MANUFACTURERS REPRESENTATIVES

"Connecting Partnerships"

JAN / SAN ENVIRONMENTAL PRODUCTS GUIDE

4th Edition 2024

NEXUS CORPORATE HEADQUARTERS

7042 Commerce Circle, Suite B Pleasanton, CA 94588 | T 800.482.6088 | F 510.567.1005

www.nexus-now.com

01/24

MISSION STATEMENT

Our mission, as Manufacturer Representatives, is to provide not only a wealth of product information and training to our customers, among our janitorial lines, but also critical industry data and advanced cleaning methods that can help them make better decisions about how they clean. The goal is to make the environment at every customer facility safer and more efficient for all to enjoy.

Chris Matson
President, Nexus

JAN / SAN ENVIRONMENTAL
PRODUCTS GUIDE

TABLE OF CONTENTS

INTRODUCTION

One thing COVID-19 has taught us is that cleaning all air and surfaces is far more important that many of us realized. Equally important is the cleaning staff and all the work they do everyday to maintain a safe and clean environment for the team and all their clientele.

The purpose of this environmental cleaning guide is to provide a deeper understanding into the different types of bacteria , viruses, dust, dirt, mold and mildew that can literally shut down companies, airports and even cities if they are not contained and eliminated. The deadly outbreaks of N1-H1, Ebola, HIV and most recently the COVID-19 Corona Virus actually shut down our social interaction all over the planet. The cost of employees staying home from work, trucks not being able to make their deliveries and manufacturing plants having to shut-down due to the spread of a deadly virus can cripple an economy and a society as a whole. However, the greatest cost is the loss of human life which unfortunately occurs every day in every country due to unsanitary surfaces or conditions, poor air quality, moist warm areas that grow mildew and mold which all contribute to human illness. This guide was not written to promote any one brand in fact the guide is vendor neutral. Our goal with this guide is to define the terminologies used in the JAN/SAN industry, the scope of work, the impact on the environment, on employees as well as the general public. While this is a fairly comprehensive in depth of piece of work, it by no means can account for everything in the industry or new and emerging methods and products. This guide will explain and introduce many different types of safety products, cleaning products, chemicals and equipment with the mindset of having a safer and cleaner environment for everyone, in both the public and the private sector.

Greg Fishburn
Vice President of Sales, Jan San

Written by Chris Matson & Greg Fishburn

WHY DO WE CLEAN?

Today we need to worry about indoor air quality, creating best practices in our cleaning procedures and proper surface disinfecting around a facility, not just in the restrooms. The primary reasons people get sick are from germs on their hands, germs transferred up from a surface or germs that migrate in the air. Here are some other key reasons why we clean:

1. Around 80% of common illnesses are spread by hands that have touched everyday surfaces. It is estimated that the average person has around 1,500 bacteria living on each square inch of skin on their hands. Areas such as underneath the fingernails and between the fingers often harbor even more.
2. Every 3 minutes, a child brings his or her hands to their nose or mouth.
3. Food-borne harmful germs cause 6.5 million cases of gastroenteritis and 9,000 deaths each year.
4. 50-80% of all food-borne illnesses originate in the home.
5. Telephones harbor up to 25,127 germs per square inch.
6. Computer keyboards harbor up to 3,295 germs per square inch.
7. The average toilet seat has 49 germs per square inch.
8. Some cold and flu germs can survive on surfaces for up to 72 hours and viruses can last up to 9 days.
9. The average school-aged child contracts 4 or more colds per year, resulting in more than 164 million lost school days.
10. People with the flu can spread it to others up to 6 feet away through coughs and sneezes.

One of the common myths is that one can clean and disinfect in one step. To properly sanitize or disinfect you must first remove any soil. Next you must follow manufacturer's guidelines including proper dwell time. If the dwell time is shortened the kill ratio will never occur. When people get sick, especially when an epidemic occurs, it not only dramatically impacts businesses and social venues it also can be highly deadly. Viruses like the black plague, small pox, HIV and now COVID-19 have killed millions of people around the world over the centuries. This can all be prevented if we as a society can practice better hygiene, clean and sanitize the environments around us more often.

Since cleaning and sanitizing may be the most important aspects of a sanitation program, sufficient time should be given to outline proper procedures and parameters. Detailed procedures must be developed for all contact surfaces including equipment, overhead structures, cubicles, walls, ceilings, lighting fixtures, HVAC systems, ice machines and anything else that could impact public safety.

Cleaning frequency must be clearly defined for each process line (i.e., daily, after production runs, or more often if necessary). The type of cleaning required must also be identified.

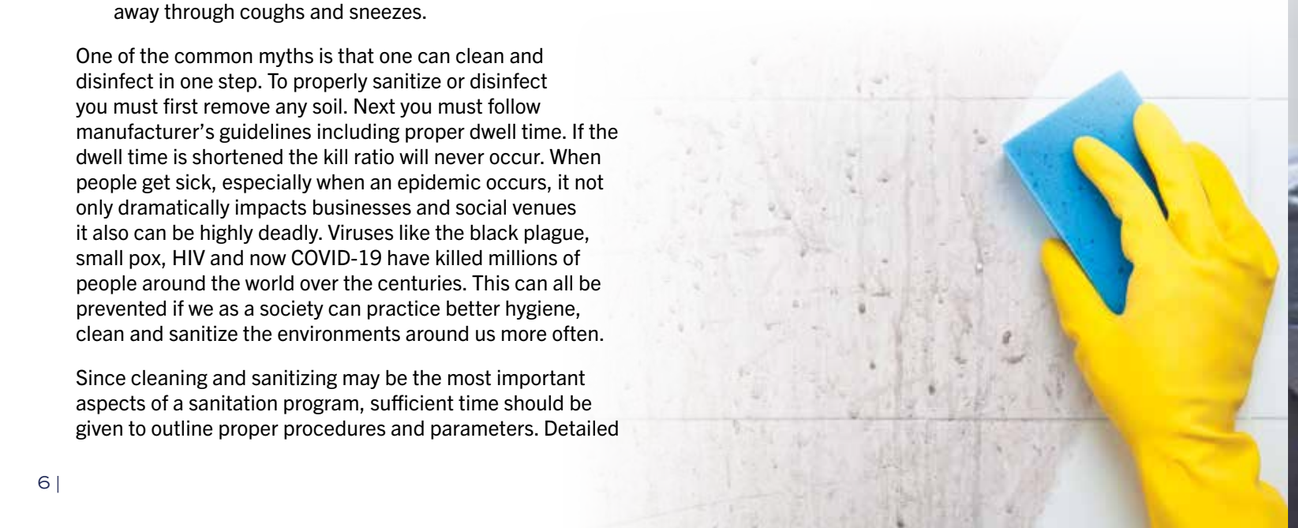
KITCHEN/BREAKROOM AREAS

The objective of cleaning and sanitizing food contact surfaces is to remove food (nutrients) that bacteria need to grow, and to kill those bacteria that are present. It is important that the clean, sanitized equipment and surfaces drain dry and are stored dry so as to prevent bacteria growth. Necessary equipment (brushes, etc.) must also be clean and stored in a clean, sanitary manner.

Cleaning/sanitizing procedures must be evaluated for adequacy through evaluation and inspection procedures. Adherence to prescribed written procedures (inspection, swab testing, direct observation of personnel) should be continuously monitored, and records maintained to evaluate long-term compliance.

The correct order of events for cleaning/sanitizing of food product contact surfaces is as follows:

1. Rinse
2. Clean
3. Rinse
4. Sanitize



CLEANING DEFINITIONS

CLEANING
Cleaning is the complete removal of soil using appropriate detergent chemicals under recommended conditions.

It is important that personnel involved have a working understanding of the nature of the different types of surface materials, soil loads (organic and inorganic) and the chemistry of its removal.

CLEANING METHODS
Equipment can be categorized with regard to cleaning method as follows:

- Mechanical Cleaning. Often referred to as clean-in-place (CIP). Requires no disassembly or partial disassembly.
- Clean-out-of-Place (COP). Can be partially disassembled and cleaned in specialized COP pressure tanks.
- Manual Cleaning. Requires total disassembly for cleaning and inspection.

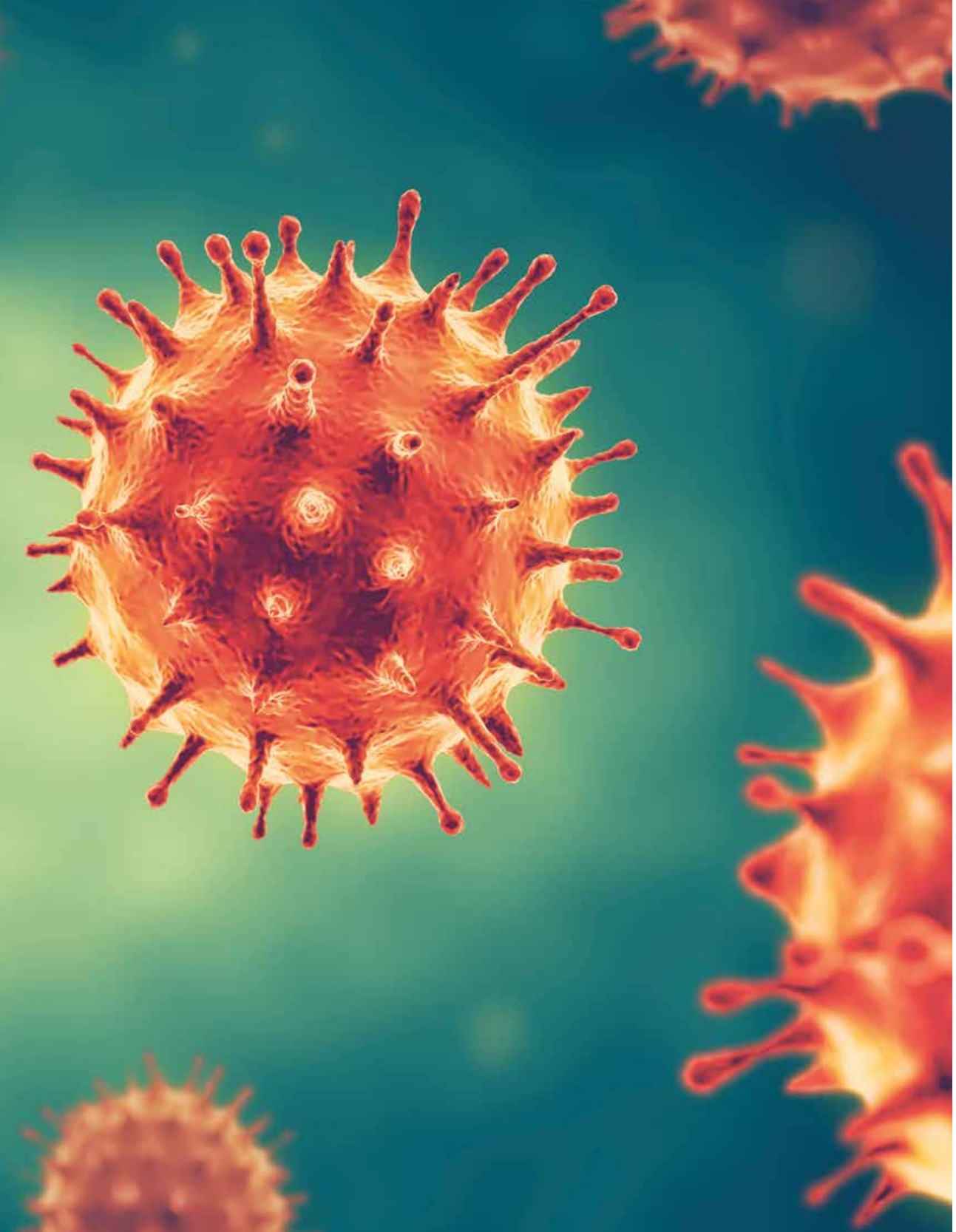
SANITIZATION
It is important to differentiate and define certain terminology:

- Sterilize refers to the statistical destruction and removal of all living organisms.
- Disinfect refers to inanimate objects and the destruction of all vegetative cells (not spores).
- Sanitize refers to the reduction of microorganisms to levels considered safe from a public health viewpoint. Appropriate and approved sanitization procedures are processes, and, thus, the duration or time as well as the chemical conditions must be described. The official definition (Association of Official Analytical Chemists) of sanitizing for food product contact surfaces is a process which reduces the contamination level by 99.999% (5 logs) in 30 sec.

The official definition for non-food contact surfaces requires a contamination reduction of 99.9% (3 logs). The standard test organisms used are Staphylococcus aureus and Escherichia coli.

General types of sanitization include the following:

- Thermal Sanitization involves the use of hot water or steam for a specified temperature and contact time.
- Chemical Sanitization involves the use of an approved chemical sanitizer at a specified concentration and contact time.



GERMS

Germs are found all over the world, in all types of environments. The four major types of germs are bacteria, viruses, fungi, and protozoa. They can invade plants, animals, and people, and sometimes they can make us sick.

BACTERIA
Bacteria are tiny, one-celled creatures that get nutrients from their environments in order to live. In some cases that environment is a human body. Bacteria can reproduce outside of the body or within the body as they cause infections. Some infections that bacteria can cause include ear infections, sore throats (tonsillitis or strep throat), cavities, and pneumonia. But not all bacteria are bad. Some bacteria are good for our bodies — they help keep things in balance. Good bacteria live in our intestines and help us use the nutrients in the food we eat and make waste from what's left over. We couldn't make the most of a healthy meal without these important helper germs! Some bacteria are also used by scientists in labs to produce medicines and vaccines.

VIRUSES
VIruses need to be inside living cells to grow and reproduce. Most viruses can't survive very long if they're not inside a living thing like a plant, animal, or person. Whatever a virus lives in is called its host. When viruses get inside people's bodies, they can spread and make people sick. Viruses cause chickenpox, measles, flu, and many other diseases. Because some viruses can live for a short time on something like a doorknob or countertop, be sure to wash your hands regularly!

FUNGI
Fungi are multi-celled (made of many cells), plant-like organisms. Unlike other plants, fungi cannot make their own food from soil, water, and air. Instead, fungi get their nutrition from plants, people, and animals. They love to live in damp, warm places, and many fungi are not dangerous in healthy people. An example of something caused by fungi is athlete's foot, that itchy rash that teens and adults sometimes get between their toes.

PROTOZOA
Protozoa are one-cell organisms that love moisture and often spread diseases through water. Some protozoa cause intestinal infections that lead to diarrhea, nausea, and belly pain.

Once germs invade our bodies, they dig in for a long stay. They gobble up nutrients and energy, and can produce toxins, which are proteins that act like poisons. Those toxins can cause symptoms of common infections, like fevers, sniffles, rashes, coughing, vomiting, and diarrhea.

1 SOURCE: Ryan J. Brogan, DO

How do doctors figure out what germs are doing? They take a closer look. By looking at samples of blood, urine, and other fluids under a microscope or sending these samples to a laboratory for more tests, doctors can tell which germs are living in your body and how they are making you sick.

HOW CAN YOU PROTECT YOURSELF FROM GERMS?

Most germs are spread through the air in sneezes, coughs, or even breaths. Germs can also spread in sweat, saliva, and blood. Some pass from person to person by touching something that is contaminated, like shaking hands with someone who has a cold and then touching your own nose. Steering clear of the things that can spread germs is the best way to protect yourself. And that means . . .

Washing your hands well and often is the best way to beat these tiny warriors. Wash your hands every time you cough or sneeze, before you eat or prepare foods, after you use the bathroom, after you touch animals and pets, after you play outside, and after you visit a sick relative or friend.

There is a right way to wash your hands. Use warm water and soap and rub your hands together for at least 15 seconds, which is about how long it takes to sing "Happy Birthday."

Cover your nose and mouth when you sneeze and cover your mouth when you cough to keep from spreading germs. So if you have to cough, it is best to do it in your elbow so you are not contaminating your hands.

Using tissues for your sneezes and sniffles is another great weapon against germs. But don't just throw tissues on the floor to pick up later. Toss them in the trash and, again, wash your hands!

Another way to fight and prevent infections is to make sure you get all the routine immunizations from your doctor. You can also keep your immune system strong and healthy by eating well, exercising regularly, and getting good sleep. All this will help you to be prepared to fight germs that cause illness.[1]

MILDEW

Mildew is a form of fungus. It is distinguished from its closely related counterpart, mold, largely by its color: moulds appear in shades of black, blue, red, and green, whereas mildew is white. It appears as a thin, superficial growth consisting of minute hyphae (fungal filaments) produced especially on living plants or organic matter such as wood, paper or leather. Both mould and mildew produce distinct offensive odors, and both have been identified as the cause of certain human ailments.

In horticulture, mildew is either species of fungus in the order Erysiphales, or fungus-like organisms in the family Peronosporaceae. It is also used more generally to mean mould growth. In Old English, mildew meant honeydew (a substance secreted by aphids on leaves, formerly thought to distill from the air like dew), and later came to mean mould or fungus.

Mildew requires certain factors to develop. Without any one of these, it cannot reproduce and grow. The requirements are a food source (any organic material), sufficient ambient moisture (a relative humidity of between 62 and 93 percent), and reasonable warmth (77 °F (25 °C) to 88 °F (31 °C) is optimal, but some growth can occur anywhere between freezing and 95 °F (35 °C)). Slightly acidic conditions are also preferred. At warmer temperatures, air is able to hold a greater volume of water; as air temperatures drop, so does the ability of air to hold moisture, which then tends to condense on cool surfaces. This can work to bring moisture onto surfaces where mildew is then likely to grow (such as an exterior wall). Preventing the growth of mildew requires a balance between moisture and temperature either in such a way that minimal moisture is available in the air and the air temperature is low enough to inhibit growth (at or below 70 °F (21 °C) without causing condensation to occur, or in such a way that warmer air temperatures, without an actual change in the amount of water vapor in that air, is by its nature "drier" (has a lower relative humidity) than cooler air and will tend to inhibit mildew growth in this way[clarification needed]. Warm temperatures coupled with high relative humidity set the stage for mildew growth.

Air conditioners are a tool for removing moisture and heat from otherwise humid warm air. The coils of an air conditioner cause moisture in the air to condense on them, eventually losing this excess moisture through a drain and placing it back into the environment. They can also inhibit mildew growth by lowering indoor temperatures. In order for them to be effective, air conditioners must recirculate the existing indoor air and not be exposed to warm, humid outside air. Some energy efficient air conditioners may cool a room so quickly that they do not have an opportunity to also effectively collect and drain significant ambient water vapor.[1]

1 SOURCE: Wikipedia

MOLD

Mold is a fungus that grows in the form of multicellular filaments called hyphae. In contrast, fungi that can adopt a single-celled growth habit are called yeasts.

Molds are a large and taxonomically diverse number of fungal species in which the growth of hyphae results in discoloration and a fuzzy appearance, especially on food. The network of these tubular branching hyphae, called a mycelium, is considered a single organism. The hyphae are generally transparent, so the mycelium appears like very fine, fluffy white threads over the surface. Cross-walls (septa) may delimit connected compartments along the hyphae, each containing one or multiple, genetically identical nuclei. The dusty texture of many molds is caused by profuse production of asexual spores (conidia) formed by differentiation at the ends of hyphae. The mode of formation and shape of these spores is traditionally used to classify molds. Many of these spores are colored, making the fungus much more obvious to the human eye at this stage in its life-cycle. Molds are considered to be microbes and do not form a specific taxonomic or phylogenetic grouping, but can be found in the divisions Zygomycota and Ascomycota. In the past, most molds were classified within the Deuteromycota.

COMMON MOLDS	
ACREMONIUM	PENICILLIUM
ALTERNARIA	RHIZOPUS
ASPERGILLUS	STACHYBOTRYS
CLADOSPORIUM	TRICHODERMA
FUSARIUM	TRICHOPHYTON
MUCOR	

Molds cause biodegradation of natural materials, which can be unwanted when it becomes food spoilage or damage to property. They also play important roles in biotechnology and food science in the production of various foods, beverages, antibiotics, pharmaceuticals and enzymes. Some diseases of animals and humans can be caused by certain molds: disease may result from allergic sensitivity to mold spores, from growth of pathogenic molds within the body, or from the effects of ingested or inhaled toxic compounds (mycotoxins) produced by molds.

Not all chemicals can destroy mold, some only remove the mold stains. To achieve the desired results, select the proper chemical and follow the manufacturer's guidelines.

There are thousands of known species of molds, which have diverse life-styles including saprotrophs, mesophiles, psychrophiles and thermophiles and a very few opportunistic pathogens of humans. They all require moisture for growth and some live in aquatic environments. Like all fungi, molds derive energy not through photosynthesis but from the organic matter on which they live, utilising heterotrophy. Typically, molds secrete hydrolytic enzymes, mainly from the hyphal tips. These enzymes degrade complex biopolymers such as starch, cellulose and lignin into simpler substances which can be absorbed by the hyphae. In this way, molds play a major role in causing decomposition of organic material, enabling the recycling of nutrients throughout ecosystems. Many molds also synthesise mycotoxins and siderophores which, together with lytic enzymes, inhibit the growth of competing microorganisms. Molds can also grow on stored food for animals and humans, making the food unpalatable or toxic and are thus a major source of food losses and illness. Many strategies for food preservation (salting, pickling, jams, bottling, freezing, drying) are to prevent or slow mold growth as well as growth of other microbes.

Molds reproduce by producing large numbers of small spores, which may contain a single nucleus or be multinucleate. Mold spores can be asexual (the products of mitosis) or sexual (the products of meiosis); many species can produce both types. Some molds produce small, hydrophobic spores that are adapted for wind dispersal and may remain airborne for long periods; in some the cell walls are darkly pigmented, providing resistance to damage by ultraviolet radiation. Other mold spores have slimy sheaths and are more suited to water dispersal. Mold spores are often spherical or ovoid single cells, but can be multicellular and variously shaped. Spores may cling to clothing or fur; some are able to survive extremes of temperature and pressure.

