

# 4 Managing Your Chemicals

## 4.1 Minimizing Use of Janitorial Products

## 4.2 Safe Storage & Mixing

## 4.3 Obtaining Adequate Disinfection

## 4.4 Adding Labels To Your Containers

**In This Section** - Earlier we talked about reducing risks by shifting to safer products. Another way to reduce risks is to minimize the amounts of chemical you use.

Minimizing chemicals means selecting the right product for the job, diluting it to the right concentration, and then applying it according to directions. Safe storage & mixing are important parts of this effort.

Disinfection is a task where people tend to use more chemicals than they need, so we will discuss how to get good results when you are disinfecting surfaces.

Then, we will discuss how to put your own labels on the products that your people are using. Good labels make it easier for people to pick up the right product and use it correctly.

**Looking Ahead** - We will wrap up the workshop with a discussion of how to set up your own environmentally preferable purchasing program, and will provide some ideas on where to get more information about both products and purchasing.

## **4.1 Minimizing Use of Janitorial Products**

---

The following are examples of successful pollution prevention strategies for reducing the use of janitorial chemicals. These examples are from a series of fact sheets published on the internet by the Janitorial Products Pollution Prevention Project. Two of these fact sheets are included at the back this section of the workbook.

- Chemical Substitutions - Changing from highly-toxic to less-toxic ingredients. A number of effective, easy-to-use, and low-toxicity janitorial products are now becoming available. Because earlier "green" products did not always meet janitors' expectations, extensive product trials are usually necessary to convince skeptical users to make a change.

Specific examples include changing from:

Carpet shampoo with nitrilotriacetic acid to one made with ingredients that are not carcinogenic;

Glass cleaner containing butoxyethanol to one formulated with isopropanol or non-hazardous ingredients;

General purpose cleaner with alkyl phenyl ethoxylates, ethanolamine, or butoxyethanol to one formulated with linear alcohol ethoxylates, citric acid, or non-hazardous ingredients.

- Chemical Use Reduction - Decreasing the amounts of products with toxic ingredients that janitors use. Some cleaning tasks must use hazardous products because there are no effective substitutes. In these instances the pollution prevention message is to ask the janitor to dilute the product as much as possible, and to use it only when absolutely necessary.

**Floor finish strippers** often contain ammonium hydroxide, ethanolamine, and butoxyethanol, making this product one of the most dangerous handled by janitors. Minimizing floor stripper use by 50% or more is possible by:

Scheduling floor renewal work according to wear patterns rather than simply following a calendar;

Diluting the stripper with as much water as possible (but not so much that the floor finish is removed unevenly);

Carefully and thoroughly applying the diluted stripper;

Using a rotating pad scrubber wherever possible; and

Thoroughly rinsing the stripped floor so as to neutralize the surface prior to applying the new floor finish.

**Acid toilet bowl cleaners** are another of the most hazardous janitorial products. Formulated with hydrochloric, phosphoric, or hydroxyacetic acid, these cleaners are very effective in removing hard water deposits and stubborn stains. However, this much cleaning power is not normally needed every day. Therefore a good pollution prevention strategy is to use two cleaners - a mild product for daily cleaning, and an acid cleaner that is only used when absolutely necessary. Adopting this strategy will usually decrease hazardous material use by over 80%.

- **Building Perimeter Strategies** - Managing the entry of dirt into the building is another way of accomplishing source reduction. Cleanable floor mats, double-door entry chambers, and positive air pressure are all very effective in preventing foot-borne dirt from entering the building in the first place. Less soil in the building means less frequent cleaning, which in turn requires less chemical use.
- **Change Cleaning Process** - Modifying the techniques janitors use for applying their cleaning products can accomplish source reduction. Many environmentally preferable cleaning products work best when they are applied to the surface with some force, and are left in place long enough to loosen and lift the soil that is present.

Work sequencing therefore is important for the product to be used successfully. For example, the first thing a janitor should do in daily cleaning of a restroom is to apply mild cleaners to the sinks and toilet bowls. These cleaners should be left in place while the trash containers are emptied and paper dispensers are refilled. Then the janitor can quickly scrub and rinse the fixtures once the cleaners have been in place for a few minutes. This sequence takes no more time than cleaning the fixtures separately before removing trash and stocking paper supplies.

Other, longer-term pollution prevention strategies include designing buildings with easy-to-clean architectural features (e.g., keep carpets out of locker rooms), taking care that features with incompatible cleaning needs are kept apart from each other (e.g., not situating carpets and vinyl tiles together), and operating building air conditioning systems so as to minimize the movement of dust.

