational-Medicine/QACsInfoforPhysicians_18.pdf
- Most likely route of exposure: Flushing toilets releases aerosols. How does this information impact the decision of which product to use or how to use it? (Release of aerosols underscores the importance of PPE and good ventilation. May want to clean toilets and flush just before leaving restroom. Custodians have higher and repeated exposure to these cleaning chemicals. The customers who use the restrooms have limited exposure.)
- What do you notice about storage of the products? (Store similar pH together: Store acids with acids, bases with bases)



ZEP Acidic Toilet Bowl Cleaner

Hazard Signal Word: Danger

Hazard Statements: Causes severe skin burns and eye damage

Chemicals: Hydrochloric acid; amines, tallow alkyl, ethoxylated; dodecyldimethylamine oxide

VOC content: no data available

pH: 1

Nellie’s Toilet Bowl Cleaner

Hazard Signal Word: none

Hazard Statements: Moderate eye irritant

Chemicals: Citric Acid, Laureth-7

VOC content: not listed

pH: 2.1-3.5