Although molds can grow on dead organic matter everywhere in nature, their presence is visible to the unaided eye only when they form large colonies. A mold colony does not consist of discrete organisms but is an interconnected network of hyphae called a mycelium. All growth occurs at hyphal tips, with cytoplasm and organelles flowing forwards as the hyphae advance over or through new food sources. Nutrients are absorbed at the hyphal tip. In artificial environments such as buildings, humidity and temperature are often stable enough to foster the growth of mold colonies, commonly seen as a downy or furry coating growing on food or other surfaces.

Few molds can begin growing at temperatures of 4 °C (39 °F) or below, so food is typically refrigerated at this temperature. When conditions do not enable growth to take place, molds may remain alive in a dormant state depending on the species, within a large range of temperatures. [1]

1 SOURCE: Wikipedia

DIRT

Dirt is unclean matter, especially when in contact with a person's clothes, skin or possessions. Common types of dirt include:

DUST: a general powder of organic or mineral matter

FILTH: foul matter such as excrement

GRIME: a black, ingrained dust such as soot

SOIL: the mix of clay, sand, and humus which lies on top of bedrock

When things are dirty they are usually cleaned with solutions like hard surface cleaner and other chemicals solutions; much domestic activity is for this purpose — washing, sweeping and so forth.

In a commercial setting, a dirty appearance gives a bad impression. An example of such a place is a restaurant. The dirt in such cases may be classified as temporary, permanent, and deliberate. Temporary dirt is streaks and detritus that may be removed by ordinary daily cleaning. Permanent dirt is ingrained stains or physical damage to an object, which require major renovation to remove. Deliberate dirt is that which results from design decisions such as decor in dirty orange or grunge styling.

As cities developed, arrangements were made for the disposal of trash through the use of waste management services. In the United Kingdom, the Public Health Act 1875 required households to place their refuse into a container which could be moved so that it could be carted away. This was the first legal creation of the dustbin.

Modern society is now thought to be more hygienic. Lack of contact with microorganisms in dirt when growing up is hypothesised to be the cause of the epidemic of allergies such as asthma. The human immune system requires activation and exercise in order to function properly and exposure to dirt may achieve this. For example, the presence of staphylococcus bacteria on the surface of the skin regulates the inflammation which results from injury.

Even when no visible dirt is present, contamination by microorganisms, especially pathogens, can still cause an object or location to be considered dirty. For example, computer keyboards are especially dirty as they contain on average 70 times more microbes than a lavatory seat.

HARMFUL BACTERIA IN SOIL

Bacteria can be found on the human body, within the air you breathe, in water and even in soil. Harmful bacteria found within soil can cause potential harm to humans, plants and trees. Some forms of bacteria can produce poisonous toxins, which can be fatal if the spores of such bacteria are inhaled, ingested or transferred through a wound.[1]

BACILLUS SPECIES
There are a few variety of Bacillus. Bacillus cereus is a bacteria commonly found in soil. B. cereus is capable of withstanding extreme conditions, such as heat. Food grown in soil containing B. cereus can become susceptible to contamination. It is also possible to inhale aggravated B. cereus spores, or have spores enter broken skin when you don't wear gloves while gardening. According to the Textbook of Bacteriology, B. cereus contains three types of enterotoxins. Enterotoxins are toxins produced by bacteria and are responsible for causing the vomiting and diarrhea associated with food poisoning.

CROWN GALL DISEASE
Agrobacterium tumefaciens is a form of bacteria that causes disease in plant tissue. If A. tumefaciens enters a healthy tree or plant through the root or stem from the soil, the bacterium will parasitize the tree or plant. The host of A. tumifaciens will succumb to tumor development and changes in plant metabolism. Tumors can begin as white callused tissue on the tree or plant. To prevent crown gall disease, it is important for plant life to be sustained outside of contaminated soil.

ANTHRAX DEVELOPMENT
Anthrax is caused by the bacterium Bacillus anthracis. B. anthracis can survive for years within soil. When the bacterium produces spores, the potential for contamination becomes possible. Spores can be disturbed during gardening. According to the Directors of Health Promotion and Education, the inhalation of spores from contaminated soil can result in illness. Anthrax is also responsible for producing a toxin that can result in skin ulcers, respiratory distress, fever, vomiting, diarrhea, nausea and possible death.

ANAEROBIC BACTERIA
Anaerobic bacteria don't require oxygen to survive. One particular species, Clostridium perfringens can be found virtually everywhere. The bacteria can be found in the intestines of humans and animals. However, the bacteria is predominantly found in soil and water. C. perfringens is one of the most common bacterium responsible for food-borne illnesses.

1 SOURCE: https://www.hunker.com/13406918/harmful-bacteria-in-soil

DUST

Dust is made of fine particles of solid matter. On Earth, it generally consists of particles in the atmosphere that come from various sources such as soil, dust lifted by wind (an aeolian process), volcanic eruptions, and pollution. Dust in homes, offices, and other human environments contains small amounts of plant pollen, human and animal hairs, textile fibers, paper fibers, minerals from outdoor soil, human skin cells, burnt meteorite particles, and many other materials which may be found in the local environment. Dust kicked up by vehicles traveling on roads may make up 33% of air pollution. Road dust consists of deposits of vehicle exhausts and industrial exhausts, particles from tire and brake wear, dust from paved roads or potholes, and dust from construction sites. Road dust is a significant source contributing to the generation and release of particulate matter into the atmosphere. Control of road dust is a significant challenge in urban areas, and also in other locations with high levels of vehicular traffic upon unsealed roads, such as mines and landfill dumps.

Dust control is the suppression of solid particles with diameters less than 500 micrometers. Dust poses a health threat to children, older people, and those with respiratory illnesses.

Dust is not always visible to the naked eye. Care is required when removing dust so it does not become airborne and redeposit elsewhere. Vacuuming is the best way to remove dust and transport it out of the building.

Certified HEPA (tested to MIL STD 282) can effectively trap 99.97% of dust at 0.3 micrometers. Not all HEPA (type/media) filters can effectively stop dust; while vacuum cleaners with HEPA (type/media) filters, water, or cyclones may filter more effectively than without, they may still exhaust millions of particles per cubic foot of air circulated. Central vacuum cleaners can be effective in removing dust, especially if they are exhausted directly to the outdoors. ULPA filtered vacuums offer a higher filtering rate than EPA vacuums and used in more sensitive areas.

Air filtering appliances differ greatly in their effectiveness. Laser particle counters are an effective way to measure filter effectiveness, medical grade instruments can test for particles as small as 0.3 micrometers. In order to test for dust in the air, there are several options available. Pre weighted filter and matched weight filters made from polyvinyl chloride or mixed cellulose ester are suitable for respirable dust (less than 10 micrometers in diameter).

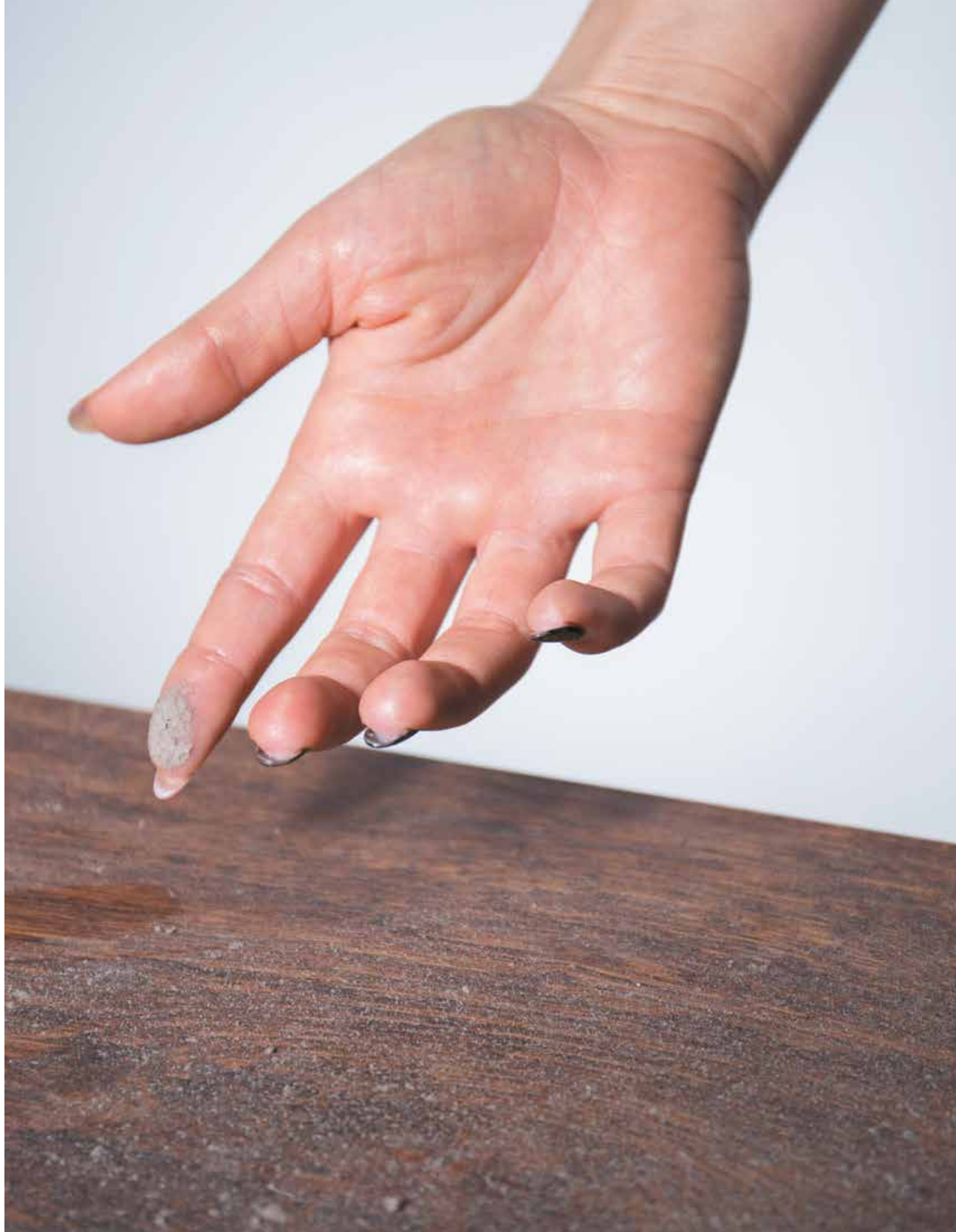
A dust resistant surface is a state of prevention against dust contamination or damage, by a design or treatment of materials and items in manufacturing or through a repair process reduced taciticity of a synthetic layer or covering can protect surfaces and release small molecules that could have remained attached. A panel, container or enclosure with seams may feature types of strengthened rigidity or sealant to vulnerable edges and joins.[1]

IMPROVE CLEANING PRACTICES[2]

Poor cleaning procedures, equipment and habits can inhibit the effective cleaning of buildings. Workers thinking big need to think small when it comes to health and cleaning.

Cleaning for appearance removes “big” visible soil rather than cleaning for health that removes “small” invisible bacteria, dust and airborne particulates and other micro, bio- and chemical contaminates – largely the contributors to unhealthy indoor environments.

- People can inhale particles 10 microns and smaller.
- Housekeeping is probably the most common means of removing potential allergens, and vacuum cleaners are the most commonly used tool.
- Vacuum cleaning removes some fungus and spores from carpeting, but it also reintroduces them to the air, either through the action of the vacuum’s beater bar or through conventional bags.
- Vacuuming without proper filtration is one of the main causes of the reintroduction of allergens and harmful particles into the air.
- Vacuums with high filtration collection systems retrieve soil and safely contain harmful particles, preventing them from being reintroduced into the built environment.



1 SOURCE: Wikipedia
2 JW Vaughan, JA Woodfolk, TA Platts-mIlls. “Assessment of vacuum cleaners and vacuum cleaner bags recommended for allergic subjects”. Journal of Allergy and Clinical Immunology. November 1999. 104(5):914-16. Ibid. Popplewell EJ, Innes VA, et al. Pediatr Allergy Immunol. 2000 Aug;11(3):142-8. “Indoor Allergens: Assessing and Controlling Adverse Health Effects”, Educational Committee on the Health Effects of Indoor Allergens. Division of Health Promotion and Disease Prevention. National Academy Press, Washington, D.C. pp 37-39, 86-117, 222-225

DUST MITES

House dust mites (HDM, or simply dust mites) are mites found in association with dust in dwellings. The main species are:[1]

- Dermatophagoides farinae (American house dust mite)
- Dermatophagoides microceras
- Dermatophagoides pteronyssinus (European house dust mite)
- Euroglyphus maynei (Mayne's house dust mite)

House dust mites are present indoors wherever humans live. Positive tests for dust mite allergies are extremely common among people with asthma. Dust mites are microscopic arachnids whose primary food is dead human skin cells, but they do not live on living people. They and their feces and other allergens which they produce are major constituents of house dust, but because they are so heavy they are not suspended for long in the air. They are generally found on the floor and other surfaces until disturbed (by walking, for example). It could take somewhere between twenty minutes and two hours for dust mites to settle back down out of the air.

Dust mites are a nesting species that prefers a dark, warm, and humid climate. They flourish in mattresses, bedding, upholstered furniture, and carpets. Their feces include enzymes that are released upon contact with a moist surface, which can happen when a person inhales, and these enzymes can kill cells within the human body. House dust mites did not become a problem until humans began to use textiles, such as western style blankets and clothing.

House dust mites, due to their very small size and translucent bodies, are barely visible to the unaided eye. A typical house dust mite measures 0.2–0.3 mm (0.008–0.012 in) in length. For accurate identification, one needs at least 10× magnification. The body of the house dust mite has a striated cuticle.

The average life cycle for a house dust mite is 65–100 days. A mated female house dust mite can live up to 70 days, laying 60 to 100 eggs in the last five weeks of her life. In a 10-week life span, a house dust mite will produce approximately 2,000 fecal particles and an even larger number of partially digested enzyme-covered dust particles.

Dust mites are found worldwide, but are found more commonly in humid regions. The species Blomia tropicalis is typically found only in tropical or subtropical regions. Detectable dust mite allergen was found in the beds of about 84% of surveyed United States homes.

1 SOURCE: Wikipedia

BACTERIA

Bacterial diseases include any type of illness caused by bacteria. Bacteria are a type of microorganism, which are tiny forms of life that can only be seen with a microscope. Other types of microorganisms include viruses, some fungi, and some parasites. Millions of bacteria normally live on the skin, in the intestines, and on the genitalia. The vast majority of bacteria do not cause disease, and many bacteria are actually helpful and even necessary for good health. These bacteria are sometimes referred to as "good bacteria" or "healthy bacteria." Harmful bacteria that cause bacterial infections and disease are called pathogenic bacteria. Bacterial diseases occur when pathogenic bacteria get into the body and begin to reproduce and crowd out healthy bacteria, or to grow in tissues that are normally sterile. Harmful bacteria may also emit toxins that damage the body. Common pathogenic bacteria and the types of bacterial diseases they cause include:

- **ESCHERICHIA COLI AND SALMONELLA**
  cause food poisoning.
- **HELICOBACTER PYLORI**
  cause gastritis and ulcers.
- **NEISSERIA GONORRHOEAE**
  causes the sexually transmitted disease gonorrhea.
- **NEISSERIA MENINGITIDIS**
  causes meningitis.
- **STAPHYLOCOCCUS AUREUS**
  causes a variety of infections in the body, including boils, cellulitis, abscesses, wound infections, toxic shock syndrome, pneumonia, and food poisoning.
- **STREPTOCOCCAL BACTERIA**
  cause a variety of infections in the body, including pneumonia, meningitis, ear infections, and strep throat.

Bacterial diseases are contagious and can result in many serious or life-threatening complications, such as blood poisoning (bacteremia), kidney failure, and toxic shock syndrome. Bacterial diseases are caused by harmful bacteria (pathogenic bacteria). The vast majority of bacteria do not cause disease, and many bacteria are actually helpful and even necessary for good health. Bacterial diseases occur when pathogenic bacteria get into an area of the body that is normally sterile, such as the bladder, or when they crowd out the helpful bacteria in places such as the intestines, vagina or mouth. Less common, bacterial infections can occur when healthy bacteria multiply uncontrollably.

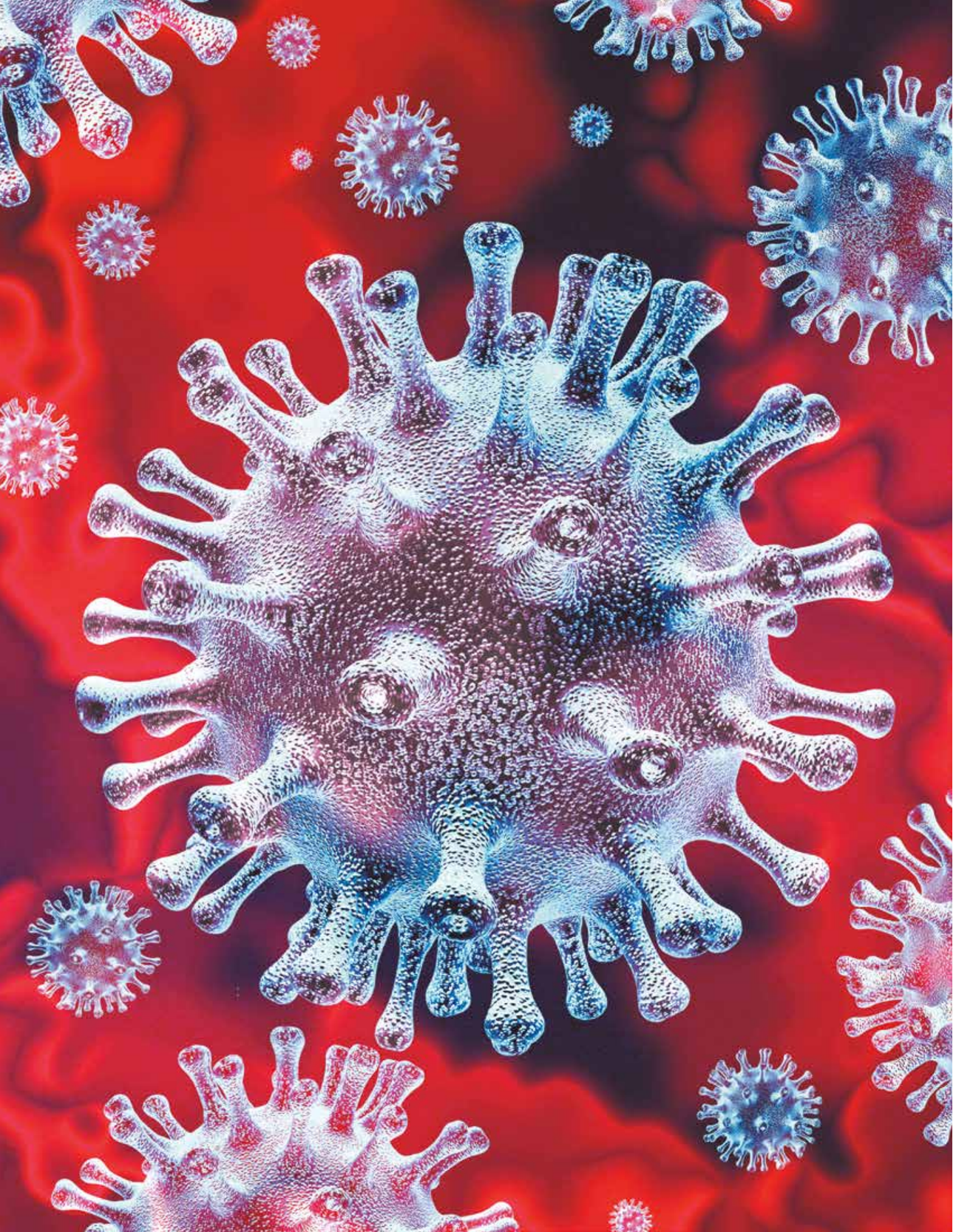
VARIOUS WAYS PATHOGENIC BACTERIA CAN ENTER THE BODY

Pathogenic bacteria can enter the body through a variety of means including:

- Contamination of bites, cuts, rashes, abrasions and other breaks in the skin, gums and tissues
- Eating contaminated food
- Getting bitten by an infected insect
- Having sexual contact with an infected person
- Inhaling contaminated air-borne droplets into the nose and lungs
- Kissing an infected person
- Sharing needles for tattooing or drug use
- Through the eyes, ears or urethra
- Touching infected feces or body fluids, and not washing your hands before eating or touching your mouth, eyes or nose

Once bacteria enters the body, a healthy immune system will recognize the bacteria as foreign invaders and try to kill or stop the bacteria from reproducing. However, even in a healthy person, the body is not always able to stop the bacteria from multiplying and spreading. As the harmful bacteria reproduce, they can crowd out healthy bacteria and microorganisms and emit toxins that damage the cells of the body.[1]

1 Source: Healthgrades.com



VIRUSES

Humans have been battling viruses since before our species had even evolved into its modern form. For some viral diseases, vaccines and antiviral drugs have allowed us to keep infections from spreading widely, and have helped sick people recover. For one disease — smallpox — we've been able to eradicate it, ridding the world of new cases.