Adopted from a forthcoming article in Pollution Prevention Review by Thomas Barron and Lara Sutherland.

## **4.2 Safe Storage & Mixing**

---

The following are ideas you can use to make your chemical storage and mixing safer.

**Incompatible Products** - Products with incompatible ingredients should be stored separately. For example keep glass cleaner with ammonia away from tub & tile cleaner containing bleach. "Away from" means in a separate room, in a separate cabinet, or on separate shelves (but not one over the other).

**Strong Ingredients** - If you have space, consider storing products with acids or other strong ingredients in plastic tubs so that any leaks will not harm the storage rack or janitorial closet.

**Stock Rotation** - Rotate your stock of stored products so that the oldest ones are used first. Some janitorial products (for example, bleach) have a shelf life. Be sure all such products are used before this time expires.

**Spill Kits** - Keep spill clean-up kits in each building, and train your workers in their use.

**Dispensers** - Automatic dispensers might make sense if you use lots of chemicals, and are working in a building with custodial closets. A well-designed dispensing system can save you money, and also can make chemical mixing safer for your employees. However, mixing units can have problems, particularly when filled with seldom used chemicals, so it is important evaluate your needs carefully before selecting a dispenser. Because of its simplicity and ease of maintenance, a manual dispensing system is usually best.

**Safe Mixing** - Floor strippers and other products with strong chemicals pose the greatest risks when your worker is handling the concentrate. To reduce these risks during mixing:

- Train your employees in safe work procedures.
- Have a supervisor do all mixing.
- Insist that protective gloves and goggles are worn when your employee is handling concentrated products.
- Be aware of Cal/OSHA regulations that require a 15-minute full-flow eye wash station be provided in any area where workers are exposed to corrosive chemicals.
- Many accidents occur when a worker lifts a full mop bucket to pour its contents into a janitorial sink. Teach your employees safe lifting methods.

## **4.3 Obtaining Adequate Disinfection**

---

According to the Federal Center for Disease Control, a thorough cleaning of sinks, toilets, doorknobs, and other hard surfaces that people frequently touch is the first and most important step in preventing the spread of disease.

Even though a good cleaning removes many of the germs living on these surfaces, the ones left behind soon begin to grow and reaccumulate. Therefore, to be safe most janitors also use a disinfectant product to kill the bacteria and viruses that are present. It usually isn't possible to kill everything, including spores. Doing so would require the use of a sterilizer (such as hospitals use for medical equipment).

### **How Disinfectants Work**

Disinfectant products work by oxidizing the germs, breaking down their cell walls, or otherwise deactivating them. Different ingredients or combinations of ingredients kill different germs. Therefore you either need to select a disinfectant that works on the specific germs you are trying to get rid of, or select a broad-spectrum product that works on all of the germs that you might encounter.

**Disinfectants can harm you - always protect yourself by wearing gloves and goggles.**

**Use a disinfectant that kills the specific germs in your building.**

**Follow product mixing instructions, and make up only as much as you need.**

**Leave the disinfectant in place long enough for it to do its job - up to 10 minutes or so for best results**

**Use an ultraviolet light to see how well you are disinfecting.**

How can you tell what germs a disinfectant product will kill? Check the container label or product fact sheets for an EPA Number. All commercially available disinfectants register their effectiveness claims with the EPA.

In order to kill germs your disinfectant must stay wet on the surface for about 10 minutes. Because this time is longer than what most janitorial situations allow, a thorough pre-cleaning of the surface is very important.

## Minimize Disinfectant Use

Because of the potential health risks and impacts on the environment it makes sense to minimize the amount of disinfectant that you use. There are four ways to accomplish this goal:

1. Select the right product. It is best to use a product that contains the specific EPA-registered ingredients needed to kill the germs found in your building. Using the wrong disinfectant wastes your time and money, and doesn't remove the germs.
2. Plan how often to disinfect. Evaluate the amount of traffic your building gets and identify the surfaces that people touch most often. Use an ultraviolet light to reveal how soon germs reappear after cleaning, and then schedule your disinfection work accordingly. Also check disinfection guidelines published for your situation by EPA, Center for Disease Control, and other agencies.
3. Control product mixing. Using full strength disinfectants may be reassuring, but this practice is seldom warranted so it just wastes chemicals. In addition, using the full strength product is more dangerous to the user.

Therefore, make sure that your janitors dilute their disinfectants according to the manufacturer's directions. Typical dilutions are 1 part concentrated product to something in the range of 125 to 500 parts water.

4. Use correct methods. Disinfectants need to be in contact with the germs they are intended to kill. That means the surface must first be cleaned to the point where it is free of dirt, grease, and oil. Then the disinfectant must be thoroughly applied, and left in place for 10 minutes.

It may be necessary to do the work in a new sequence so as to allow this longer contact time. For example, consider doing a pre-cleaning the surfaces and applying the disinfectant throughout a restroom, and then go on to empty the trash and refill paper dispensers.

## **Regular Disinfection**

So what should you do? Clean thoroughly. Use a mild but effective disinfectant product, and use as little of it as possible. Always wear gloves and goggles to protect yourself.

It is usually enough to use an institutional grade disinfectant product for daily hard surface maintenance. In addition, milder sanitization grade products may be used on carpets or in toilet tanks where the goal is to reduce germs to a safe level (typically 0.1%), rather than completely eliminate them.

## **Deep Disinfection**

In some cases you may need to deeply disinfect a part of your building (for example, to clean up where someone has been injured). In that situation, or if you are working in a health care setting, it is important to use a hospital grade disinfectant product. Such products accomplish a more thorough job and kill a broader range of pathogens; however, they are generally more hazardous than institutional grade disinfectants so use them with extreme care.

## **Combined Cleaning & Disinfection**

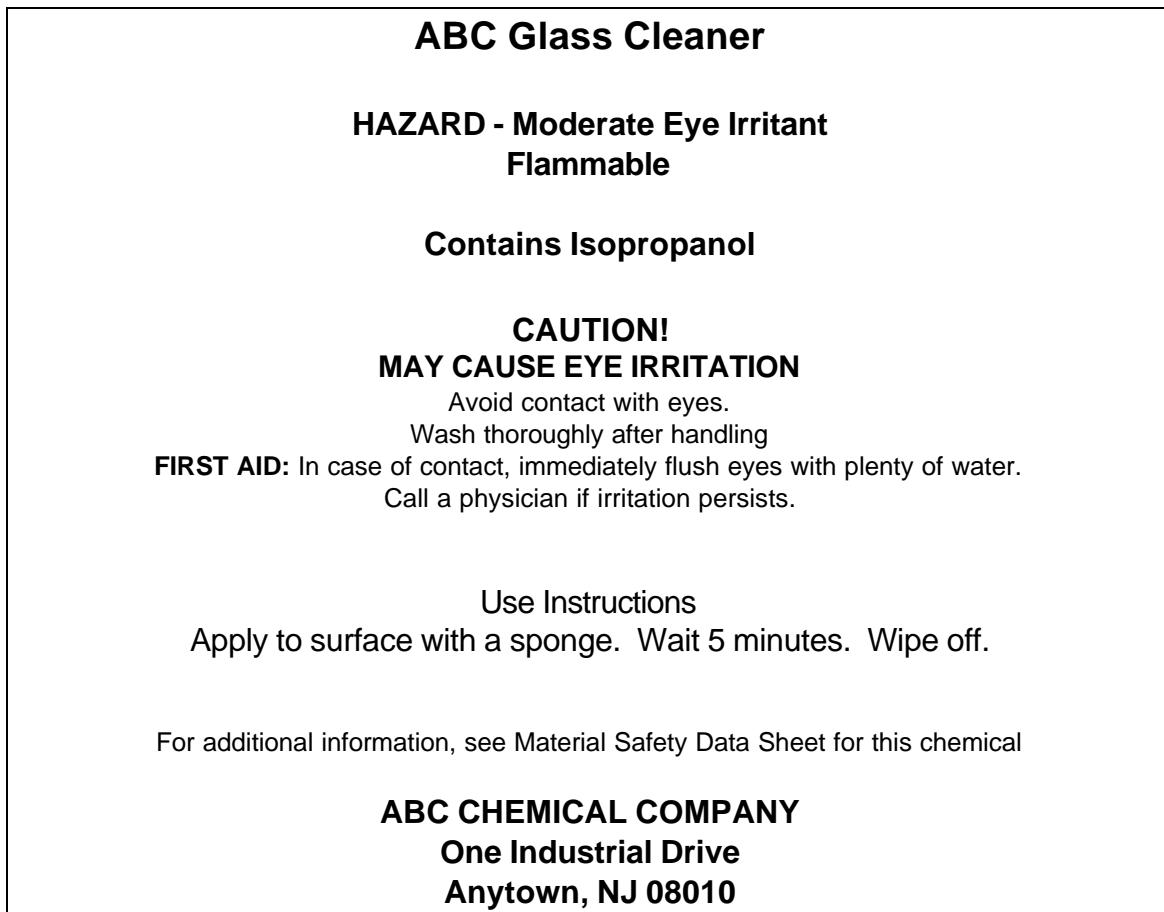
Some products, primarily those containing quaternary ammonium chlorides, may be used for both cleaning and disinfecting. However, these products work best upon surfaces that are already fairly clean, or when they are used twice in a row - once to clean, then to disinfect. If in doubt, use a separate disinfectant after you clean the surface.