But we're a long way from winning the fight against viruses. In recent decades, several viruses have jumped from animals to humans and triggered sizable outbreaks, claiming thousands of lives. The viral strain that drove the 2014-2016 Ebola outbreak in West Africa kills up to 90% of the people it infects, making it the most lethal member of the Ebola family.

But there are other viruses out there that are equally deadly, and some that are even deadlier. Some viruses, including the novel coronavirus currently driving outbreaks around the globe, have lower fatality rates, but still pose a serious threat to public health as we don't yet have the means to combat them. Here are some of the worst killers, based on the likelihood that a person will die if they are infected with one of them, the sheer numbers of people they have killed, and whether they represent a growing threat.

MARBURG VIRUS

Scientists identified Marburg virus in 1967, when small outbreaks occurred among lab workers in Germany who were exposed to infected monkeys imported from Uganda. Marburg virus is similar to Ebola in that both can cause hemorrhagic fever, meaning that infected people develop high fevers and bleeding throughout the body that can lead to shock, organ failure and death.

The mortality rate in the first outbreak was 25%, but it was more than 80% in the 1998-2000 outbreak in the Democratic Republic of Congo, as well as in the 2005 outbreak in Angola, according to the World Health Organization (WHO).

EBOLA VIRUS

The first known Ebola outbreaks in humans struck simultaneously in the Republic of the Sudan and the Democratic Republic of Congo in 1976. Ebola is spread through contact with blood or other body fluids, or tissue from infected people or animals. The known strains vary dramatically in their deadliness, Elke Muhlberger, an Ebola virus expert and associate professor of microbiology at Boston University, told Live Science. One strain, Ebola Reston, doesn't even make people sick. But for the Bundibugyo strain, the fatality rate is up to 50%, and it is up to 71% for the Sudan strain, according to WHO.The outbreak underway in West Africa began in early 2014, and is the largest and most complex outbreak of the disease to date, according to WHO.

HIV

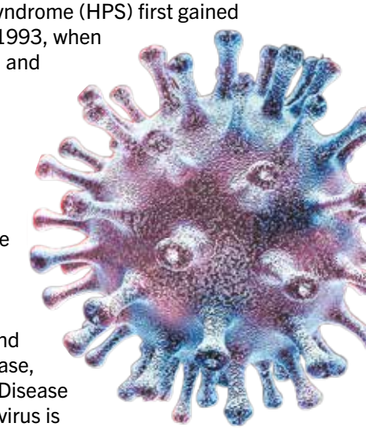
In the modern world, the deadliest virus of all may be HIV. "It is still the one that is the biggest killer," said Dr. Amesh Adalja, an infectious disease physician and spokesman for the Infectious Disease Society of America.An estimated 32 million people have died from HIV since the disease was first recognized in the early 1980s. "The infectious disease that takes the biggest toll on mankind right now is HIV," Adalja said. Powerful antiviral drugs have made it possible for people to live for years with HIV. But the disease continues to devastate many low- and middle-income countries, where 95% of new HIV infections occur. Nearly 1 in every 25 adults within the WHO African region is HIV-positive, accounting for more than two-thirds of the people living with HIV worldwide.

SMALLPOX

In 1980, the World Health Assembly declared the world free of smallpox. But before that, humans battled smallpox for thousands of years, and the disease killed about 1 in 3 of those it infected. It left survivors with deep, permanent scars and, often, blindness. Mortality rates were far higher in populations outside of Europe, where people had little contact with the virus before visitors brought it to their regions. For example, historians estimate 90% of the native population of the Americas died from smallpox introduced by European explorers. In the 20th century alone, smallpox killed 300 million people."It was something that had a huge burden on the planet, not just death but also blindness, and that's what spurred the campaign to eradicate from the Earth," Adalja said.

HANTAVIRUS

The Hantavirus pulmonary syndrome (HPS) first gained wide attention in the U.S. in 1993, when a healthy, young Navajo man and his fiancée living in the Four Corners area of the United States died within days of developing shortness of breath. A few months later, health authorities isolated hantavirus from a deer mouse living in the home of one of the infected people. More than 600 people in the U.S. have now contracted HPS, and 36% have died from the disease, according to the Centers for Disease Control and Prevention. The virus is not transmitted from one person to another, rather, people contract the disease from exposure to the droppings of infected mice. Previously, a different hantavirus caused an outbreak in the early 1950s, during the Korean War, according to a 2010 paper in the journal Clinical



Microbiology Reviews. More than 3,000 troops became infected, and about 12% of them died. While the virus was new to Western medicine when it was discovered in the U.S., researchers realized later that Navajo medical traditions describe a similar illness, and linked the disease to mice.

INFLUENZA
During a typical flu season, up to 500,000 people worldwide will die from the illness, according to WHO. But occasionally, when a new flu strain emerges, a pandemic results with a faster spread of disease and, often, higher mortality rates.

The most deadly flu pandemic, sometimes called the Spanish flu, began in 1918 and sickened up to 40% of the world's population, killing an estimated 50 million people."I think that it is possible that something like the 1918 flu outbreak could occur again," Muhlberger said. "If a new influenza strain found its way in the human population, and could be transmitted easily between humans, and caused severe illness, we would have a big problem."

DENGUE VIRUS
Dengue virus first appeared in the 1950s in the Philippines and Thailand, and has since spread throughout the tropical and subtropical regions of the globe. Up to 40% of the world's population now lives in areas where dengue is endemic, and the disease — with the mosquitoes that carry it — is likely to spread farther as the world warms. Dengue sickens 50 to 100 million people a year, according to WHO. Although the mortality rate for dengue fever is lower than some other viruses, at 2.5%, the virus can cause an Ebola-like disease called dengue hemorrhagic fever, and that condition has a mortality rate of 20% if left untreated. "We really need to think more about dengue virus because it is a real threat to us," Muhlberger said. A vaccine for Dengue was approved in 2019 by the U.S. Food and Drug Administration for use in children 9-16 years old living in an areas where dengue is common and with a confirmed history of virus infection, according to the CDC. In some countries, an approved vaccine is available for those 9-45 years old, but again, recipients must have contracted a confirmed case of dengue in the past. Those who have not caught the virus before could be put at risk of developing severe dengue if given the vaccine.

ROTOVIRUS
Two vaccines are now available to protect children from rotavirus, the leading cause of severe diarrheal illness among babies and young children. The virus can spread rapidly, through what researchers call the fecal-oral route (meaning that small particles of feces end up being consumed). Although children in the developed world rarely die from rotavirus infection, the disease is a killer in the developing world, where rehydration treatments are not widely available. The WHO estimates that worldwide, 453,000 children younger than age 5 died from rotavirus infection in 2008. But countries that have introduced the vaccine have reported sharp declines in rotavirus hospitalizations and deaths.

SARS VIRUS
The virus that causes severe acute respiratory syndrome, or SARS, first appeared in 2002 in the Guangdong province of southern China, according to the WHO. The virus likely emerged in bats, initially, then hopped into nocturnal mammals called civets before finally infecting humans. After triggering an outbreak in China, SARS spread to 26 countries around the world, infecting more than 8000 people and killing more than 770 over the course of two years.

The disease causes fever, chills and body aches, and often progresses to pneumonia, a severe condition in which the lungs become inflamed and fill with pus. SARS has an estimated mortality rate of 9.6%, and as of yet, has no approved treatment or vaccine. However, no new cases of SARS have been reported since the early 2000s, according to the CDC.

SARS
CoV-2 VIRUS – The SARS CoV-2 Virus belongs to the same large family of viruses as SARS-CoV, known as coronaviruses, and was first identified in December 2019 in the Chinese city of Wuhan. The virus likely originated in bats, like SARS-CoV, and passed through an intermediate animal before infecting people.

Since its appearance, the virus has infected tens of thousands of people in China and thousands of others worldwide. The ongoing outbreak prompted an extensive quarantine of Wuhan and nearby cities, restrictions on travel to and from affected countries and a worldwide effort to develop diagnostics, treatments and vaccines. The disease caused by SARS-CoV-2, called COVID-19, has an estimated mortality rate of about 2.3%. People who are older or have underlying health conditions seem to be most at risk of having severe disease or complications. Common symptoms include fever, dry cough and shortness of breath, and the disease can progress to pneumonia in severe cases.

MERS VIRUS
The virus that causes Middle East respiratory syndrome, or MERS, sparked an outbreak in Saudi Arabia in 2012 and another in South Korea in 2015. The MERS virus belongs to the same family of viruses as SARS-CoV and SARS-CoV-2, and likely originated in bats, as well. The disease infected camels before passing into humans and triggers fever, coughing and shortness of breath in infected people. MERS often progresses to severe pneumonia and has an estimated mortality rate between 30% and 40%, making it the most lethal of the known coronaviruses that jumped from animals to people. As with SARS-CoV and SARS-CoV-2, MERS has no approved treatments or vaccine.[1]

1 SOURCE: Live Science.com Author Anne Harding

COVID-19 (CORONAVIRUS)

COVID-19 (CORONAVIRUS)
Coronavirus disease (COVID-19) is a highly contagious disease caused by a newly discovered coronavirus. Coronaviruses are a group of related viruses that cause diseases in mammals and birds. In humans, coronaviruses cause respiratory tract infections that can be mild, such as some cases of the common cold (among other possible causes, predominantly rhinoviruses), and others that can be lethal, such as SARS, MERS, and COVID-19. Symptoms in other species vary: in chickens, they cause an upper respiratory tract disease, while in cows and pigs they cause diarrhea. Coronaviruses constitute the subfamily Orthocoronavirinae, in the family Coronaviridae, order Nidovirales, and realm Riboviria.[5][6] They are enveloped viruses with a positive-sense single-stranded RNA genome and a nucleocapsid of helical symmetry. The genome size of coronaviruses ranges from approximately 27 to 34 kilobases, the largest among known RNA viruses.[7] The name coronavirus is derived from the Latin corona, meaning "crown" or "halo", which refers to the characteristic appearance reminiscent of a crown or a solar corona around the virions (virus particles) when viewed under two-dimensional transmission electron microscopy, due to the surface being covered in club-shaped protein spikes. Human coronaviruses were first discovered in the late 1960s. The earliest ones discovered were an infectious bronchitis virus in chickens and two in human patients with the common cold (later named human coronavirus 229E and human coronavirus OC43).[9] Other members of this family have since been identified, including SARS-CoV in 2003, HCoV NL63 in 2004, HKU1 in 2005, MERS-CoV in 2012, and SARS-CoV-2 (formerly known as 2019-nCoV) in 2019. Most of these have involved serious respiratory tract infections.

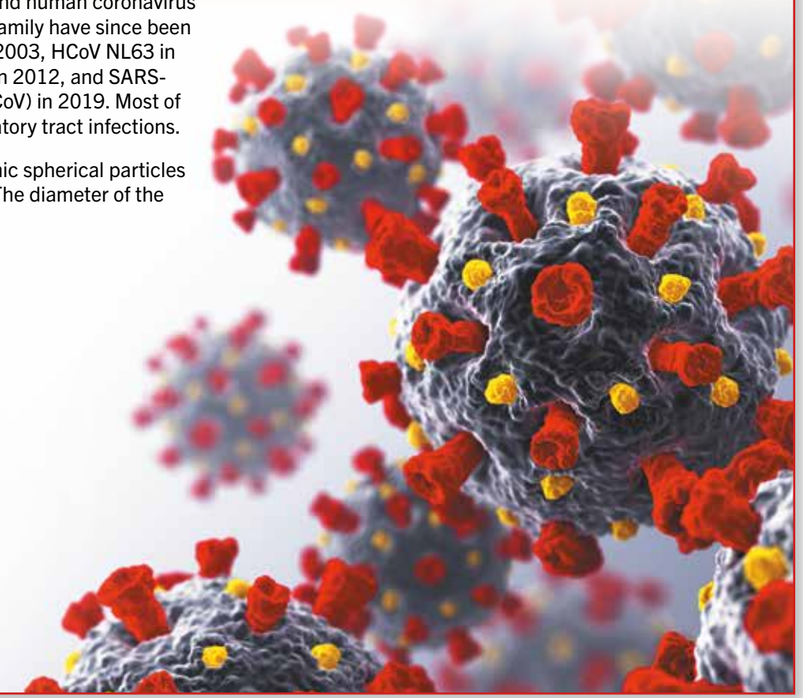
Coronaviruses are large pleomorphic spherical particles with bulbous surface projections. The diameter of the virus particles is around 120 nm.

The envelope of the virus in electron micrographs appears as a distinct pair of electron dense shells.

Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.

The best way to prevent and slow down transmission is be well informed about the COVID-19 virus, the disease it causes and how it spreads. Protect yourself and others from infection by washing your hands or using an alcohol based rub frequently and not touching your face. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it's important that you wear a suitable face mask and practice respiratory etiquette (for example, by coughing into a flexed elbow).

At this time, there are no specific vaccines or treatments for COVID-19. There are yet to be vaccines or antiviral drugs to prevent or treat human coronavirus infections. However, there are many ongoing clinical trials evaluating potential treatments like the anti-malarial drug chloroquine[2].



2 SOURCE: CDC & Wikipedia

INFECTIOUS DISEASES

There are about 130 different types of infectious diseases. For the most part infectious diseases are caused by microscopic organisms that live in other people, animals, or the environment and are too small to see. If you do not come into contact with them, you can prevent many infections and illnesses. Below are a list of the most common infectious diseases around the world:

Acute Flaccid Myelitis
Anaplasmosis
Anthrax
Babesiosis
Botulism
Brucellosis
Campylobacteriosis
Carbapenem-resistant Infection (CRE/CRPA)
Chancroid
Chikungunya Virus Infection (Chikungunya)
Chlamydia
Ciguatera (Harmful Algae Blooms (HABs))
Clostridium Difficile Infection
Clostridium Perfringens (Epsilon Toxin)
Coccidioidomycosis fungal infection (Valley fever)
COVID-19 (Coronavirus Disease 2019)
Creutzfeldt-Jacob Disease, transmissible spongiform encephalopathy (CJD)
Cryptosporidiosis (Crypto)
Cyclosporiasis
Dengue, 1,2,3,4 (Dengue Fever)
Diphtheria
E. coli infection, Shiga toxin-producing (STEC)
Eastern Equine Encephalitis
Ebola Hemorrhagic Fever (Ebola)
Ehrlichiosis
Encephalitis, Arboviral or parainfectious
Enterovirus Infection , Non-Polio (Non-Polio Enterovirus)
Enterovirus Infection , D68 (EV-D68)
Giardiasis (Giardia)
Glanders
Gonococcal Infection (Gonorrhea)
Granuloma inguinale
Haemophilus Influenza disease, Type B (Hib or H-flu)
Hantavirus Pulmonary Syndrome (HPS)
Hemolytic Uremic Syndrome (HUS)
Hepatitis A (Hep A)
Hepatitis B (Hep B)
Hepatitis C (Hep C)
Hepatitis D (Hep D)
Hepatitis E (Hep E)
Herpes
Herpes Zoster, zoster VZV (Shingles)
Histoplasmosis infection (Histoplasmosis)
Human Immunodeficiency Virus/AIDS (HIV/AIDS)
Human Papillomavirus (HPV)
Influenza (Flu)
Lead Poisoning
Legionellosis (Legionnaires Disease)
Leprosy (Hansens Disease)
Leptospirosis
Listeriosis (Listeria)
Lyme Disease
Lymphogranuloma venereum infection (LGV)
Malaria
Measles
Melioidosis
Meningitis, Viral (Meningitis, viral)
Meningococcal Disease , Bacterial (Meningitis, bacterial)
Middle East Respiratory Syndrome Coronavirus (MERS-CoV)
Mumps
Norovirus
Paralytic Shellfish Poisoning (Paralytic Shellfish Poisoning, Ciguatera)
Pediculosis (Lice, Head and Body Lice)
Pelvic Inflammatory Disease (PID)
Pertussis (Whooping Cough)
Plague; Bubonic, Septicemic, Pneumonic (Plague)
Pneumococcal Disease (Pneumonia)
Poliomyelitis (Polio)
Powassan
Psittacosis (Parrot Fever)
Pthiriasis (Crabs; Pubic Lice Infestation)
Pustular Rash diseases (Small pox, monkeypox, cowpox)
Q-Fever
Rabies
Ricin Poisoning
Rickettsiosis (Rocky Mountain Spotted Fever)
Rubella, Including congenital (German Measles)
Salmonellosis gastroenteritis (Salmonella)
Scabies Infestation (Scabies)
Scombroid
Septic Shock (Sepsis)
Severe Acute Respiratory Syndrome (SARS)
Shigellosis gastroenteritis (Shigella)
Smallpox
Staphyloccal Infection , Methicillin-resistant (MRSA)
Staphylococcal Food Poisoning, Enterotoxin - B Poisoning (Staph Food Poisoning)
Staphylococcal Infection, Vancomycin Intermediate (VISA)
Staphylococcal Infection, Vancomycin Resistant (VRSA)
Streptococcal Disease , Group A (invasive) (Strep A (invasive))
Streptococcal Disease, Group B (Strep-B)
Streptococcal Toxic-Shock Syndrome, STSS, Toxic Shock (STSS, TSS)
Syphilis , primary, secondary, early latent, late latent, congenital
Tetanus Infection, tetani (Lock Jaw)
Trichomoniasis (Trichomonas infection)
Trichonosis Infection (Trichinosis)
Tuberculosis (TB)
Tuberculosis (Latent) (LTBI)
Tularemia (Rabbit fever)
Typhoid Fever, Group D
Typhus
Vaginosis , bacterial (Yeast Infection)
Vaping-Associated Lung Injury (e-Cigarette Associated Lung Injury)
Varicella (Chickenpox)
Vibrio cholerae (Cholera)
Vibriosis (Vibrio)
Viral Hemorrhagic Fever (Ebola, Lassa, Marburg)
West Nile Virus
Yellow Fever
Yersenia (Yersinia)
Zika Virus Infection (Zika)[1]

1 SOURCE: CDC

WASH YOUR HANDS!

Regular soap, fancy honeysuckle soap, artisan peppermint soap, just any soap — absolutely annihilates viruses like the coronavirus.

The coronavirus is a bit of material surrounded by a coating of proteins — and fat. Viruses easily stick to places like your hands, but when you rinse your hands with just water, it rushes right over the virus.That's because that layer of fat makes the virus behave kind of like a drop of oil. Oils are just liquid fats.

What happens when you pour oil into water? It floats — it doesn't mix. But add soap…And suddenly that fatty oil dissolves into the water. Soap has two-sided molecules — one end of the molecule is attracted to water, the other end to fat.

When the soap molecules come in contact with water and fat, these dual attractions literally pull the fat apart, surrounding the oil particles and dispersing them through the water.

With that layer of fat holding everything together. When it interacts with soap … bam! The fat gets pulled out by the soap.

Soap literally pulls apart and demolishes these viruses. And then the water rinses the harmless, leftover shards of virus down the drain. But, it takes time for this effect to happen. 20 seconds, to be specific. If you wash for just 5 seconds or 10 seconds, your hands are still covered. The virus is still here, able to get you and others sick. But after a full 20 seconds, the soap actually destroys the virus.

Hand sanitizer works too, because it's mostly alcohol, and alcohol works in a somewhat similar way to soap, breaking down that fatty layer. You need a high concentration of alcohol to make that work. The CDC recommends hand sanitizers with at least 60% alcohol. But even with 60% alcohol, the CDC recommends using soap if you can. If your hands are sweaty or dirty when you use the sanitizer, that can dilute it and diminish its effectiveness.

As for soap, just any old soap works. The FDA says there is no proof that an antibacterial soap has any more effectiveness over plain soap, so don't waste your money.

Just be sure to wash your hands. For 20 seconds. That's singing the "Happy Birthday" song twice.

Just as long as it's 20 seconds.

And you're using the ultimate virus annihilator: soap.

CLEANING PRODUCTS

The earliest cleaning product was plain water, back in prehistoric times. The history of cleaning products began to slowly evolve, until the mid 1900's, when modern soap products began to emerge. Over the past fifty years, soaps and detergents expanded to include automatic dishwasher products, liquid soaps, laundry fabric softener, enzyme products, cold water detergents, concentrated powders, and most recently super-concentrated detergents, gels, and refills.

Why we use cleaning products is obvious, for personal cleanliness and health. From the very beginnings of washing off dirt and mud, to the start of the Middle Ages, most cleaning compounds were made from mixes of ashes, animal or plant fats, and oils. The fall of the Roman Empire prior to the Middle Ages led to reduced cleanliness and catastrophic diseases. By the 17th Century, bathing and cleanliness experienced a renewal.

Over later centuries, soap was considered to be a luxury item, and was taxed. When it became affordable, the general public began to benefit again from the use of soaps. During the early to middle 1800's, soap chemistry was studied and improved. Costs were reduced, soaps were even more affordable to all, and usage spread.

The availability of washing machines in the early 1900's helped increase the use and popularity of soaps, and led to modern developments in soap chemistry. Following World War II, detergents gained in popularity over soaps, and are now used liberally. The importance of soaps, hand soap and cleanliness for disease prevention is another reason for educating the public about using soap products.

Today's cleaning products not only are safer for public use, but also for the natural environment. Up to date chemical research has led to the development of modern detergents and cleaners used in janitorial and cleaning services worldwide.

There is an abundance of new cleaning products for every purpose at home or in commercial use. Soaps and cleaners are used in bathrooms, kitchens, and public businesses to help assure safety and disease control. People are aware of the dangers of germs every time a major disease occurs, or an epidemic is threatening a population.

Medical advisers recommend frequent hand washing as the first step in preventing flu, colds, and other commonly found diseases. Hand washing is the number one step taken in the medical community to avoid spreading germs around hospitals, clinics, and industrial locations. The minimum time for effective handwashing is 20 seconds.