## **4.4 Adding Labels To Your Containers**

---

Labels are essential to identify hazardous and non-hazardous materials. They identify what's inside. If the material is a waste, a label tells us how long it has been there. Labels are required for used material or waste collection containers.

If a container loses its label, or if you feel that the original label does not provide all the information you want, prepare a replacement. An example of such a label is provided below:



This page was adapted from the City of Phoenix training program for Hazardous Materials Inventory Management.



## Reducing Floor Stripper Use

Reducing stripper use is a good idea both for safety reasons and for saving money. Floor stripping takes lots of time and so it is expensive. Therefore, stripping should be done only when needed, and then done right so that no time or chemicals are wasted.

### Prevention

You can cut back on the stripping that you have to do by keeping abrasive dirt particles from reaching the floor in the first place.

- Keep dirt outdoors. Use walk-in mats at each entrance to the building. Clean these mats frequently.
- Use dust mops and vacuums to sweep up dirt frequently.
- Wet mop the floor with a liquid cleaner or surface buffering product.

### Monitoring

The next step for reducing stripper use is to carefully monitor the floor refinishing work that you do.

- Strip floor finish only when needed. Keep track of your floors - check them out monthly, or more often if they get a lot of traffic. Refinish only those areas where the surface is wearing out.
- With good records, you will easily spot patterns in the way that floors are wearing. Draw a sketch map of each building you maintain, and record your inspections of the hard floor areas. If you use a computer, make these sketches with your spreadsheet program and record your results each time you do an inspection.

**STRIPPING FLOORS ON A FIXED TIME SCHEDULE CAN WASTE MONEY.**

**IF DONE TOO SOON YOU'LL REFINISH THE FLOOR BEFORE IT'S NEEDED, AND THAT WILL WASTE LABOR AND CHEMICALS.**

**IF YOU WAIT TOO LONG, TRAFFIC WILL WEAR THROUGH THE FINISH AND DAMAGE THE UNDERLAYING FLOOR MATERIAL. WHEN THIS FOUNDATION BECOMES WORN, YOU'LL EITHER HAVE TO REPLACE FLOOR TILES OR SPEND LOTS OF EXTRA TIME TRYING TO GET A SATISFACTORY NEW FINISH.**

- Keep track of the amounts of floor stripper that each crew uses. Your people will respond to what you measure, and so will use less floor stripper when they know that you will be checking.

## **Training**

Additional reduction in floor stripper use comes from training your staff on how to refinish floors correctly.

- Train your people to mix the stripper with as much water as they can while still getting the job done. Most stripper products are meant to be mixed with something like 10 parts of water to one part of concentrate.

Try working at the high end of the dilution range suggested by the supplier. If that works, then try adding a bit more water - but not too much. If you add too much water the stripper will work too slowly, and extra time will be needed to get the job done.

- Help your employees to minimize mistakes, spills, and waste. For example, mistakenly using the same mop to apply stripper and floor finish can cause problems. One good idea is to use different colored buckets or colored heavy-duty trash can liners in the stripper, rinse water, and floor finish buckets. Buy mop heads or handles that are the same three colors as the buckets or liners.
- Also train your people on how to apply stripper to the floor and then rinse it off. Be sure that a machine or hand scrubber is used to help lift the floor finish - simple agitation makes the stripper work more quickly and more uniformly.

Follow set procedures to assure that the stripper will work properly, and thereby reduce the amount of rework that your people have to do.

Source: <http://www.westp2net.org/Janitorial/jp4.htm>



## **Reducing Carpet Chemical Use**

---

Most carpet care products are relatively safe to use, and have only a small impact on the environment. However, some of these products do contain toxic chemicals that are harmful both to the janitor who uses them and to people who occupy the building. It is best to select the mildest products you can find that work effectively.

Also, carpets that are cleaned less often require more and stronger chemicals than carpets that are regularly maintained. It is a good strategy to set up a maintenance program that takes care of carpet needs throughout their useful life.

Using the wrong products or excess amounts of chemicals can easily damage carpets. Therefore, a successful maintenance program will feature the products suited to the work, and will thoroughly train janitors in proper cleaning methods.

A successful carpet care program begins before installation, and then continues with routine vacuuming, maintenance cleaning, and periodic restoration efforts.

### **Carpet Design & Installation**

Carpets are both functional and visually appealing. However, the wrong kind of carpet, or one that is poorly installed will require extra maintenance.