Safer chemical products are available that have less impact on the environment and that are eco-friendly. Low suds, cold water, and fragrance free products help the green movement, and address some allergenic problems people may have.

Obtaining the vast array of new cleaning products and general product knowledge has never been easier, thanks to the Internet and easy access to large cleaning and janitorial product service and supply companies.[1]

The most effective cleaning products used in the commercial cleaning industry today are as follows:

- 3rd Party certified green chemicals
- HEPA Filtered commercial grade vacuums
- Disinfectants and quat-sanitizers along with easy to use dispensing systems
- HOCl on-demand dispensing systems
- Autoscrubbers and orbital machines
- Micro-fiber towels, mops and dust mops
- Hydrogen peroxide chemicals
- Wet & Dry vacuums
- Industrial floor machines / flood pads and floor cleaning chemicals
- Diamond embedded floor pads
- Aqueous ozone water based sanitizing
- Odor control products
- Anti-splatter urinal screens and mats
- IAQ - Air filtration and disinfecting
- Alcohol based sanitizers
- Carpet cleaning machines, odor neutralizing chemicals and encapsulation chemical technology
- Foaming soap and sensor hands free dispensers
- Wringer mop buckets
- Synthetic vinyl and nitrile gloves
- High density and low density can liners with star seals
- Polypropylene bristle push brooms and warehouse brooms
- Robotic equipment

1 SOURCE: Cleanitsupply.com

AIR QUALITY

The industry's newest buzzword is Air Indoor Quality-AIQ. Current research has shown covid and viruses are more likely to be transmitted by air than on a surface. We already knew what triggers asthma, allergies and cold /flu does affect our AIQ.

"Indoor air quality" refers to the quality of the air in a home, school, office, or other building environment. The potential impact of indoor air quality on human health nationally can be noteworthy for several reasons:

Indoor concentrations of some pollutants have increased in recent decades due to such factors as energy-efficient building construction (when it lacks sufficient mechanical ventilation to ensure adequate air exchange) and increased use of synthetic building materials, furnishings, personal care products, pesticides, and household cleaners.

Typical pollutants of concern include:

- Combustion by products such as carbon monoxide, particulate matter, and environmental tobacco smoke.
- Substances of natural origin such as radon, pet dander, and mold.
- Biological agents such as molds.
- Pesticides, lead, and asbestos.
- Pollen
- Ozone (from some air cleaners).
- Various volatile organic compounds from a variety of products and materials.

Most pollutants affecting indoor air quality come from sources inside buildings, although some originate outdoors.

INDOOR SOURCES (SOURCES WITHIN BUILDINGS THEMSELVES).

Combustion sources in indoor settings, including tobacco, wood and coal heating and cooking appliances, and fireplaces, can release harmful combustion byproducts such as carbon monoxide and particulate matter directly into the indoor environment.

Cleaning supplies, paints, insecticides, and other commonly used products introduce many different chemicals, including volatile organic compounds, directly into the indoor air. Furniture, carpeting or flooring and even floor finishes can add to poor AIQ.

Building materials are also potential sources, whether through degrading materials (e.g., asbestos fibers released from building insulation) or from new materials (e.g., chemical off-gassing from pressed wood products). Other substances in indoor air are of natural origin, such as radon, mold, and pet dander.

OUTDOOR SOURCES

Outdoor air pollutants can enter buildings through open doors, open windows, ventilation systems, and cracks in structures. Some pollutants come indoors through building foundations. For instance, radon forms in the ground as naturally occurring uranium in rocks and soils decays. The radon can then enter buildings through cracks or gaps in structures.

Harmful smoke from chimneys can re-enter homes to pollute the air in the home and neighborhood. In areas with contaminated ground water or soils, volatile chemicals can enter buildings through the same process.

Volatile chemicals in water supplies can also enter indoor air when building occupants use the water (e.g., during showering, cooking).

Finally, when people enter buildings, they can inadvertently bring in soils and dusts on their shoes and clothing from the outdoors, along with pollutants that adhere to those particles. Entrance matting can aid in keeping a building cleaner and healthier

Health effects associated with indoor air pollutants include:

- Irritation of the eyes, nose, and throat.
- Headaches, dizziness, and fatigue.
- Respiratory diseases, heart disease, and cancer.

The link between some common indoor air pollutants (e.g., radon, particle pollution, carbon monoxide, Legionella bacterium) and health effects is very well established.

Radon is a known human carcinogen and is the second leading cause of lung cancer.

Carbon monoxide is toxic, and short-term exposure to elevated carbon monoxide levels in indoor settings can be lethal.

Episodes of Legionnaires' disease, a form of pneumonia caused by exposure to the Legionella bacterium, have been associated with buildings with poorly maintained air conditioning or heating systems.

Numerous indoor air pollutants—dust mites, mold, pet dander, environmental tobacco smoke, cockroach allergens, particulate matter, and others—are "asthma triggers," meaning that some asthmatics might experience asthma attacks following exposure.

While adverse health effects have been attributed to some specific pollutants, the scientific understanding of some indoor air quality issues continues to evolve.

One example is "sick building syndrome," which occurs when building occupants experience similar symptoms after entering a particular building, with symptoms diminishing or disappearing after they leave the building. These symptoms are increasingly being attributed to a variety of building indoor air attributes.

Researchers also have been investigating the relationship between indoor air quality and important issues not traditionally thought of as related to health, such as student performance in the classroom and productivity in occupational settings.

Another research area that is evolving is "green building" design, construction, operation, and maintenance that achieves energy efficiency and enhances indoor air quality.

Though much is known about the broad range of indoor air quality issues and associated health effects, currently only two national indicators of indoor air quality are available based on long-term and quality data: Radon and Serum Cotinine (a measure of exposure to tobacco smoke).

With the covid outbreak everyone started purchasing stand alone airpurifiers. Most of these are just hepa filters. These typically are great at reducing dust and pollen , but were marketed as doing a lot more. The more expensive products use a combination of layered filters with carbon, hepa, UVC Led light and maybe titanium dioxide. These can kill bacteria and viruses if properly maintained and space allocations are followed.

Children are more susceptible to air pollution because they breathe a greater volume of air relative to their body weight. To make matters worse, schools tend to be at a higher risk of poor indoor air quality because they can have 4 times the occupants as a regular office building for the same amount of floor space and generally less maintenance, making air quality in schools an area of a particular concern.[1]

A cleaning for health vacuuming strategy – with an efficiently filtered vacuum cleaner – can help schools reduce asthma triggers by removing (rather than redistributing) the dust in a building. HVAC improvements and/or stand alone air filtration with a Merv rating of 13 or higher will improve the AIQ

Programs that promote healthy indoor air quality (IAQ) can:

- Improve Health
- Increase Students' Ability to Learn
- Improve Test Scores
- Improve Adult Productivity in the School System

Maintaining healthy physical conditions and good environmental quality in schools can yield a high rate of return on academic outcomes.[2]

AIR QUALITY FACTS TO CONSIDER[1]

- Indoor Air Quality is worse than Outdoor Air Quality by 2-5 times
- 90% – The amount of our lifetime, on average, we spend indoors.
- 1,000 – Number of people that can get sick from viral airborne particles that cover just a tip of a pen.
- 17,000 – Number of breathes an average human takes a day, breathing in 2,000 gallons of air.
- 51,000 – Number of breaths kids under 10 years old take a day. 2 – 3X more breaths than adults.
- 30,000 – Number of droplets a sneeze can release and travel in the air up to 200 miles per hour.
- 100,000 – Number of particles a person sends into the air with each footstep.
- 13,800,000 – Number of school days missed each year due to poor indoor air quality.
- 37,000,000 – Number of bacteria humans shed per hour.
- 75,000,000 – Number of Americans impacted with allergies or asthma.
- 95% of HVAC air is recycled with 5% being fresh air
- Sources are CDC, EPA, American Lung Assoc, Healthy schools campaign

1 Source CDC, EPA, American Lung Assoc, Healthy schools campaign

1 Source https://www.epa.gov/indoor-air-quality-iaq/schools-and-indoor-air-quality
2 Source: https://www.epa.gov/iaq-schools/why-indoor-air-quality-important-schools

AIR INDOOR QUALITY (AIQ)

There are several ways to combat poor AIQ.

- Run HVAC more often
- Add better air filtration
- Add fogger disinfection
- Add UV Light - Limited affect for AIQ

The best rating for HVAC filters is MERV (Minimum Efficiency Reporting Value) 19, although most systems can't run above MERV 13. Some floor standing or wall units can supplement HVAC systems to reach the higher level.

There are a lot of myths and half-truths when it comes to air filtration. Most units will either let viruses pass through or they trap them inside but do not kill them. These require extra precaution when changing filters to limit exposure. To add extra air filtration, portable HEPA units are the bare minimum requirements. Since bacteria and virus' are smaller than .3 microns, the HEPA will treat dust, smoke, etc. To kill bacteria and virus' you need units that include UVC and/or UVA lights and titanium dioxide to kill down to .1 micron.

Foggers can emit a dry or moist solution that will destroy odors and disinfect the air and possibly all surfaces. This is more effective than electrostatic spraying and several different chemicals are available to use.

UV lights, either ceiling mounted or portable, can destroy bacteria, but cannot filter out and do an air exchange as the other systems described above. Furthermore, they only work by "line of sight" so anything that can't be seen by the light ray will be untouched.

AIRBORNE DISORDER

An airborne disorder is any disease that is caused by a microorganism that is transmitted through the air. There are many airborne diseases that are of clinical importance and include bacteria, viruses, and fungi. These organisms may be spread through sneezing, coughing, spraying of liquids, the spread of dust, or any activity that results in the generation of aerosolized particles. The microorganisms transmitted airborne may be spread via a fine mist, dust, aerosols, or liquids. The aerosolized particles may be generated from a source of infection, such as body secretions of an infected patient or even an animal. In addition, aerosols may be generated from biological waste products that accumulate in garbage, caves, and dry arid containers. During aerosolization, the microorganisms that are less than 100 microns in size float in the air. Sometimes, the microorganisms may be contained in dust particles that are present in the air. Once the droplets that contain microorganisms have been formed, they are then dispersed via air currents to varying distances and can be inhaled by susceptible hosts. The infected aerosolized particles often remain suspended in the air currents and may travel considerable distances, although many particles will drop off within the vicinity. As the distance traveled of the aerosol particle increases, the risk of infection starts to drop. Airborne precautions necessitate the prevention of infections and the use of available interventions in healthcare facilities to prevent the transmission of airborne particles. The airborne particles may remain localized to the room or move depending on the airflow. In some cases where there is inadequate ventilation, the airborne particle may remain in the hospital room and be inhaled by a newly admitted patient. The control and prevention of airborne transmission of infections are not simple. It requires the control of airflow with the use of specially designed ventilator systems, the practice of antiseptic techniques, wearing personalized protection equipment (PPE), and performing basic infection prevention measures like hand washing. This activity reviews the techniques for minimizing the spread of airborne diseases and the role of the interprofessional team in maximizing airborne precautions to minimize the spread of disease.

OBJECTIVES

- Describe the causes of airborne infections.
- Review how airborne diseases are commonly spread.
- Explain techniques to minimize the spread of airborne diseases.
- Outline the importance of collaboration and coordination among the interprofessional team can enhance patient care by maintaining airborne precautions which will improve patient outcomes for patients.

An airborne disorder is any disease that is caused by a microorganism that is transmitted through the air. Many clinically important airborne diseases are caused by a variety of pathogens, including bacteria, viruses, and fungi. [1] These organisms may be transmitted through sneezing, coughing, spraying of liquids, the spread of dust, talking, or any activity that results in the generation of aerosolized particles. It is important to be aware that airborne diseases, in general, do not include disorders caused by air pollution, poisons, smog, and dust.[2][3]

According to the World Health Organization, "Airborne transmission of infectious agents refers to the transmission of disease caused by the dissemination of droplet nuclei that remain infectious when suspended in air over long distance and time." Airborne transmission can be characterized as obligate or preferential depending on whether it is only transmitted via droplet nuclei or if it has multiple other routes of transmission.

The microorganisms transmitted by an airborne route may be spread via fine mist, dust, aerosols, or liquids. The aerosolized particles are generated from a source of infection, such as an infected patient or animal. In addition, aerosols may be generated from biological waste products that accumulate in garbage cans, caves, and dry arid containers. In aerosolization, the microorganisms that are less than 100 micrometers in size float in the air. These microorganisms, contained in droplets, are then dispersed via air currents to varying distances and can be inhaled by susceptible hosts. Although a majority of the particles will drop off within the vicinity, the infected aerosolized particles often remain suspended in the air and may even travel considerable distances. As the distance between the source and susceptible individuals increases, the rate of transmission decreases. Airborne transmission necessitates the use of available interventions in healthcare facilities to break the transmission of airborne particles from patient to patient and patient to healthcare workers. Airborne particles are considered highly infectious as they often remain suspended in the air and travel by air currents to different parts of the hospital, where there is a potential of them being inhaled by others. In some cases where there is inadequate ventilation, the airborne particle may remain in the hospital room for extended periods and may even be inhaled by a newly admitted patient.

The control and prevention of airborne transmission of infections are not simple; it requires the control of airflow with the use of specially designed ventilation systems, the practice of antiseptic techniques, wearing personalized protective equipment (PPE), and performing basic infection prevention measures like hand washing.

AIRBORNE ORGANISMS

In almost all cases, airborne pathogens cause an inflammatory reaction of the upper airways affecting the nose, sinuses, throat, and lungs. The involvement of these structures may result in sinus congestion, sore throat, and lower respiratory tract symptoms. Any coughing or sneezing activity may then generate aerosolized particles leading to airborne transmission. Some of the common pathogens that may spread via airborne transmission are:

- Anthrax
- Aspergillosis
- Blastomycosis
- Chickenpox
- Adenovirus
- Enteroviruses
- Rotavirus
- Influenza
- Rhinovirus
- Neisseria meningitidis
- Streptococcus pneumoniae
- Legionellosis
- Measles
- Mumps
- Smallpox
- Cryptococcosis
- Tuberculosis
- Bordetella pertussis
- Severe acute respiratory syndrome (SARS)
- Middle East Respiratory Syndrome (MERS)
- Coronavirus Disease 2019 (COVID-19)

This is a non-exhaustive list that only encompasses some of the common diseases that have been implicated in airborne transmission. A special note to be made is regarding COVID-19, the 21st-century pandemic which is thought to spread through airborne routes (among other routes) Active measures to prevent airborne transmission have been shown to curb its spread.

Airborne diseases are not exclusive to humans and can also infect animals. A notable example is poultry that is often affected by an avian disorder (Newcastle disease), which is also transmitted via an airborne route. However, it is important to understand that exposure to an animal or a patient with an airborne disease does not automatically ensure disease transmission. The infection also depends on the host's immunity, the amount of exposure, and the duration of exposure to the infected patient.

AIRBORNE DISEASES

Airborne diseases are caused by pathogenic microbes small enough to be discharged from an infected person via coughing, sneezing, laughing and close personal contact or aerosolization of the microbe. The discharged microbes remain suspended in the air on dust particles, respiratory and water droplets. Illness is caused when the microbe is inhaled or contacts mucus membranes or when secretions remaining on a surface are touched.

Transmission of airborne diseases can be greatly reduced by practicing social and respiratory etiquette. Staying home when ill, keeping close contact with an ill person to a minimum, allowing a few feet distance from others while ill, and wearing a mask, covering coughs and sneezes with elbow or tissue can greatly reduce transmission. Good hand washing can decrease spread of germ-containing droplets that could be picked up on hands from surfaces or hand contact with secretions. Environmental controls and engineering alternatives help reduce transmission of water droplet aerosolized pathogens.[1]

1 https://www.ncbi.nlm.nih.gov/books/NBK531468/

RESTROOM CARE

Businesses today must take restroom cleanliness more seriously than ever before. The recent spread of disease around our planet has been extraordinary. Statistics show that businesses who do offer clean public bathrooms to their patrons are in fact more successful. For example:

- A dirty/smelly bathroom is the number one reason Mothers won't return to a restaurant.[1]
- Studies show that 93% of restaurant customers surveyed consider a public restroom dirty if it has wet or sticky floors. Furthermore, 89% of those surveyed noted that odor is also a contributing factor that gives customers the perception that a restroom is dirty.[2]
- 4 out of 5 patrons were concerned about germs in public restrooms.[3]
- Studies show that unsanitary restroom will drive 90% of customers away.[4]
- 94% of adults would avoid a business in the future if they encountered dirty restrooms.[5]
- Lack of paper and soap supplies is another major complaint from customers

If a patron uses a public bathroom and it's dirty it leaves a bad first impression and can impact their willingness to do use that business' services or products especially if it's a restaurant. In order for businesses to compete today they must use every possible angle they can to lure in customers and if a customer had a dirty initial experience in that business' bathroom they typically won't spend their money there nor will they ever return. A fresh, clean environment is what all patrons are seeking in their time of bodily needs and if they feel comfortable and safe they are highly likely to return.

Proper restroom care for public bathrooms consists of the following:

Always start at the top and work down to the floor

FLOORS
the floors must be mopped, washed and disinfected. Grout holds odor and bacteria and should be cleaned at regular intervals

WALLS
the walls of the bathroom stalls and around the sink area must be wiped down and disinfected

1 Source: Technomic 2014
2 Source: Clean Link, Restroom Cleanliness 2017
3 Source: American Institute for Cleaning Sciences 2013
4 Source: Harris Interactive Survey 2008
5 Source: Company News, Industry News 2014
6 Wiz Kid Products

TOILETS / URINALS
the inside rim, seat and handle of the toilet as well as the urinal stall must be properly washed down and disinfected. Urinal Screens and mats are a good way to prevent the spread of migintis bacteria.[6] (See images below.) The use of antisplash urinal screens and urinal mats aid in both odor control and keeping urine from being tracked throughout the building.

SINKS
all of the sinks must be unclogged, washed, wiped down and disinfected.

DOORS
the doors, door handles and even the locks must be wiped down and disinfected.

TRASH
the trash must be emptied and new can liners must be lined inside of each trash receptacle.

ODOR CONTROL PRODUCTS
Any active or passive order controls systems should be inspected and replaced as needed.

MIRRORS
the mirrors must be cleaned with appropriate product.

RESTOCKING
Check all paper products and soap levels and that all dispensers are in working condition.

ODOR CONTROL

The use of odor control is no longer restricted to the restroom. Scent marketing is now used throughout a facility to promote calmness, cleanliness , odor control or transform you mentally to another place. Restaurants, hotels, Spas, Casinos, theme parks and offices use this to make you hungry, feel tropical and/or to promote happiness-wellbeing.

Active control systems use a power source to disperse the product throughout the room whereas, passive systems use natural airflow to disperse the fragrance. Passive systems benefit from windows or a/c systems to aid in the process. Some restrooms benefit from a combination of both systems, depending on the type and size of facility, and its individual needs.

Air fresheners are divided into products that scent the air and ones that actually destroy bad odors. For disinfecting the air, see the section titled "air quality." Odor control has moved from restrooms to lobbies, conference rooms, and even the entire facility. There are many different methods and brands of air fresheners. They include RTU aerosol spray cans, wicks, gels, and toilet bowl and wall clips. The newest method uses essential or synthetic oils. They are stronger per droplet and atomized to much smaller microns. Smaller droplets allow for longer hang time in the air for better results.

Another method of restroom odor control is to clean the grout, the drains and waterless urinals. This typically means adding enzymes to the urials and drains and restoring the grout to original color and freshness by aggressive scrubbing and chemicals. There are various acids and peroxide products that achieve this depending upon the soil load.

Fragrances have been used to mask odors since antiquity. A variety of compounds have been used over the past two millennia for their abilities to create pleasant aromas or eliminate unpleasant odors.

The first modern air freshener was introduced in 1948. Its function was based on a military technology for dispensing insecticides and adapted into a pressurized spray using a chlorofluorocarbon (CFC) propellant. The product delivered a fine mist of aroma compounds that would remain suspended in the air for an extended period of time. This type of product became the industry standard and air freshener sales experienced tremendous growth. In the 1950s, many companies began to add chemicals that counteract odors to their fragrance formulas. These chemicals, intended to neutralize or destroy odors, included unsaturated esters, pre-polymers, and long-chain aldehydes.

In the 1980s, the air freshener market shifted away from aerosols, due to concerns over the destruction of the ozone layer by chlorofluorocarbons (CFCs). Many other air freshener delivery methods have become popular since, including under the seat wafer air fresheners, scented candles, reed diffusers, potpourri, and heat release products.

ODOR CONTROL CATEGORIES

- **AIR MIST SCENTED BATTERY OPERATED DISPENSERS**
- **SCENTED NON-PARA BLOCKS IN URINALS**
- **SCENTED URINAL SCREENS IN URINALS**
- **SCENTED GEL BASED BATTERY OPERATED AIR FLOW DISPENSERS**
- **SCENTED AEROSOLS**
- **OZONE GENERATORS**

BASIC PRINCIPLES

The control of odors is addressed by five classes of mechanisms;

- Absorption: Adsorbents like zeolite, activated charcoal, or silica gel may be used to remove odors.
- Oxidation: ozone, hydrogen peroxide, peroxide, chlorine, chlorate and other oxidizing agents can be used to oxidize and remove organic sources of odors from surfaces and, in the case of ozone, from the air as well.
- Air sanitizer: Odors caused by airborne bacterial activity can be removed by air sanitizers that inactivate bacteria.
- Surfactants and soaps.
- Masking: Overwhelming an odor with another odor by any of the means described above.

Delivery of the above air freshener mechanisms falls into two broad categories: continuous action and instant action. Continuous action products include scented candles and devices which use a candle flame or some other heat source to heat and vaporize a fragrance formulation, incense burners, wall plug-ins which either use piezoelectric technology to aerosolize fragrance or heat to vaporize it, fragrance impregnated gels which release fragrance as the gel evaporates sometimes with the help of an electric fan, wick and reed diffusers which release fragrance by evaporation from fragrance-soaked wicks or wooden reeds; and fragrance impregnated materials like floor wax, paper, plastics, wood which release fragrance by off gassing; and lastly nebulization systems which convert liquid fragrances into a vapor in a cold process without the use of heat.

Instant action systems are mainly aerosol sprays, or atomizers. The aerosol spray uses a propellant and fragrance packaged under pressure in a sealed metal or glass container with a valve which is opened by pressing down a button which contains a spray nozzle – the actuator. When the container's valve is opened by pressing the actuator, fragrance is forced through the spray nozzle located inside the actuator to create a mist of droplets containing fragrance. These droplets are 30 to 50 micrometers in diameter. The atomizer is a glass, metal or plastic container of fragrance which operates in a similar fashion except that the actuator is a pump which when pressed a few times creates the pressure to aspirate the fragrance from the container through a tube into the actuator and spray nozzle. The mist created contains droplets 50 to 150 micrometers in diameter. A recently developed type of aerosol packages a plastic bag of fragrance into a can. The bag is attached to the valve/actuator/spray nozzle and sealed in the can surrounded by air under pressure. When the actuator is pressed, the valve opens and the liquid forced through the nozzle by the pressure around the bag. This is called "bag-on-valve" technology.

Air fresheners introduce fragrance into the air of interior spaces either as droplets which transition to vapor, or as the molecules of fragrance ingredients directly evaporating from a source. Fragrance diffuses into the air to mask other odors or to introduce a specific odor.

In 2020 air fresheners (as well as cleaning solutions and products used to clean cars) will need to list any of their ingredients which are on California's list of 2,300 harmful chemicals, based on a California law passed in 2017. A California study in 2006 found that the prominent products of the reaction of terpenes found in air fresheners with ozone included formaldehyde, hydroxyl radical, and secondary ultrafine particles.[6] It is not clear if manufacturers will need to list such chemicals which are not ingredients, but form when the air freshener is placed in the air.

VIBE® Cabinet


VIBE® Open

Removing the source of an unpleasant odor will decrease the chance that people will smell it. Ventilation is also important to maintaining indoor air quality and can aid in eliminating unpleasant odors. Other solutions are bad smells removers that are adapted to different types of odor. The result is odor-free air that is also pollution-free and safer to breathe. Some house plants may also aid in the removal of toxic substances from the air in building interiors.[1]

1 Partial Source: Wikipedia

TOWEL & TISSUE

Tissue paper products, which include paper towels and toilet paper, play an important role in modern life. They contribute to improved hygiene, comfort and convenience in our society. Tissue paper products are highly engineered to provide strength, ultra-light weight, softness and absorbency, all at the same time.

Rolls of toilet paper were first introduced in the late 1800s and facial tissue made its debut in the 1920s. Today, tissue paper products are a popular, growing market. Demand for various tissue products continues to increase in the U.S. and abroad. Innovations in tissue and towel products have led to new product applications to meet the changing demographics of on-the-go millennials and today's families.

WHAT IS TISSUE?

Tissue is a general term indicating a class of papers which are characteristically gauzy in texture and, in some cases, fairly transparent. They may be glazed, unglazed, or creped, and are used for a variety of purposes.

Tissue can be manufactured using trees that are turned into wood chips and then cooked to separate the fiber (cellulose) from the glue that holds the tree together. This fiber is then formed into a sheet and ultimately into tissue. Tissue can also be manufactured from recycled paper products, or a combination of fresh fiber and recycled fiber. Most mills in the U.S. that produce tissue use some recycled paper products to make new tissue paper products.

Examples of different types of tissue paper products include toilet, facial, napkin, towels, wipes, and special sanitary papers. Desirable characteristics in these types of tissue papers are softness, strength, comfort, thickness and freedom from lint.

Other examples of tissue papers are decorative and laminated tissue papers and crepe papers, often used in gift wrapping and to decorate. Desirable characteristics here are appearance, strength, and durability.

WHAT KINDS OF PRODUCTS ARE MADE FROM TISSUE?

Tissue papers are divided into three major categories: At-Home (or Consumer), Away-from-Home (or Commercial & Industrial), and Specialty.

- At-Home products: Also known as Consumer Products, these are the tissue products you purchase in the grocery store, the convenience store and mass merchandisers for use in your home and include toilet paper and facial tissue, napkins and paper towels, wipes, and other special sanitary papers. For these products, softness and brightness are often high priorities. These products may also be decorated, multi-ply, scented, or contain emollients or lotions for added comfort and desirability.
- Away-from-Home products: Also known as Commercial & Industrial Tissue, these are the products that serve markets such as hospitals, restaurants, schools, businesses and other institutions. These tissue paper products are often produced in large sizes, with dispensers designed for high volume, public use.

Three of the most commonly used applications of tissue products are paper towels, toilet paper and facial tissue.

- Paper Towels: Paper toweling is folded or rolled sheets used for drying or cleaning where quick absorption is required. Paper towels are often embossed during the converting process for additional cleaning strength or absorption. Paper towels can be made from virgin pulp or recycled paper products or maybe a combination of the two. The various types include multi-fold, single-fold, center pull and roll towels.
- Toilet Paper: Based on the desire for better public hygiene, toilet tissue evolved along with the advent of indoor plumbing. Toilet tissue on a roll was introduced to North America in 1890 by Scott Paper Company. Designed to be sewer and septic safe, toilet tissue is an essential product of everyday life, providing sanitation, comfort, and convenience with each use.
- Facial tissue: The class of soft, absorbent papers in the sanitary tissue group. Originally used for removal of creams, oil, and so on, from the skin, it is now used in large volume for packaged facial tissue, toilet paper, paper napkins, professional towels, industrial wipes, and for hospital items. Desirable characteristics are softness, strength, and freedom from lint.

ARE TISSUE PRODUCTS SUSTAINABLE?

Tissue products are inherently sustainable. Whether they are made from sustainably harvested wood fiber trees or recycled paper, demand for tissue products ensures that the resources used to make them will be plentiful for generations to come. In addition, the U.S. paper and wood products industry voluntarily makes efforts to continuously improve upon its sustainability record. Recently bamboo paper has entered the market. The benefits are rapid sustainable growth, strength and non-bleached so the color is a natural brown.

- Tissue manufacturers drive demand for recycled fiber. In 2014, most U.S. mills with tissue paper capacity used some recycled paper to make new tissue products and several of those mills used only recycled paper.
- On average, about two-thirds of the energy used by pulp and paper mills comes from renewable sources such as byproducts like carbon-neutral biomass that would not otherwise be used in the tissue paper making process.
- Tissue manufacturers continue to further reduce greenhouse gas emissions from their facilities through efforts like reducing the use of fossil fuels and purchased energy (such as purchasing power from a local utility company), and reducing truck transportation.
- In U.S. pulp and paper mills, water is used ten times, on average, before it is sent to a wastewater facility for treatment.

Tissue products are diverse, widespread and help to improve the quality of people's lives around the world every single day. Tissue products provide value in many ways and have helped to create modern life.

TOWEL & TISSUE GLOSSARY

ABSORBENCY (OR ABSORBANCY), RATE OR CAPACITY – A measure of how a material or product picks up and holds a liquid, usually water or oil. The two most important components of absorbency are rate and capacity. The rate of absorption is a measure of how fast a specific amount of liquid penetrates the material. The absorptive capacity is a measure of the quantity of liquid that the material can hold.

BASE PAPER – Paper before it is embossed, or before it is processed by any other finishing or converting operation.

BASIS WEIGHT – Weight per unit area of a paper product. Reported in grams per square meter (gsm) or pounds per ream. Embossing may decrease the basis weight slightly, due to the growth in the machine direction that it may cause.

BATH TISSUE – Also called bathroom tissue, loo paper (in UK), toilet paper, or just TP. Its primary use is to clean and/or dry the skin after eliminating bodily wastes. It is supplied in roll form in most of the world, perforated for easy dispensing. Embossing is used to increase bulk, absorbency, softness, and product roll size.

BLENDED TOILET PAPER – Is a blend of both recycled tissue and virgin tissue.

BULK – A measure of the height of a stack of paper. The number of layers in the stack varies from company to company, as well as what constitutes a single layer.

CDT – Short for Cross Direction Tensile strength. See cross direction and tensile strength.

CDWT – Short for Cross Direction Wet Tensile strength. See cross direction and tensile strength.

COIN-EDGE – A special embossing pattern normally seen around the edges of a dinner napkin or cocktail napkin. Its purpose is partly decorative and partly for ply bonding. Also see paper napkin.

CONVERTING – A process which reduces a large sized parent roll provided by a paper machine into usable small sized rolls or folded products.

CROSS DIRECTION (CD) – Cross machine direction, which is perpendicular to the direction of the flow of the material that is running through a machine. Almost all of the rollers in the machine have axes that are aligned in the CD. Both cross direction (CD) and machine direction (MD) are in the plane of the material, whereas Z direction (ZD) is perpendicular to the plane of the material.

EMBOSSING – To change the shape of a thin material or sheet from flat to shaped, so that there are areas that are raised and/or recessed from the rest of the surface, usually without rupturing the material.

FACIAL TISSUE – An absorbent tissue paper product primarily used on the face. There are some people (not in the paper industry) who call it Kleenex® (which is a trademark and brand name owned by Kimberly Clark). Softness is highly valued in facial tissue, and especially in the "ultra premium" category. Embossing on facial tissue can make it feel thicker or plusher and more absorbent. Many facial tissues have special materials added to improve the consumer's experience of the softness, through a process called lotionizing.

FINISHING – A group of processes which add value by changing the intrinsic properties of the paper after the paper is formed and dried, after all of the papermaking processes have ended. Examples include embossing, calendering, printing, lotionizing, laminating, etc. Most finishing processes are done on converting machines. For more in-depth information about finishing processes, please see the article "Adding Quality Through Finishing Processes" by Carl Ingalls, which was presented at Tissue World Americas 2002 in Miami on 1 October 2002.

JUMBO ROLL TISSUE (JRT) – Refers to an X-large roll of toilet paper that requires a special dispenser in a restroom stall to hold the large diameter or toilet tissue. JRT is typically made as a 1 or a 2 ply thickness or caliper and has an inner-paperboard core.

LAMINATING – A process which combines two or more plies of material with a strong bond (stronger than provided by ply bonding), and is used on some paper towel and bath tissue products. Laminating that is combined with embossing in a single unit is often called double-nip embossing laminating.

LOTIONIZING – A process which improves the perception of the softness of a paper product by the application of an invisible substance onto its surface. The substance is often an oil, a wax, or a silicone. This is most often applied to facial tissue. One disadvantage is that the lotion can interfere with some ply bonding methods.

MD – Short for machine direction.

MDT – Short for Machine Direction Tensile strength. See machine direction and tensile strength.

MDWT – Short for Machine Direction Wet Tensile strength. See machine direction and tensile strength.

MICRO EMBOSSING – Embossing with a very fine pattern, sometimes with the purpose of simulating the textured appearance of a TAD product, or for creating a visual impression of a textile fabric. Pattern fineness is often characterized by the density of embossing elements (number of elments per unit area). Micro embossing is sometimes combined with (used as a background) spot embossing and/or quilting.

MICRO-CORE – Refers to the small diameter of the paperboard roll core inside of a roll of toilet paper. Micro-Core toilet paper is typically made as a 1 or a 2 ply with about a 4" width and is used in porto-potties or other commercial restroom applications.

NESTED EMBOSSING / LAMINATING (REGISTRATION) – One of several ways in which two layers or plies of embossed product are brought together in a laminating nip for a general process known as double-nip embossing laminating. Nested lamination means that the raised elements of each layer fit between each other in the product, as in interdigitating, so that the tops of each element come into contact with the recessed area (or floor) of the opposing layer.

NESTING INSIDE A ROLL OF PRODUCT OR A STACK OF PRODUCT – Nesting is when the embossing elements of one layer of product fit into the embossing elements of the layer above or below it, similar to the way that bowls are stacked on a shelf, which causes them to take up less space. This normally only occurs with single-nip embossing. In a roll product, this usually occurs in alternating bands of nesting and anti-nesting, which is described and illustrated in the article "Using Laser Engraving in Tissue Embossing" by Carl Ingalls and Ed Giesler.

PAPER NAPKIN – An absorbent tissue paper product used with food, and usually provided as a stack of folded sheets. The most common paper napkin product categories are: lunch, luncheon, or family; beverage or cocktail; dinner; and decorative or floral. All of these categories are most often embossed in a single nip. The least expensive lunch napkins may be made with multiple streams of single-ply paper running through the same embossing nip with an overall embossing design, and then the plies that were embossed together are separated into single plies before each ply is quarter-folded and stacked. Dinner napkins are often embossed with a coin-edge plus a decorative border, two or more plies, and many different types of folding patterns. The purpose of embossing on paper napkins is largely decorative, and partly functional (ply bonding and bulk building). Many paper napkins are printed with high quality color printing. Decorative napkins often use edge-to-edge printing, which requires special embossing and ply-bonding considerations.

PAPER TOWEL – An absorbent tissue paper product whose primary use is to absorb liquid, and is most often used to dry hands. It must have very good absorbency capacity, and must remain strong even when wet (a property known as wet strength). The purpose of embossing on paper towel is mostly functional and only partly decorative. Embossing is used to increase the absorbency of paper towels. For the consumer market, embossing is also used to increase the diameter of a roll of product (not desired in the commercial market).

PARENT ROLL – A large roll of paper, also called a jumbo roll, that is unwound into a machine that processes the paper in some way. In the absorbent tissue paper industry, these processes are often called finishing processes. For a multi-ply product, there may be more than one parent roll being unwound into the machine, or the parent roll may have been wound with multiple plies (using a separate rewinding process). In some special cases, the plies are bonded together by some means (see ply bonding) before being wound into the parent roll.

PERF-EMBOSSING – Embossing by a method that creates a pattern of very small ruptures at precisely controlled locations within the material. This process was invented at Scott Paper Company decades ago and was originally used for ScotTowels® (trademark now owned by Kimberly Clark). Both embossing rollers in perf-embossing are usually engraved with the same pattern of discrete, raised, male elements, and the pattern is designed so that these elements pass between each other when the rollers are engaged in a nip. This is also known as interdigitating embossing.

PRIVATE LABEL – Is a term used to describe custom printed cases that have either a distributor and or an end user's name on the outside of the case.

QUARTER-FOLDED – Folding into quarters, by folding in half once along one axis (usually the MD first), and then folding in half once along a perpendicular axis. Most common for paper napkins. Also see folding.

QUILTING OR QUILTED EMBOSSING – A type of embossing design which gives the general impression of a quilt, usually by incorporating pattern features which suggest a network or lattice of continuous or connected stitching lines, and with open areas between the stitch lines that appear to puff up as a quilt often does. Quilting is often combined with spot embossing (a signature boss) and/or micro embossing. Another type of embossing design is overall embossing.

REAM – A quantity of paper, measured by area. For fine papers (not intended to be absorbent), one ream is usually 500 sheets. For absorbent tissue papers, one ream can equal 2880 square feet or 3000 square feet, depending upon the company.

LOOK FOR THESE CERTIFICATIONS

Made from Recycled content	Green Seal	Verus Carbon Neutral	Forest Stewardship Council (FSC)	Programme for the Endorsement of Forest Certification (PEFC)	Sustainable Forestry Initiative (SFI)	Ecologo

TOWEL & TISSUE GLOSSARY (CONTINUED)

RECYCLED TOILET PAPER – Is toilet paper made from 100% recycled fibers.

RIDGING – The appearance of a series of circumferential ridges and valleys around a roll of product, where the roll appears to be corrugated like a tin can. The height and spacing of the ridges is very uniform. This is often considered a sign of poor product quality, and is usually caused by the design of the embossing pattern.

ROTARY EMBOSSING – Embossing by passing the material between two rotating cylinders that press the embossing pattern into the material. This is the best process for continuous embossing with a seamless pattern.

SOFTNESS (OR HANDFEEL) – The user's experience of the feel of the material and how it yields to the touch. This is extremely important for premium-quality bath tissue and facial tissue products.

SPLIT CORE – is another type of toilet paper with a special inner paperboard core that splits when the roll is empty to allow the roll from above to drop down into the dispenser slot for the consumer to access and use.

TAD – Acronym for Through Air Dried, which is a special tissue papermaking technology that produces desirable lower density for the same strength, resulting in better bulk, absorptive capacity,and softness for the same amount of fiber (basis weight). The TAD fabric that carries the paper through this part of the paper machine leaves a characteristic impression in the tissue paper that looks like very fine and very faint embossing (see micro embossing). This technology is being used on bath tissue and paper towels, but only rarely (if ever) on paper napkins or facial tissue. More conventional tissue papermaking technologies include: Light Dry Crepe (LDC) and Heavy Wet Crepe (HWC). An embossing pattern that works well with one papermaking technology usually does not work as well with a different papermaking technology.

TENSILE STRENGTH - The strength of a material when tested by pulling, in a tensile testing machine. In the absorbent tissue paper industry, this is usually reported as the maximum load that a one-inch (or 25mm) wide specimen will bear before it tears or breaks, and is usually averaged over a number of specimens. The test can be done while the paper is dry or re-wetted (see wet strength). In most products, the test result is very dependent upon which direction the paper is pulled. In paper products, the machine direction tensile strength (MDT) is usually much greater than the cross direction tensile strength (CDT), and the ratio of MDT divided by CDT is called the "tensile ratio". There are two other measurements that are often provided by the machine that performs the tensile test: stretch and energy. Machine direction stretch (MDS) is important for runnability in converting, and is reported as the percentage of elongation of the test specimen at the moment that peak load occurred.

THICKNESS (CALIPER) - Thickness and caliper may refer to a single layer (one sheet of product or one ply of paper), whereas bulk often refers to a stack of layers. It is difficult to directly measure the thickness or caliper of a single layer of an absorbent tissue paper. The surface is highly irregular, the paper may contain a few small wads or fiber clumps that are thicker than the rest of the paper, and there may be very thin areas or holes. The most common method of measuring the thickness of a material is to place it between two parallel rigid flat plates that are pressed together with a predefined force. The distance between the plates is reported as the thickness or caliper of the material. Note that this method can be very sensitive to a few high points. Also, the test result can be very dependent upon the pressure that is applied to the material by the plates. The increase in the measured thickness before and after embossing is often greater when a lighter compressive force is used.

TISSUE PAPER – Paper that is very light in weight. There are two basic categories of tissue paper: wrapping tissue and absorbent tissue. Wrapping tissue paper is stronger, thinner, denser, and less porous than absorbent tissue paper, and is very rarely embossed. Products like bath tissue, facial tissue, paper towel, and paper napkin are made from absorbent tissue paper, and are often embossed to improve their physical properties, appearance, and softness.

TOILET SEAT COVER (TSC) – Refers to very thin virgin or recycled paper shinned up by heavy production rollers in the factory to make the paper almost translucent. TSC's are used as a protective barrier on a toilet seat in public restrooms.

VIRGIN TOILET PAPER – Is toilet paper that is made from 100% virgin paper tissue.

WET STRENGTH – The strength of a paper product when saturated with water, as determined by tensile testing.

Z DIRECTION (ZD) – Perpendicular to the plane of a material, the direction which is thinnest. If the material were placed flat on a horizontal surface, then the Z direction would be vertical. Also see machine direction (MD) and cross direction (CD).

CLEANING CHEMICALS

This is a broad category that encompasses general cleaning chemicals such as neutral cleaners, soap, window and carpet cleaners. Another category is specialty cleaners like degreasers, disinfectants, graffiti removal, mold/mildew and hard water deposits. Finally- floor finishes, floor strippers and concrete grinding and polishing can be a specialty class by itself.

What is the history of soap? And where did cleaning come from? This history of soap is a long one, dating back thousands of years to Ancient Babylon. Humans have built on that knowledge to create the soaps and detergents we use to clean dishes, laundry, our homes and ourselves today.

Evidence has been found that ancient Babylonians understood soap making as early as 2800 BC Archeologists have found soap-like material in historic clay cylinders from this time. These cylinders were inscribed with what we understand as saying, “fats boiled with ashes” (a method of making soap).

WHEN WAS SOAP INVENTED?

2800 BC. Records show ancient Egyptians bathed regularly. The Ebers papyrus, a medical document from about 1500 BC describes combining animal and vegetable oils with alkaline salts to form a soap-like material used for treating skin diseases, as well as for washing. Many other ancient civilizations also used early forms of soap. Soap got its name from an ancient Roman legend about Mount Sapo. Rain would wash down the mountain mixing with animal fat and ashes, resulting in a clay mixture found to make cleaning easier. By the 7th century, soap-making was an established art in Italy, Spain and France. These countries were early centers of soap manufacturing due to their ready supply of source ingredients, such as oil from olive trees.

But after the fall of Rome in 467 AD, bathing habits declined in much of Europe leading to unsanitary conditions in the Middle Ages. The uncleanliness of that time contributed heavily to illness, including the Black Death, which occurred in the 14th century.

Still there were areas of the medieval world where personal cleanliness remained important. Daily bathing was a common custom in Japan during the Middle Ages in Europe. And in Iceland, pools warmed with water from hot springs were popular gathering places on Saturday evenings.

The English began making soap during the 12th century. Commercial soap making began in the American colonies in 1600, but was for many years a household chore rather than a profession.