Generally you should match the carpet type, texture, and underlayment to its working environment. It is also important to keep carpets away from situations where water, chemicals, or other hard-to-clean materials are used. For example, locker rooms, kitchens, and copy centers are not good places to install carpet.

In addition, it's essential to consider how nearby, non-carpeted floors or walls will be cleaned. Chemicals used for that kind of maintenance can easily spill over and damage carpets.

### **Dust Prevention**

Preventing soil from entering a building in the first place means carpet cleaning can be less frequent, thereby reducing the amounts of chemicals used.

Large, frequently cleaned walk-on mats should be placed at each high-traffic building entrance. These mats should be large enough to capture several footsteps. Experiment with different sizes and textures to see what works best at each doorway. Every few days these mats will become "full" of soil. Therefore, it's important to vacuum all doorway mats frequently so that they will continue to capture soil before it is carried into the building.

Some modern buildings are totally enclosed. If possible, the heating, ventilating, and air conditioning system in such a building should be operated so that the air pressure just inside each doorway is higher than that of the natural air outdoors. Doing so will push airborne dust back outside.

## **Vacuuming**

Daily vacuuming with strong suction, tight filter, rotating brush machines removes up to half or more of the soil that falls onto carpets. How much effort does it take to attain this level of cleaning? Routine vacuuming, with up to four back and forth strokes of the wand across the carpet, is sufficient for low traffic areas. Up to ten wand strokes may be needed at outside doorways and other high traffic areas. Supplemental vacuuming will be needed along walls and carpet edges where soil tends to accumulate.

## **Other Prevention Techniques**

Some building managers prohibit colored soft drinks, coffee, and other items that will easily stain carpets. Such a tight policy make building occupants unhappy at best. A compromise is to either to have hard floors instead of carpets in food service rooms, or to place sacrificial carpet mats in those areas.

It helps to think of carpets as large, flat air filters. Most light particles and airborne soil will eventually end up attaching to carpets. Unless something is done, significant amounts of carpet soil will come from kitchen fumes and other forms of building use. Properly maintained vents that exhaust outdoors can capture most materials that will otherwise fall out onto the carpets.

## **Carpet Spotters**

Another form of prevention comes from reacting immediately to spills and spots before they have time to become semi-permanent stains. However, thorough training in spill clean-up is very important because using the wrong techniques or

chemicals can smear the spilled substance or set the spot permanently. It is usually best to start with clear, cold water and blotting cloths, and then move on to try stronger chemicals only if needed.

A special word of caution - carpet spot removal products contain some of the most dangerous chemicals found in carpet care products. Use these products sparingly, and only when wearing gloves and goggles. Provide extra ventilation, and if possible do the work when building occupants are elsewhere. In any case, avoid products that have highly dangerous ingredients such as hydrofluoric acid (rust remover), or tetrachloroethylene (Type 4 spot remover).

## **Maintenance Cleaners**

Rotary bonnet cleaners and carpet shampoos usually are fairly mild products. However, it's easy to misuse or over-apply these maintenance cleaners. Such improper use may make it necessary to do hot water extraction more often or more extensively. Either way, the use of excess chemicals or the wrong ones leads to more effort and expense.

The toxic ingredients that are in maintenance cleaners pose their greatest risks through inhalation (e.g., isopropanol) or skin contact (e.g., butoxyethanol or ethanolamine). Therefore, providing good ventilation and wearing gloves are very important to protect the janitor doing the work. It is also important to keep building occupants away from wet, freshly cleaned carpets so as to reduce their exposure to these chemicals.

## **Extractants**

With some exceptions, presprays used with hot water extraction systems are also fairly mild products. Careful application, thorough agitation, sufficient contact time, and extraction before drying help these products do their job, and reduce the amounts of chemicals that would otherwise have to be used in reworking the carpet. Training and experience are needed to prepare the janitor for using these products effectively.

Hazardous ingredients used in hot water extraction products include acid rinses (e.g., hydroxyacetic acid), solvents (e.g., butoxyethanol), and detergents (e.g., alkyl phenol ethoxylates). The best strategy is to choose products without these problem ingredients. If that is not possible, than it is essential that the janitor wear gloves and goggles, and that building occupants are kept away from the area until the work is complete.

## **Mildewcides & Disinfectants**

A few restoration products contain tributyl tin, formaldehyde, and other ingredients that are meant to kill microorganisms, but at the same time are highly toxic to humans. Some of these ingredients, such as tributyl tin, are banned from use in the San Francisco Bay Area because of their potential to cause harm in the environment.

Source: <http://www.westp2net.org/Janitorial/jp4.htm>