It was not until the 17th century that cleanliness and bathing started to come back into fashion in much of Europe, particularly in the wealthier areas.

Well into the 19th century, soap was heavily taxed as a luxury item in several countries. When the tax was removed, soap became available to most people, and cleanliness standards across societies improved.

A major step toward large-scale soap making occurred in 1791 when a French chemist, Nicholas Leblanc, patented a process for making soda ash from common salt. Soda ash is obtained from ashes and can be combined with fat to form soap. This discovery made soap-making one of America’s fastest-growing industries by 1850, along with other advancements and development of power to operate factories.

In 1898, B.J. Johnson developed the first formula for liquid soap. Since it was made of palm and olive oils, he called it ‘Palmolive.’ It was an instant hit. The first liquid soap for household cleaning followed; it was made from pine oil, and was branded as ‘Pine-Sol.’

VARIETIES OF SOAP

African black soap	Castile soap	Marseille soap	Saltwater soap	
Aleppo soap	Cuticura soap	Melt and pour	Shaving soap	Sugar soap
Amphiphile	Glycerin soap	Nabulsi soap	Soap shaker	Total fatty matter
Antibacterial soap	Gossage	Phisoderm	Soaper	Unsaponifiable
Azul e branco soap	Hard soap	Popish soap	Sodium stearate	Vegan soap
Bulnesia sarmientoi	Derreck Kayongo	Rebatching	Stack Soap	
Carbolic soap	Lye	Resin soap	Stainless steel soap	

During WWI, the animal fats that were still used to make soap were in short supply, so chemists in Germany created a cleaning chemical made from synthetic, as opposed to natural, ingredients. The result? The first detergent.[1]

In today's janitorial world there are several types of soap and/or sanitizers and the associated dispensing systems. The main soaps are liquid, Foam, gel and industrial. Powdered soaps are still available, but they are waning in availability. There are regular soaps in a variety of colors and fragrances, fragrant-free/dye-free soaps for green applications and sensitive skin as well as antibacterial soaps. Industrial soaps are more viscous and most of them have synthetic grit or crushed walnut shells for the scrubbing action.

HAND SANITIZERS-

There are 2 formulas within the various brands of hand sanitizers. The formulas consist of either Alcohol or non alcohol as the sanitizing agent. These are found in gel, foam and spray applications.

Alcohol And Non-alcohol sanitizers. Alcohol has the advantage that it is more readily available in all kinds of retail outlets. Typically, it is 62% but can vary up to 75% for the healthcare industry. It is also the preferred method by the CDC. Non-alcohol uses BZK (Benzalkonium Chloride) as its killing agent. Both are effective, but for school-age children with cuts and scrapes and prisons where alcohol is banned, it is a great alternative.

1 SOURCE: Cleaning Institute.org

WHAT IS THE DIFFERENCE BETWEEN CLEANING, SANITIZING, AND DISINFECTING?

Proper disinfecting is a 2 step process! One must clean dirty soil loads off a surface. If the disinfectant can reach the surface, it cannot be disinfected in that spot. Before choosing a cleaning or antimicrobial product, you will first need to decide whether the surface needs to be cleaned, sanitized, or disinfected. In most cases, you will need to clean a surface before you sanitize or disinfect. But it doesn't make sense to disinfect something that only needs to be cleaned. The products used to disinfect are more toxic and/or more expensive than products used just to clean. Overusing antimicrobial products like sanitizers and disinfectants may also lead to the spread of "superbugs." Superbugs are germs that are not easily killed by disinfectants and/or antibiotics. The CDC provides the following guidance on the differences between cleaning, sanitizing, and disinfecting.

CLEANING

- Reduces germs, dirt, and impurities by removing them from surfaces or objects. Dirt and organic material make some disinfectants less effective, so cleaning is necessary before disinfecting in most cases.
- Works by using soap or detergent and water to physically remove germs from surfaces. This process does not necessarily kill germs.
- Lowers the risk of spreading infection by washing germs down the drain. u Has been shown to remove up to 98% of bacteria and 93% of viruses from surfaces using microfiber and water in tests published by the EPA.
- Removes the food and water that allow germs to survive and reproduce.
- Removes dust, molds, irritants, andallergens that can trigger asthma symptoms.

SANITIZING

Sanitizing is the use of a chemical product or device (like a dishwasher or a steam mop) that reduces the number of germs on surfaces or objects to a level considered safe by public health standards or requirements. Sanitizing kills most germs but not all of them and is targeted to a select group of bacteria.

- For food service, a sanitizer should reduce the number of germs on a surface by 99.999% within 30 seconds.
- For hard surfaces not used for food service the level should be at least 99.9%.
- Sanitizing products should state on their label the surfaces they are intended to be used on.
- Sanitizing does not necessarily clean dirty surfaces or remove germs. Most sanitizers, as well as disinfectants, require a clean surface in order to be effective at killing germs.

DISINFECTING

Disinfecting uses chemicals to kill 99.999% of germs on hard, non-porous surfaces or objects.

- Does not necessarily clean dirty surfaces or remove germs;
- Kills germs on contact (when the disinfectant sits visibly wet, or "dwells," on the surface for a specified length of time) after the surface has been cleaned;
- Only works on hard, nonporous surfaces. Carpets and upholstery and other porous surfaces cannot be sanitized or disinfected with a chemical product;
- Is temporary! As soon as a surface has been touched or coughed, sneezed or breathed on, germs start growing on it again. Some germs are very hard to kill, while others are easily killed by many disinfectants, and even plain soap.

Dispensing systems can be open or closed systems. Open systems mean any soap can be poured into the dispenser. These are problematic since you can inadvertently mix pink and white soap into the system. Also, every time you open them, the air is allowed in which can promote mold and bacteria.

Closed systems mean they are proprietary to that brand and either cartridges or bags are replaced as needed. No chance of air or mixing can occur. These dispensers can be hands-free or manual push type. In real-world applications, since you wash your hands after touching it, hands-free is not necessary. The paper towel dispenser, however, is a different scenario.

DISINFECTANTS

Disinfectants are antimicrobial pesticides and must be registered with the U.S. EPA and the California Department of Pesticide Regulation (DPR) or similar agencies in other states.

Any product that states it can kill a bacteria or virus on a hard surface must be tested and registered with the EPA. The registration number has to appear on the product label. If a product does not have an EPA number it can only clean – not kill.

Conversely, any product related to your body both inside and outside are regulated by the FDA. They have different guidelines than the EPA.

Sanitizing is meant to reduce, not kill, the occurrence and growth of bacteria, viruses and fungi. Disinfecting a surface will "kill" the microscopic organisms as claimed on the label of a product... The minimum level of effectiveness in a modern day disinfectant is 100% kill of 6 log10 of an organism.

Some devices can be used to disinfect; for example machines that apply steam to surfaces. These devices are very effective and use no chemicals. These have a longer warm up time and are designed more for detail work. They can destroy odors in soft fabrics as long as they can take the high heat. They can destroy C-Diff and dust mites.

Newer technologies like UV lights and electrostatic sprayers are rapidly becoming a standard in the healthcare industry. Electrostatic sprayers were the rage during covid, but most of the time improperly used. Chemicals used must be approved to be used in the sprayer and the dwell time must still be adhered to . Too often they are sprayed very quickly and not enough disinfectant applied to kill the bacteria or virus.

UV lights are effective but short distances and only in straight lines that the light beam can touch. The beam is damaging to the naked eye.

Because disinfectants are pesticides designed to kill or inactivate germs, you should make sure you need them for the specific task. The overuse and misuse of these products is a growing public health and environmental concern. Studies have found that the use of some disinfectant products are creating microbes that can mutate into forms that are resistant to particular disinfectants or that become superbugs. These resistant germs are also harder to kill with antibiotics. Incorrectly using a disinfectant may kill the weaker germs, but the more resistant germs survive. Incorrect use includes

- disinfecting a dirty surface;
- wiping or rinsing the disinfectant off the surface before the recommended dwell (contact) time is over;
- not using the recommended dilution ratio (not concentrated enough);
- using a combination disinfectant/cleaner without first removing visible dirt from the surface.

The U.S. EPA regulates sanitizers and disinfectants as pesticides. The U.S. Food and Drug Administration (FDA) regulates sanitizers used on food contact surfaces. Sanitizing and disinfecting require the use of

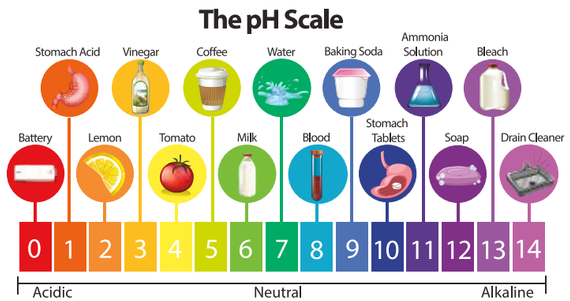
- EPA-registered chemical sanitizers and disinfectants;
- disinfecting/sanitizing water-based devices (for example, those that use steam). A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. We think of pesticides when we think of getting rid of ants or cockroaches, but germs are also pests and the products used to kill them are pesticides.

When deciding on what products to use on a surface, there are several factors to consider: Whether the surface is porous or nonporous.

- Manufacturers design their antimicrobial products – and the U.S. Environmental Protection Agency (EPA) registers them – on the basis of the surfaces they are meant to be used on and what the surfaces are used for (for example, food preparation).
- Different types of surfaces require different types of products and methods for removing or killing germs.
- Whether it is likely that the surface is touched by many people and will come in contact with broken skin or mucous membranes. These surfaces will require disinfection. If a surface is contaminated with germs but no one is touching it, it doesn't need to be disinfected. It is best to avoid unnecessary use of chemicals in that area.

Whether the surface requires:

- sanitizing which removes most germs to the level of 99.9% or more on non-food contact surfaces;



- disinfecting (to kill virtually everything). Remember, some infectious diseases are spread in the air. Disinfecting surfaces will not prevent the spread of these diseases! The only way to prevent the spread of airborne diseases is by our behaviors. See Section 6 on non-chemical strategies for reducing the spread of infectious disease.

What are the recommendations and requirements for sanitizing and disinfecting?

There are typically two levels of sanitizing and disinfecting in an ECE facility:

- Routine sanitizing and disinfecting: This level is used for those areas that need sanitizing and disinfecting on a regular basis (after proper cleaning with a high-quality microfiber cloth and an all-purpose detergent).

Areas requiring routine sanitizing:

- Food contact surfaces (surfaces where food is served, stored, or prepared)

Areas needing routine disinfection:

- Surfaces and items that are regulated by state child care licensing requirements, such as changing tables and bathroom sinks and toilets.
- High-touch areas that are at high risk for collecting lots of germs, like doorknobs, bathroom faucets, and drinking fountains.

CHEMICALLY ACTIVE INGREDIENTS

ALKALINE BUILDERS
Highly Alkaline Detergents (or heavy-duty detergents) use caustic soda (sodium hydroxide) or caustic potash (potassium hydroxide). An important property of these highly alkaline detergents is that they saponify fats: forming soap. These cleaners are used in many CIP systems or bottlewashing applications.

Moderately Alkaline Detergents include sodium, potassium, or ammonium salts of phosphates, silicates, or carbonates. Tri-sodium phosphate (TSP) is one of the oldest and most effective. Silicates are most often used as a corrosion inhibitor. Because of interaction with calcium and magnesium and film formation, carbonate-based detergents are of only limited use in food processing cleaning regimes.

ACID BUILDERS
Acid Detergents include organic and inorganic acids. The most common inorganic acids used include phosphoric, nitric, sulfamic, sodium acid sulfate, and hydrochloric. Organic acids, such as hydroxyacetic, citric, and gluconic, are also in use. Acid detergents are often used in a two-step sequential cleaning regime with alkaline detergents. Acid detergents are also used for the prevention or removal of stone films (mineral stone, beer stone, or milk stone).

WATER CONDITIONERS
Water conditioners are used to prevent the build-up of various mineral deposits (water hardness, etc.). These chemicals are usually sequestering agents or chelating agents. Sequestering agents form soluble complexes with calcium and magnesium. Examples are sodium tripolyphosphate, tetra-potassium pyrophosphate, organo-phosphates, and polyelectrolytes. Chelating agents include sodium gluconate and ethylene diamine tetracetic acid (EDTA).

OXIDIZING AGENTS
Oxidizing agents used in detergent application are hypochlorite (also a sanitizer) and—to a lesser extent—perborate. Chlorinated detergents are most often used to clean protein residues.

ENZYME INGREDIENTS
Enzyme-based detergents, which are amended with enzymes such as amylases and other carbohydrate-degrading enzymes, proteases, and lipases, are finding acceptance in specialized food industry applications.

The primary advantages of enzyme detergents are that they are more environmentally friendly and often require less energy input (less hot water in cleaning). Uses of most enzyme cleaners are usually limited to unheated surfaces (e.g., cold-milk surfaces). However, new generation enzyme cleaners (currently under evaluation) are expected to have broader application.

FILLERS
Fillers add bulk or mass, or dilute dangerous detergent formulations that are difficult to handle. Strong alkalis are often diluted with fillers for ease and safety of handling. Water is used in liquid formulations as a filler. Sodium chloride or sodium sulfate are often fillers in powdered detergent formuations.

MISCELLANEOUS INGREDIENTS
Additional ingredients added to detergents may include corrosion inhibitors, glycol ethers, and butylcellosolve (improve oil, grease, and carbon removal).

SANITIZING

THERMAL SANITIZING As with any heat treatment, the effectiveness of thermal sanitizing is dependant upon a number of factors including initial contamination load, humidity, pH, temperature, and time.

- **Steam** The use of steam as a sanitizing process has limited application. It is generally expensive compared to alternatives, and it is difficult to regulate and monitor contact temperature and time. Further, the byproducts of steam condensation can complicate cleaning operations.
- **Hot Water** Hot-water sanitizing—through immersion (small parts, knives, etc.), spray (dishwashers), or circulating systems—is commonly used. The time required is determined by the temperature of the water. Typical regulatory requirements (Food Code 1995) for use of hot water in dishwashing and utensil sanitizing applications specify immersion for at least 30 sec. at 77°C (170°F) for manual operations; and a final rinse temperature of 74°C (165°F) in single tank, single temperature machines and 82°C (180°F) for other machines.

Many state regulations require a utensil surface temperature of 71°C (160°F), as measured by an irreversibly registering temperature indicator in warewashing machines. Recommendations and requirements for hot-water sanitizing in food processing may vary. The Grade A Pasteurized Milk Ordinance specifies a minimum of 77°C (170°F) for 5 min. Other recommendations for processing operations are 85°C (185°F) for 15 min., or 80°C (176°F) for 20 min.

The primary advantages of hot-water sanitization are relatively inexpensive, easy to apply, and readily available, generally effective over a broad range of microorganisms, relatively non-corrosive, and penetrates into cracks and crevices. Hot-water sanitization is a slow process that requires come-up and cool-down time; can have high energy costs; and has certain safety concerns for employees. The process also has the disadvantages of forming or contributing to film formations and shortening the life of certain equipment or parts thereof (gaskets, etc.).

No available sanitizer meets all of the listed criteria. Therefore, it is important to evaluate the properties, advantages, and disadvantages of available sanitizer for each specific application.

CHEMICAL SANITIZING
The ideal chemical sanitizer should:

- be approved for food contact surface application.
- have a wide range or scope of activity.
- destroy microorganisms rapidly.
- be stable under all types of conditions.
- be tolerant of a broad range of environmental conditions.
- be readily solubilized and possess some detergency.
- be low in toxicity and corrosivity.
- be inexpensive.

REGULATORY CONSIDERATIONS

The regulatory concerns involved with chemical sanitizers are antimicrobial activity or efficacy, safety of residues on food contact surfaces, and environmental safety. It is important to follow regulations that apply for each chemical usage situation. The registration of chemical sanitizers and antimicrobial agents for use on food and food product contact surfaces and on nonproduct contact surfaces is through the U.S. Environmental Protection Agency (EPA). (Prior to approval and registration, the EPA reviews efficacy and safety data, and product labeling information.)

The U.S. Food and Drug Administration (FDA) is primarily involved in evaluating residues from sanitizer use that may enter the food supply. Thus, any antimicrobial agent and its maximum usage level for direct use on food or on food product contact surfaces must be approved by the FDA. Approved no-rinse food contact sanitizers and non-product contact sanitzers, their formulations and usage levels are listed in the Code of Federal Regulations (21 CFR 178.1010). The U.S. Department of Agriculture (USDA) also maintains lists of antimicrobial compounds (i.e., USDA List of Proprietary Substances and Non Food Product Contact Compounds), which are primarily used in the regulation of meats, poultry, and related products by USDA's Food Safety and Inspection Service (FSIS).

FACTORS AFFECTING SANITIZER EFFECTIVENESS

PHYSICAL FACTORS

Surface Characteristics. Prior to the sanitization process, all surfaces must be clean and thoroughly rinsed to remove any detergent residue. An unclean surface cannot be sanitized. Since the effectiveness of sanitization requires direct contact with the microorganisms, the surface should be free of cracks, pits, or crevices which can harbor microorganisms. Surfaces which contain biofilms cannot be effectively sanitized.

- **Exposure Time – Generally, the longer time a sanitizer chemical is in contact with the equipment surface, the more effective the sanitization effect; intimate contact is as important as prolonged contact.**
- **Temperature** – is also positively related to microbial kill by a chemical sanitizer. Avoid high temperatures (above 55°C [131°F]) because of the corrosive nature of most chemical sanitizers.
- **Concentration** – Generally, the activity of a sanitizer increases with increased concentration. However, a leveling off occurs at high concentrations. A common misconception regarding chemicals is that "if a little is good, more is better". Using sanitizer concentrations above recommendations does not sanitize better and, in fact, can be corrosive to equipment and in the long run lead to less cleanability. Follow manufacturer's label instructions.
- **Soil** – The presence of organic matter dramatically reduces the activity of sanitizers and may, in fact, totally inactivate them. The adage is "you cannot sanitize an unclean surface".

CHEMICAL FACTORS

- **pH** – Sanitizers are dramatically affected by the pH of the solution. Many chlorine sanitizers, for example, are almost ineffective at pH values above 7.5.
- **Water properties** – Certain sanitizers are markedly affected by impurities in the water.
- **Inactivators** – Organic and/or inorganic inactivators may react chemically with sanitizers giving rise to nongermicidal products. Some of these inactivators are present in detergent residue. Thus, it is important that surfaces be rinsed prior to sanitization.

BIOLOGICAL FACTORS

The microbiological load can affect sanitizer activity. Also, the type of microorganism present is important. Spores are more resistant than vegetative cells. Certain sanitizers are more active against gram positive than gram negative microorganisms, and vice versa. Sanitizers also vary in their effectiveness against yeasts, molds, fungi, and viruses.

SPECIFIC TYPES OF CHEMICAL SANITIZERS

The chemicals described here are those approved by FDA for use as no-rinse, food-contact surface sanitizers. In food-handling operations, these are used as rinses, sprayed onto surfaces, or circulated through equipment in CIP operations. In certain applications the chemicals are foamed on a surface or fogged into the air to reduce airborne contamination.

CHLORINE-BASED SANITIZERS

Chlorine Compounds. Chlorine, in its various forms, is the most commonly used sanitizer in food processing and handling applications. Commonly used chlorine compounds include liquid chlorine, hypochlorites, inorganic chloramines, and organic chloramines. Chlorine-based sanitizers form hypochlorous acid (HOCl, the most active form) in solution. Available chlorine (the amount of HOCl present) is a function of pH. At pH 5, nearly all is in the form of HOCl. At pH 7.0, approximately 75% is HOCl. HOCl is rapidly becoming a preferred disinfectant. For one, it is not a quat-based disinfectant which as previously mentioned is overused and can create superbugs. Secondly, it can be made on site so there are no shipments of gallons and cardboard and bottles to send to the landfill. One thing covid taught us is the supply chain is not always reliable! Third, they can kill C-diff in stronger solutions better than some of the toxic chemicals that exist now. It is also made up of salt, water and electricity, so it is inexpensive to make after you pay for the initial setup. The maximum allowable level for no-rinse applications is 200ppm available chlorine, but recommended usage levels vary. For hypochlorites, an exposure time of 1 min at a minimum concentration of 50ppm and a temperature of 24°C (75°F) is recommended. For each 10°C (18°F) drop in temperature, a doubling of exposure time is recommended. For chloramines, 200ppm for 1 min is recommended.

Chlorine compounds are broad spectrum germicides that act on microbial membranes, inhibit cellular enzymes involved in glucose metabolism, have a lethal effect on DNA, and oxidize cellular protein. Chlorine has activity at low temperature, is relatively cheap, and leaves minimal residue or film on surfaces.

The activity of chlorine is dramatically affected by such factors as pH, temperature, and organic load. However, chlorine is less affected by water hardness when compared to other sanitizers (especially the quaternary ammonium compounds).

The major disadvantage to chlorine compound is corrosiveness to many metal surfaces (especially at higher temperatures). Health and safety concerns can occur because of skin irritation and mucous membrane damage in confined areas. At low pH (below 4.0), deadly Cl2 (mustard gas) can form. In recent years, concerns have also been raised about the use of chlorine as a drinking water disinfectant and as an antimicrobial with direct food contact (meat, poultry and shellfish). This concern is based upon the involvement of chlorine in the formation of potentially carcinogenic trihalomethanes (THMs) under appropriate conditions. While chlorine's benefits as a sanitizer far outweigh these risks, it is under scrutiny.

CHLORINE DIOXIDE

Chlorine dioxide (ClO2) is currently being considered as a replacement for chlorine, since it appears to be more environmentally friendly. Stabilized ClO2 has FDA approval for most applications in sanitizing equipment or for use as a foam for environmental and nonfood contact surfaces. Approval has also been granted for use in flume waters in fruits and vegetable operations and in poultry process waters. ClO2 has 2.5 times the oxidizing power of chlorine and, thus, less chemical is required. Typical use concentrations range from 1 to 10ppm.

CLO2's primary disadvantages are worker safety and toxicity. Its highly concentrated gases can be explosive and exposure risks to workers are higher than that for chlorine. Its rapid decomposition in the presence of light or at temperatures greater than 50°C (122°F) makes on-site generation a recommended practice.

AQUEOUS OZONE

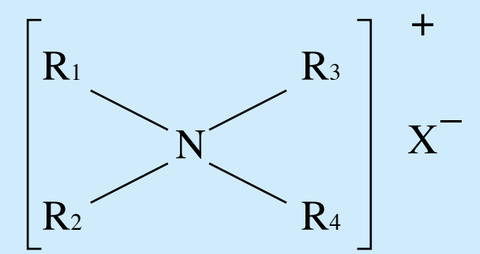
A rising star in the cleaning industry is the use of aqueous ozone. This is made on-site so there is no storage of chemicals, no shipments of chemicals so the carbon footprint reduction is a tremendous advantage. Aqueous ozone is a cleaner sanitizer but not a disinfectant according to EPA. It is made by adding a 3rd oxygen molecule to water by way of electricity. This can last a few hours and works great on organic soil loads. It is generally neutral Ph unless something else is added. These work great on sanitizing food as well as general surface cleaning.

IODINE

Use of iodine as an antimicrobial agents dates back to the 1800s. This sanitizer exists in many forms and usually exists with a surfactant as a carrier. These mixtures are termed iodophors. The most active agent is the dissociated free iodine (also less stable). This form is most prevalent at low pH. The amount of dissociation from the surfactant is dependent upon the type of surfactant. Iodine solubility is very limited in water. Generally recommended usage for iodophors is 12.5 to 25ppm for 1 min.

QUATERNARY AMMONIUM COMPOUNDS (QUATS)

Quaternary ammonium compounds (Quats) are a class of compounds that have the general structure as follows (Figure 1):



QUATS

Quats currently are the industry standard for disinfecting they come in RTU and concentrates with varying dilution ratios. Each one has specific kill claims and dwell times. It is very important to research your specific needs and select accordingly.

The properties of these compounds depend upon the covalently bound alkyl groups (R groups), which can be highly diverse. Since QACs are positively charged cations, their mode of action is related to their attraction to negatively charged materials such as bacterial proteins. It is generally accepted that the mode of action is at the membrane function. The carbon length of R-group side chain is, generally, directly related with sanitizer activity in QACs. However, because of the lower solubility in QACs composed of large carbon chains, these sanitizers may have lower activity than short chain structures.

QACs are active and stable over a broad temperature range. Because they are surfactants, they possess some detergency. Thus, they are less affected by light soil than are other sanitizers. However, heavy soil dramatically decreases activity. QACs generally have higher activity at alkaline pH.

While lack of tolerance to hard water is often listed as a major disadvantage of QACs when compared to chlorine, some QACs are fairly tolerant of hard water. Activity can be improved by the use of EDTA as a chelator. QACs are effective against bacteria, yeasts, mold, and viruses.

One disadvantage of QACs is film residue, especially when over-applied. This can cause sticky floors or counter tops.

QACs are generally more active against gram positive than gram negative bacteria. They are not highly effective against bacteriophages. Their incompatibility with certain detergents makes thorough rinsing following cleaning operations imperative. Further, many QAC formulations can cause foaming problems in CIP applications.

Under recommended usage and precautions, QACs pose little toxicity or safety risks. Thus, they are in common use as environmental fogs and as room deodorizers. However, care should be exercised in handling concentrated solutions or use as environmental fogging agents.

ACID-ANIONIC SANITIZERS
Like QACs, acid-anionic sanitizers are surface-active sanitizers. These formulations include an inorganic acid plus a surfactant and are often used for the dual function of acid rinse and sanitization.

Whereas QACs are positively charged, these sanitizers are negatively charged. Their activity is moderately affected by water hardness. Their low use pH, detergency, stability, low odor potential, and non-corrosiveness make them highly desirable in some applications.

Disadvantages include relatively high cost, a closely defined pH range of activity (pH 2 to 3), low activity on molds and yeasts, excessive foaming in CIP systems, and incompatibility with cationic surfactant detergents.

FATTY ACID SANITIZERS
Fatty acid or carboxylic acid sanitizers were developed in the 1980s. Typical formulations include fatty acids plus other acids (phosphoric acids, organic acids). These agents also have the dual function of acid rinse and sanitization. The major advantage over acid anionics is lower foaming potential.

These sanitizers have a broad range of activity, are highly stable in dilute form, are stable to organic matter, and are stable to high temperature applications. These sanitizers have low activity above pH 3.5–4.0, are not very effective against yeasts and molds, and some formulations lose activity at temperatures below 10°C (50°F). They also can be corrosive to soft metals and can degrade certain plastics and rubber.

PEROXIDES
Peroxides or peroxy compounds contain at least one pair of covalently bonded oxygen atoms (-O-O-) and are divided into two groups: the inorganic group, containing hydrogen peroxide (HP) and related compounds; and the organic group, containing peroxyacetic acid (PAA) and related compounds.

Peroxides are popular in the commercial cleaning industry. They may also have additives to make them disinfectants. These are most effective on organic compounds such as blood, wine, body fluids, food, coffee, etc. Once used the extra oxygen molecule is released and it reverts back to oxygen and water.

Hydrogen peroxide (HP), while widely used in the medical field, has found only limited application in the food industry. FDA approval has been granted for HP use for sterilizing equipment and packages in aseptic operations.

The primary mode of action for HP is through creating an oxidizing environment and generation of singlet or superoxide oxygen (SO). HP is fairly broad spectrum with slightly higher activity against gram-negative than grampositive organisms.

High concentrations of HP (5% and above) can be an eye and skin irritant. Thus, high concentrations should be handled with care.

Peroxyacetic Acid (PAA) has been known for its germicidal properties for a long time. However, it has only found food-industry application in recent years and is being promoted as a potential chlorine replacement. PAA is relatively stable at use strengths of 100 to 200ppm. Other desirable properties include absence of foam and phosphates, low corrosiveness, tolerance to hard water, and favorable biodegradability. PAA solutions have been shown to be useful in removing biofilms.

While precise mode of action mechanisms have not been determined, it is generally theorized that the PAA reaction with microorganisms is similar to that of HP. PAA, however, is highly active against both gram-positive and gram-negative microorganisms. The germicidal activity of PAA is dramatically affected by pH. Any pH increase above 7–8 drastically reduces the activity.

PAA has a pungent odor and the concentrated product (40%) is a highly toxic, potent irritant, and powerful oxidizer. Thus, care must be used in its use.

BLEACH

Sodium hypochlorite is the active ingredient in household bleach. When concentrated bleach solutions are mixed with items like ammonia or acidic cleaners, a toxic gas can be formed. If bleach sanitizer is accidentally mixed with an acid cleaner it can be deadly.

A list of things of common items that should not be mixed with bleach:

- Household ammonia
- Toilet Bowl Cleaners
- Soap Scum Cleaners
- Vinegar
- Lime Scale Removers
- Rust Removers
- Oxidizers

Bleach is not needed in commercial cleaning operations and there are alternatives that can work as well, in some cases better, and without the potential incompatibility issues of bleach.

THE PROBLEM WITH BLEACH

Do you encounter people that think bleach is a good cleaner and disinfectant? Below are some misconceptions that users have about bleach and responses that sales professionals can use to educate their customers on better and safer cleaning and disinfecting.

BLEACH KILLS GERMS
Bleach kills germs only if the surface is pre-cleaned first. Bleach is rapidly inactivated by organic soil. If germs are present, organic soil is also present, even if not visible. If you're not pre-cleaning, you may not be killing germs.

EPA registered "quat" disinfectants are not as easily affected by organic soils.

BLEACH IS CHEAP
Bleach only looks cheap. To kill germs you must first pre-clean the surface. Now, every cleaning operation is a two step process, increasing the time it takes to effectively clean. Bleach purchased at a retail shore costs about $2 per gallon. Bleach, diluted at the recommended 1:10 makes an RTU cost of 18 cents per gallon.

A properly diluted quat disinfectant has an estimated RTU cost of 20-30 cents per diluted gallon. This is comparable to diluted bleach. The cost of property damage and/or employee work safety is far more costly than using a better disinfectant than bleach. The best practice is to leave bleach for laundry and not use it anywhere else.

DEFINITIONS

ORGANIC SOILS
This refers to anything from food residue, skin oils, to blood and other bodily fluids. Basically one assumes anything that has had human contact has organic soil present.

BLEACH
The generic name commonly used for a water solution of a chemical called sodium hypochlorite. Normal household bleach contains 5.5% sodium hypochlorite.

QUAT
Short name for 'Quaternary Ammonium Chloride' a group of compounds shown to be effective germicidal agents.

BLEACH CLEANS
Bleach really does not clean. It does oxidize some soils, but it does not effectively remove soils like a cleaner. Plus, using bleach may be more potentially toxic for people and the environment when used in place of a regular cleaner.

As a society, we overuse disinfectants thinking that we have to effectively kill every bacteria on every surface. Remember, most bacteria are good bacteria that are essential for life. Disinfectants are germicides that should be used only where needed. Surfaces that should be disinfected regularly are defined as HIGH TOUCH Surfaces. Regular cleaning of many common surfaces using a green certified cleaner is a more effective and an environmentally safer approach. Remember, think before you disinfect!

BLEACH IS SAFE
Bleach is hardly safe. It is toxic, reactive, and can destroy surfaces. We all know what bleach can do to fabrics. Those bleach fumes are basically chlorine gas. Mix bleach with such things as ammonia, vinegar, or acidic toilet bowl cleaner to make a toxic gas that can be fatal.

Unfortunately, we hear too often about buildings being evacuated because toxic fumes spread from mixing bleach with another chemical. The results can even be deadly! Bleach can literally burn your skins and lungs and cause severe eye damage or blindness.

Quat based disinfectants are safe for use on hard non-porous surfaces. The quat compound does not release fumes, so often the only smell is a light fragrance. They are non-reactive with other common cleaning chemical compounds, making them safer to use. Alternate disinfecting methods rather than bleach will ensure safety for all building occupants and staff as well as the property itself.

ENGINEERED WATER

A new emerging category in the chemistry cleaning world is something known as "engineered water". This means water is altered or engineered to clean without any chemicals or at the least very little. Between small doses of chemicals and less plastic and cardboard going to the landfill this process is very beneficial to the planet. When dry they leave little to no residue, bacteria growth and odors are eliminated.

ADVANTAGES OF ENGINEERED WATER

- Efficiency
- On-site demand – no shipping, storage, or transporting cases of product.
- Replaces most everyday chemicals
- Control your inventory – no waiting on suppliers as you make it on-site
- Non-toxic, Non-residue film – non-asthmatic
- Reverts back to water and oxygen
- Cost savings – save budget dollars, labor costs and the environment
- Sustainability – reduce waste with cardboard and bottles not going to landfill

Engineered water can be broken down into 3 different methods:

- **HOT STEAM VAPOR** – Utilizes specialized machines that heat water to 250 degrees or more. This sterilizes most surfaces but is a slower operational process and better left for detail work.
- **ELECTROLYZED WATER** – This process creates two products: sodium hydroxide and hypochlorous acid. The sodium hydroxide is a carpet cleaner slash degreaser. The hypochlorous acid is a disinfectant. It can be diluted to different strengths to kill most viruses and bacteria. It is safer than quats. Hypochlorous acid is known as HOCl.
- **AQUEOUS WATER** – Ozone is infused into the water. Ozone is stronger than chlorine and is a good cleaner and a powerful deodorizer. Some companies require no additives, as a result it is the fastest and easiest method to clean. Aqueous ozone is not very stable and only lasts 2 to 4 hours however if stabilized it becomes "SAO" stabilized aqueous ozone. Then it can last 24 hours to a week depending on how it is being used. Aqueous ozone can be manufactured on demand, so storage is not necessary and is now being incorporated into motorized cleaning equipment.

SAO, which stands for "Stabilized Aqueous Ozone", is a highly effective natural cleaner, sanitizer, and deodorizer, produced with only two ingredients: water and oxygen. Stabilized Aqueous Ozone (SAO) is made similarly to hydrogen peroxide (H2O2) in that both compounds require the introduction of one extra oxygen (O) atom. However, SAO differs from hydrogen peroxide in terms of toxicity, as it requires only water (H2O) and oxygen (O2) to produce. As a result, SAO is 100% free of toxins, VOCs and QACs. After SAO finishes interacting with the dirt and germs on your surfaces, it reverts safely back into oxygen and water and does not negatively impact your health or the environment.

Stabilized Aqueous Ozone (SAO) has proven to be an effective and sustainable cleaning, sanitizing, and deodorizing solution on an evolutionary path for decades. Whether you want to advance your business's sustainability initiatives or keep your family and loved ones safe from toxic chemical exposure Stabilized Aqueous Ozone (SAO) is definitely a viable alternative to using harmful chemicals to sanitize.

HOW SAO WORKS

This patent-protected technology creates Stabilized Aqueous Ozone (SAO), an effective, innovative and sustainable cleaning, deodorizing, and sanitizing solution. SAO attacks organic matter, breaking it down into smaller particles and suspending it in solution.[1]

HOW SAO CLEANS

Ozone reacts with proteins which are large organic compounds and consist of strings of amino acids held together by peptide bonds. Peptide bonds react with the 3rd oxygen atom in ozone and break apart the proteins, leaving behind those amino acids. The base amino acids will continue to react with ozone and break down into even more stable/inert inactive matter. These minute particles are then readily suspended in solution. Once dirt is surrounded by these ions, it no longer adheres to the surface and becomes suspended in solution.

HOW SAO KILLS

When applied to surfaces, SAO (ozone in a stabilized, aqueous form), kills the germs that can also cause odors. When ozone (0_3) molecules make contact with the cell wall of bacteria & viruses, tiny holes are created. This reaction is called oxidation. Oxidation is germ killing.

EFFICIENCY

Eliminates the need to purchase, transport, distribute, store and restock inventory of multiple cleaning and sanitizing products.

HEALTH & SAFETY

IMPROVED HEALTH & SAFETY – non-toxic solution reduces exposure to harsh chemicals for cleaning staff, clients & Visitors.

- Does not leave fumes or residues drastically reducing slip and falls, as slip co-efficient testing exceed industry standards.
- Safe for human contact, yet exceeds Green Seal Standards (GS-37 and GS-53) as industrial cleaner.
- Protects people with allergies or sensitivities as SDS is 0-0-0-A.
- Simplified and standardized safety training.

COST SAVINGS

Global clients report cost savings in:

- Labor
- Water
- Natural Resources
- Time
- Equipment
- Productivity
- Expenditures

SUSTAINABILITY

BENEFIT OF SWITCHING FROM CHEMICALS TO SAO – By using on-site generation, your carbon footprint is dramatically reduced. Less packaging and emissions translates to less in our landfills and to the planet.

- As of March 2021, SAO is currently eliminating over 672,453,000 liters or 4,229,264 barrels of chemicals from going down the drain or into a landfill each year
- SAO reverts back to water and oxygen, and can be disposed down the drain without negatively impacting our waterways.

1 SOURCE Tersano, Inc. (n.d.). Tersano, Inc. https://tersano.com/

FLOOR FINISHES

Floor finishes have seen dramatic changes in the last decade. Originally finishes were just designed to protect the floor substrate. They were not very glossy or hard and required a floor sealer. Today they are designed to add beauty, depth of gloss and protection at the same time and most of the time, no additional products are required.

Finishes are made using acrylic or urethane or sometime a blend of both polymers. Acrylic finishes are the least expensive of the 2 types. Today most finishes are considered water born and not solvent based. This allows for easier cleanups and less VOC's in the building.

One common myth concerns the number of solids a floor finish has. There is confusion as some manufacturer's label their solids as to the total inside the container, while others label what is left after drying on the floor. What is left on the floor is known as true solids. The rule of thumb is you need at least 100% floor protection. Anything above that is for personal aesthetic reasons or really heavy traffic use. So, let's do the math, if you have a 20% solid and you strip the floor to its original base, the requirement is 5 coats are needed to obtain the 100% level. The more coats needed plus counting the dry time between the finishes, the more labor costs are involved to get the job done. This is the sole basis of what solids mean. In other words, a 25% solid would mean 4 coats and allow for labor savings. Some salespeople try to upsell you from a 20 to 25 % solid saying it is a better finish. Solids have little to nothing to do with the quality or glossiness of the finish. Let me repeat that…. solids have little to nothing to do with quality or glossiness of the finish. It will save you labor dollars unless the dry times are faster with the 20 % finish. The quality of the ingredients, the specials blends and patented products create the glossiness and the hardness of the finish, not the number of solids.

The most recent development in finishes are nanotechnology. This allows for a tighter bond at the molecular level making a harder finish and better bonding to the floor. It generally means the dry times are faster between coasts typically 12- 15 minutes versus 25-40 minutes for older finishes.

Rain, humidity and airflow can substantially affect the dry times too.

Another new development is "Green" finishes. This means they are zinc free. Zinc is a heavy metal that contaminates the wastewater stream. It was used to make the finish more durable. The newest nanotechnology has transformed the green finish into serious competitors to the standard floor finishes of yesterday.

CHEMICAL FLOOR STRIPPERS

Traditional floor strippers dilute at a 1:4 ratio and are very toxic. They use solvents that are harmful to organs, reproductive tracts and skin, lungs and eyes. There are some super concentrated versions packed in quarts. The better ones can strip up to 6 or 7 layers of finishes at a time.

Green strippers have been formulated to deal with those health and environmental concerns of the traditional stripper. Green strippers use safer solvents, such as benzyl alcohol. This is non-toxic and far safer to use. They are not corrosive and do not have to ship with the cautionary label and freight rates as the conventional stripper. Some original green strippers would only work on green finishes. With the newer technology they can be just as effective on both traditional floor finishes and green floor finishes.

FLOORING MATERIALS

Floors are the first thing people notice when they enter your facility. They are also a major investment in both time and money.

Maintaining the appearance of your hard floors requires daily cleaning and maintenance to remove soil that is tracked into your facility, it will decrease damage to your floors, and reduce the frequency of periodic or restorative hard floor care procedures that are more time-consuming and expensive.

90% of the soil in a building is tracked in from the outside. Without daily cleaning and maintenance procedures, floors can easily become damaged by abrasive soils and debris. Soils, like sand, cut and scratch hard floors, wearing down the floor finish and creating a dull appearance. Entrance mats discussed in another section and daily maintenance can slow this process down

Flooring can generally be categorized into these areas:

- Vinyl Composition Tile (VCT)
- Vinyl Asbestos Tile or Asphalt Tile (VAT)
- Luxury Vinyl Tile (LVT)
- Linoleum
- Rubber (mondo floors)
- Wood
- Concrete raw, polished, or stained
- Terrazzo
- Soft Surface (Carpet)

Not all floor types are tolerant to the same cleaning chemicals or procedures, always check the Manufacturer's Guidelines for the proper chemical, and procedure recommendations. Our trained staff of Industry Professionals can help guide you through the selection process and best practices for each procedure.

CARPETS

Don't take shortcuts in cleaning all aspects of a building and carpets are particularly important! A majority of Americans (93%) would form a negative perception of a company or organization if its facility had dirty carpet, according to a new survey from Whittaker Co.

"Whether it's a retail store, hotel, school, long-term care facility, or another type of building, customers, prospective employees, students, and residents are observant of the way facilities maintain their interiors," said Joe Bshero, director of technical services at Whittaker. "This research demonstrates just how important it is for facilities to ensure a good first impression by properly maintaining carpet."

The survey looked at the type of facilities most impacted by carpet neglect. It found:

- 80% of Americans would form a negative perception of a hotel with dirty carpet
- 72% would think adversely about a long-term care facility with dirty carpet
- 70% would think less of an apartment/condo common area with dirty carpet
- 66% would question the cleanliness of retail stores with dirty carpet
- 64% would think negatively about office buildings with unkempt carpet.

When encountering dirty carpet in a public facility:

- 58% of surveyed Americans would assume the facility is not clean
- 50% would spend less time in the building
- 47% would tell friends or family about the lack of cleanliness in the facility.

Carpets can be made from all kinds of fabrics, including polypropylene, polyester, acrylic, silk, wool and nylon. But because of its powerful resilience and resistance to abrasion and mildew, nylon makes up half of the carpeting sold in the U.S.[1]

Besides the material used there are different methods of manufacturing a carpet; see chart below.

The methods used vary depending upon type of facility, amount of traffic and budget.

Manufacturers also use different kinds of protective, strain-resistant coatings. Each company uses its own proprietary chemical treatments and application techniques. It is important to know the type of carpet before starting any cleaning or spotting process. Wool and silk require special chemicals and low moisture methods for cleaning.

1 SOURCE: Bane-Clene Systems

	WOOL CARPETS This is a natural, luxurious, long lasting material that is one of the softest carpet fibers you can find. Unfortuantely, low grade wool is more susceptible to staining, while high grade wool is extremely
	NYLON CARPETS Very soft, durable, and resistant to stains, mylon is the most popular carpet material and is used in roughly three-quarters of all manufactured pieces.
	POLYPROPYLEME CARPETS Almost as soft as nylon, these fibers are extremely resilient and resistant to stains, mildew and shredding.
	POLYESTER CARPETS They do not fade much over time. They are non-allergenic, and in many cases this material is crafter from recycled plastic bottles making it eco-friendly.

THE MAJOR WAYS TO CLEAN CARPET

1. **Hot water extraction or steam cleaning.** The deepest clean available, that reaches deep into the carpet fibers. It also has the longest dry times. All other methods require a hot water extraction as the restorative method for deep cleaning
2. **Dry absorbent compounds** These are sprinkled on and specialized equipment is used to massage into the fibers. This method featured quick dry times but only cleans the top 1/3 of the fiber.
3. **Dry foam** is shampooed into the carpet and allowed to dry and then vacuum up the dirt. It also dries fast and cleans the surface of the fibers.
4. **Bonneting** is for interim maintenance. You can prespray the traffic areas and use a rotary machine with a carpet bonnet pad to clean the surface of the carpet. This is a fast method to keep a facility looking good. Too much use though, can leave a lot of residue in the carpet or prematurely wear down the carpet.
5. **Encapsulation** is newer chemical technology that can be applied various ways and allowed to dry. The chemistry behind this allows the dirt to be surrounded (encapsulated) and made into larger molecules for the vacuum to easily extract. Each time you vacuum more dirt is removed from the carpet. This allows the facility to do less hot water extraction, saving labor dollars.

When spot cleaning the use of Litmus paper, pH paper or electronic pH meters can determine the pH of a stain on a carpet and aid in determining the proper cleaning solution.

Interpret the results. If the resulting color corresponds to a number between 0 and 6, then your carpet cleaner is acidic. If the results fall between 9 and 14, then your carpet cleaner is alkaline. A pH between 6 and 7 indicates a carpet cleaner with a neutral pH.

FLOOR PADS

Using a reliable floor scrubbing machine can be a critical part of cleaning a dirty lobby floor. However, what most people don't realize is that the real work is being done by the floor pad. Choosing a floor pad that's too soft will have little effect on a dirty floor and will waste both time and money, while choosing a pad that's woven with an aggressive pattern can cause damage to a floor. The machines used are either a 175rpm machine or an autoscrubber for cleaning and a higher speed machine for polishing or buffing. They may require one or 2 pads depending upon the cleaning head and available in sizes from 8 inch to 27 inches. There are a variety of floor pads that can be used to either strip, burnish, polish or buff a floor. Before you select a floor pad you need to understand the floor type, the job goal and will the pad fit my machine? Floor pads can carry a green seal certification and are made from recycled plastic bottles.

FLOOR PAD COLORS - Floor pads for the 175 rpm machines have an industry standard color-coding system to help you understand how aggressive a specific pad will be on your floor. Lighter color pads are considered light-duty or everyday use, while darker colored pads are typically more aggressive for less frequent use. However, things are not always standard when you move into the Floor burnishing pads. It is very important to have a basic understanding of the colors as well as the types of pads. Low speed pads are 1,000 RPM and lower and high speed pads are anything above the 1,000 RPM range. High-speed pads may be used on low pad machines, but not vice versa.

POLISHING PADS are the softest floor pad and are great for daily tasks. This is also a great practice pad for beginners since it will not leave marks on the finish.

Use white polishing pads with a low speed floor polisher and a spray chemical designed for finishes or a water mist to add a gloss to your floors. White pads are not durable enough for textured surfaces and are not designed for high speed machines.

- **Floor Types:** VCT, VAT, Sheet Vinyl, Terrazzo, Granite and Concrete Surfaces
- **Tolerance:** 350 – 800 RPM
- **Frequency:** 1-5 times per week

BUFFING PADS remove light scuff marks and dirt while producing a shine. These are typically tan or red pads and perfect for light-duty use as they will not damage most floors. They are suitable for most daily cleaning tasks and are designed for a low speed buffing machine.

- **Floor Types:** VCT, VAT, Sheet Vinyl, Terrazzo, Granite and Concrete Surfaces
- **Tolerance:** 350 – 800 RPM
- **Frequency:** 1-5 times per week

BURNISHING PADS are designed for use at ultra-high speeds after the floor has been cleaned, to bring out a glossy shine. Burnishing pads do not follow the traditional color-coding system, so it is best to read the product description in detail to understand the pad's usage. Common colors are pink, beige, peach, green, blue and hog's hair. Hog hair is the most aggressive and usually come in several blends for today's floor finishes.

- **Floor Types:** VCT, VAT, Sheet Vinyl, Terrazzo, Granite and Concrete Surfaces
- **Tolerance:** Up to 3000 RPM
- **Frequency:** Varies

CONDITIONING AND SURFACE PREPARATION PADS are known as strip free pads. Also called SPP pads. They are used on both wood floors or for removing layers of finish from VCT floors. They remove 2-3 micro layers of finish to prepare the surface for recoating. Surface preparation pads are a maroon color and are considered aggressive.

- **Floor Types:** Wood and VCT Surfaces
- **Tolerance:** 175 – 300 RPM
- **Frequency:** as needed for recoating

SPECIALTY PADS are a new type of pad that does dual duty. They clean and polish at the same time. These are used with water on both auto scrubbers and 175rpm machines.

- **Floor Types:** Any floor finish
- **Tolerance:** 175 – 350 RPM
- **Frequency:** daily

SCRUBBING PADS or cleaning pads are designed to be aggressive without removing the finish of a floor. Use scrubbing pads to remove heavy dirt and scuff marks with a low speed machine. These are best used for heavy traffic areas and walkways and are intended for wet scrubbing.

Because of scrubbing pads' aggressive nature, they can be used for light stripping of old, soiled finishes. **Dark green scrubbing pads** are considered to be the most aggressive.

- **Floor Types:** VCT, VAT, Sheet Vinyl, Terrazzo, Granite and Concrete Surfaces
- **Tolerance:** 175-350 RPM
- **Frequency:** Quarterly

STRIPPING PADS completely remove finish, sealer, waxes and dirt so you can refinish your floor. They are very aggressive and abrasive and should be used with low speed machines. Black is the standard color for stripping pads, but other common colors are green, deep blue and brown. Depending on how many layers of finish involved and whether it was routinely burnished, you can choose the right color stripping pad for the job.

- **Floor Types:** VCT, VAT, Sheet Vinyl, Terrazzo, Granite and Concrete Surfaces
- **Tolerance:** 175-350 RPM
- **Frequency:** 18-36 months

DIAMOND IMPREGNATED PADS are designed for concrete floors both stained and natural. They range in aggressiveness by grit running from 200 to 11,000 grit. The higher the grit the smoother and shiny the floor will be. The floor must always be clean even between the grits used. They can be used with both water and specialty chemicals to achieve the desired outcome.

CARPET CLEANING PADS are also known as bonnet pads. These are used for maintenance cleaning after vacuuming. Use with a mist of chemical cleaner or shampoo to loosen any dirt. This is a quick interim method for high use areas.

- **Floor Types:** Looped Carpets
- **Tolerance:** 175 - 300 RPM
- • Frequency: Once a week

Choosing the right floor pad for the job at hand does require some research. By understanding the floor pad types and color-coding system, you are on the right pad to a job well done.

CERTIFIED GREEN CLEANING

Green cleaning can have a lot of definitions, but the main goal of green cleaning is to use cleaning solutions and methods that are sustainable for our environments and that also keep us healthy. Green cleaning can fall under the umbrella of using a green cleaning product or cleaning your facility in a way that, for example, reduces waste. Green cleaning also refers to using cleaning methods and products with environmentally friendly ingredients and procedures which are designed to preserve human health and environmental quality. Green cleaning techniques and products avoid the use of products which contain toxic chemicals, some of which emit volatile organic compounds causing respiratory, dermatological and other conditions. Green cleaning can also describe the way residential and industrial cleaning products are manufactured, packaged and distributed. If the manufacturing process is environmentally friendly and the products are biodegradable, then the term “green” or “eco-friendly” may apply.

Most green cleaners are made from renewable resources, not petroleum. Some have a high bio-based content of 70% or more. The base can include soy, corn and potato ingredients. When purchasing products, be careful about claims of ‘eco-products’. There is a lot of green washing in the industry. Just because a label or product has ‘green’ in it, or is colored green, does not make it a ‘green’ chemical. The best way to avoid mistakes is to use 3rd party certified products, and/or inspect the SDS sheet and view the cautionary symbols and statements.

When you use a green cleaning product, you want to avoid phosphates, chlorine, artificial fragrances, triclosan, ammonia, butyl, corrosives, sara 313 chemicals and artificial colors. Many cleaners on the market now are also marketed as being biodegradable. Other cleaners have ingredients that are grown organically or produced using sustainable farming practices. Some green cleaning products may certify that their items are fair trade, meaning that the product meets certain environmental and labor standards by those who produced it. Green cleaning products may not be free of additives or harmful chemicals—perhaps they use recycled packaging or donate a portion of their profits to environmental causes. Those are all examples of green cleaning products.

In recent years, there has been quite a bit of debate about whether or not green cleaning products are as effective as traditional cleaners. When it comes to killing germs and stopping the spread of infection, for example, it is vital to have an effective product. The two major causes of absenteeism are asthma and acute illness. When employing green cleaning methods like high filter vacuums and the use of green chemicals, along with disinfectants, the rate can be significantly reduced. Green cleaning items have also faced a backlash because they can cost more than traditional cleaning products.

Whatever choices you make about your cleaning supplies and practices, there is a huge variety of environmentally friendly choices for those interested in green cleaning. With a little research, you may be able to green up your cleaning routine to create a healthier, safer environment for yourself and others.

Being green certified isn’t as difficult as it may sound. In most cases, you’ll need to implement green cleaning practices and then have a third party evaluate those practices to determine if you are using environmentally sound practices. This can help expand your customer base substantially because the businesses that you clean are growing more interested in green cleaning practices. It’s better for the health of their employees, as well as the health of the earth.

With so much emphasis on the environment and personal health, going green can also help you to win job bids more easily. Show your credentials when you bid on a job, and businesses will appreciate that you’ve taken the time and effort to create a sustainable, affordable strategy that helps protect people and the world around them. In fact, some bids require that you become green certified. Government agencies, for example, expect their third-party cleaners to be green certified. Some private businesses will also only hire eco-friendly cleaning businesses because it’s better for their employees and may cut down on insurance costs.

Customers aren’t the only people who benefit from green cleaning services. Sustainable practices may also help cut down on the number of employee illnesses that may result from harsh cleaning chemicals, which means fewer sick days and more engaged workers. Not only that, but your workers will appreciate you more because you’re demonstrating a concern for their health and well-being. This is the same reason that customers appreciate a green company. It gives people some comfort to know that the residue from cleaning chemicals isn’t going to be left behind on their job sites. And if you have one happy customer, you’re likely to have more, especially since happy customers are more likely to give referrals that will turn into new business for you.

Most organizations that will certify your company as green have a few requirements. The first is that you use green cleaning products and practices. To become certified, your business has to be almost exclusively green, depending on the agency you use for certification. Once you’ve taken steps to become green, there’s usually an application to fill out, and possibly a fee. Then, the agency you’re working with will audit your business to make sure that you’re using the

green cleaning practices you claim to. If any of your products or services are deemed not eco-friendly, the agency will help you to adjust your offering so that it does fall in the green category. You may also be required to renew your certification yearly to make sure that you are still up to date with the latest in green cleaning technology and products.

Among the product-labeling programs is the United States Environmental Protection Agency's (EPA) Design for the Environment program which labels products that meet EPA's criteria for chemicals. These products are allowed to carry the Design for the Environment (DfE) label, renamed EPA Safer Choice in 2015. Generally, products which are labelled 'low' or 'zero' VOC are safer for human and animal health in the home as well as the environment. In addition, EPA's Toxic Substances Control Act addresses chemicals in the environment and makes regulatory rules to maximize human health.

Leadership in Energy and Environmental Design (LEED) is a green building certification program used worldwide. Developed by the non-profit U.S. Green Building Council (USGBC) it includes a set of rating systems for the design, construction, operation, and maintenance of green buildings, homes, and neighborhoods that aims to help building owners and operators be environmentally responsible and use resources efficiently. The U.S. Green Building Council (USGBC) is a private 501(c)3, membership-based non-profit organization that promotes sustainability in building design, construction, and operation. USGBC is best known for its development of the Leadership in Energy and Environmental Design (LEED) green building rating systems. Through its partnership with the Green Business Certification Inc. (GBCI), USGBC offers a suite of LEED professional credentials that denote expertise in the field of green building. USGBC incentivizes LEED certification by awarding extra certification points to building projects completed with a LEED-certified professional on staff.

Green cleaning has a lot of different definitions and can include a lot of different subjects but in general it's a movement right now in the Jan/San industry to use bio-safe chemicals and other cleaning products that are safer for our environment and also using products that are made from recycled materials for a Greener and more sustainable future.[1]

Using the least hazardous and most effective products available will protect the health of the children in your care, staff, the custodial personnel, and other building occupants. Using these products is also better for the environment.

1 SOURCES: Wikipedia, Spruce.com, Green Seal

CLEANING PRODUCT RIGHT TO KNOW ACT

On October 15, 2017, California Governor Jerry Brown signed into law Senate Bill 258, the Cleaning Product Right to Know Act.

The Cleaning Product Right to Know Act makes California the first state to require ingredient labeling both on product labels and online for cleaning products. Unlike retail packaged food, no federal requirements exist for disclosing ingredients on cleaning products. The Cleaning Product Right to Know Act will require known hazardous chemicals in cleaning products to be listed on both product labels and online by 2020. The legislation lists 34 chemicals found in cleaning products that have been shown to cause cancer, birth defects, asthma and other serious health effects:

1,4-Dioxane	Nitrilotriacetic acid	Butylparaben	Imidazolidinyl urea
1,1-Dichloroethane	Butyl benzyl phthalate	Ethylparaben	Polyoxymethylene urea
Acrylic acid	Butyl decyl phthalate	Isobutylparaben	Sodium hydroxymethylglycinate
Benzene	Di(2-ethylhexyl) phthalate	Methylparaben	2-Bromo-2-nitropropane-1,3-diol
Benzidine	Diethyl phthalate	Propylparaben	N-Nitrosodimethylamine
1,3-Butadiene	Diisobutyl phthalate	Formaldehyde	N-Nitrosodiethylamine
Carbon tetrachloride	Di(n-octyl) phthalate	DMDM hydantoin	1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride
Chloroform	Diisononyl phthalate	Diazolidinyl urea	
Ethylene oxide	Dioctyl phthalate	Glyoxal	

In the announcement made by the California State Senate said the bill was in "response to consumers' demand for transparency."

Third-party certifiers: A way to identify safer cleaning products Organizations that evaluate products using science-based criteria for health and environmental impacts are called third-party certifiers. They help us identify less hazardous cleaning products and publish lists of the products they have evaluated and certified. They have developed standards that they use to review products. These standards prohibit or limit chemicals that can cause the following:

- cancer and reproductive harm
- asthma
- corrosive damage to the skin and eyes
- toxicity to fish and other aquatic animals
- indoor air pollution and other environmental and health problems

The logo or seal for third-party certified products is on the product container. If a product does not carry a third-party certification logo, look for the following:

- Ingredients listed on the label
- No signal word "Danger" on the label. "Signal words" on the label are used to indicate the product's relative level of severity of hazard and alert the reader to a potential hazard.
- Non-aerosol
- No overwhelming chemical odor
- Fragrance-free
- Dye-free

THE 4 MAIN CERTIFICATION AGENCIES

ECOLOGO

Ecologo is part of the Underwriters laboratories founded in 1894. They promote safe working environments through testing, auditing and certifying products that use safer ingredients. **http://www.ul.com/resources/ecologo-certification-program**

GREEN SEAL

Green Seal is the most recognized of the 3rd party certifiers. They certify a broad category of products for safer ingredients and biodegradability. **http://www.greenseal.org**

DESIGN FOR THE ENVIRONMENT (DfE)

Design for the Environment (DfE) is part of the EPA (a government program.) They are now known as Safer choice. They certify products with safer ingredients than industry standards for both the environment and people. **http://www.epa.gov/saferchoice**

GREENGUARD

GREENGUARD Certification is part of UL Environment, a business unit of UL (Underwriters Laboratories). GREENGUARD Certification helps manufacturers create interior products and materials that have low chemical emissions, improving the quality of the air in which the products are used. **http://greenguard.org/en/index.aspx**

CLEANING EQUIPMENT

To properly clean a large room or workspace there are a variety of tools, products and equipment that can be used. In this section our guide will list and define the role of each critical type of cleaning equipment used in the janitorial industry today which are classified into vacuums, floor care equipment, window washing equipment, dusting tools and sanitizer and disinfectant dispensing equipment.

VACUUMS – A mechanical device with suction and airflow to remove debris from floors, upholstery, draperies, and ceilings. One of the best ways to keep a building clean and healthy is to vacuum! Today, most any surface can be vacuumed with the right tool making it one of the most productive and cost-effective pieces of equipment in your arsenal. Historically these have been powered with cords; but now cordless technology has advanced enough to replace them. Battery units are more expensive but they offer labor savings, lower noise levels and less downtime for repairs. They also allow the user to vacuum areas when power is not available, including elevators and stairwells.

CARPETS – Carpets cover 70% of all flooring in the U.S. There has been a trend to remove carpeting, with the belief that a building may be easier to clean without it. However, there is mounting evidence that unless dust mopping routines are significantly increased throughout the day, the filtering effects of carpet is far more beneficial to the building occupants.

- **UPRIGHT VACUUMS** – This type stands upright and features a suction base on wheels. To operate, push forward and pull back for cleaning. Most uprights feature a filter bag that has to be replaced when full and can be enclosed in plastic housing or a zipper soft outside bag. The motor is typically driven by a belt that turns the brush roller. There are two types of airflow through an upright.

  1. Direct air flow through the motor. This requires more maintenance as fan blades break and warp.

  2. Bypass flow where the dirt is directly deposited into the filter bag and 'bypasses' the motor. This feature is found in the more expensive vacuums

  Uprights can have a single motor or two motors. The two motor versions feature a separate motor for the brush roller which allows for some hard floor cleaning and wand use.

- **BACKPACK VACUUMS** – A shoulder strapped backpack style vacuum that one wears on the back or hips. They predominantly are used in the commercial cleaning industry because of their high productivity and ergonomics. With HEPA media, the indoor air quality is improved over upright vacuums. Backpacks offer the most versatility in a commercial environment. They can do detail work, high ceilings, pest control, hard surface and carpet vacuuming.

- **CANNISTER VACUUMS** – A cylindrical vacuum that can be vertical or horizontally mounted on wheels. These units are not as popular in the U.S. as they are in Europe but are still available. The main advantage to this vacuum is the powerhead options to offer a rotating brush while only using the weight of the wand to push around.

- **WET/DRY VACUUMS** – Commonly referred to as shop vacs. They come in many shapes and sizes. These have the ability to suck up wet or dry material. Cordless units are starting to appear on the market. Some of the options include HEPA filters, 1-2 or 3 motors, pump out for floods, front squeegee for faster pick up and dust containment for concrete grinding.

- **STICK AND HANDHELD VACUUMS** – Lightweight hand-held vacuum cleaners were originally made popular in the 1970's by Black & Decker. Stick models are more recent but this category was created for the residential market. They were not manufactured to run for the long hours demanded by the commercial markets.

- **ROBOTIC** – Around the 2000's, small robotic vacuums entered the marketplace. Again, these were developed for the residential market. Several companies have introduced autonomous auto scrubbers and vacuums. The software varies and how they map out a floor and the obstacles they encounter. The first autonomous software was called "Brain" and several manufacturers use this system. Newer technology now employs 2D lidar, 3D lidar; a camera system and avoidance software for obstacles. These also have options of auto dumping and refilling at their charge station. Currently, they are mainly used in large buildings and are very expensive, but all this will change in the next 5 years.

- **CENTRAL VACUUM** – Central vacuum cleaners, also known as built-in or ducted, are a type of canister/cylinder model which has the motor and dirt filtration unit located in a central location in a building, and connected by pipes to fixed vacuum inlets installed throughout the building. Only the hose and cleaning head need be carried from room to room, and the hose is commonly 8 m (25 ft) long, allowing a large range of movement without changing vacuum inlets. Plastic or metal piping connects the inlets to the central unit. The vacuum head may be unpowered, or have beaters operated by an electric motor or by an air-driven turbine. Typically, central vacuums are found in large residential homes.

FLOOR CARE EQUIPMENT – The first useful electric-powered floor machines date back to the early 1900s. The first floor machines were known as 'divided-weight' machines. With these machines, the bulk of the weight of the machine was on its rear wheels, which remained on the floor during operation. The buffer rolled in a push-pull fashion over the floor for both scrubbing and polishing. These early machines used brushes made of Tampico and Bassine, vegetable fibers used for centuries for floor scrubbing and polishing. To polish wood floors, carnauba wax would be applied to the floor, and then polished to a shine by going back and forth over the floor with the buffer. Divided-weight machines lacked sufficient speed, weight, and pressure over the brush to produce a high-gloss shine, and they were hard to maneuver. The major benefits for the user were that the machines were faster and less strenuous to use than polishing a floor by hand. The first high speed and variable speed machines were introduced around the late 1950s. An operator could adjust these machines to rotate at 175 to 350 rpm. During the 1960s, chemical manufacturers began introducing new types of floor finishes that produced a higher gloss shine if polished by a faster rotating floor machine. The finish could also be spray- buffed which helped maintain the shine and the floor's appearance for a longer period of time.

Floor cleaning technology continued to advance; which allowed a floor to look good over a longer period of time.. By the 1970s, rotation speeds of 750 to 1,000 rpm were common. Because of the higher rpms, some floor finishes fractured or were otherwise damaged, and often pads would quickly degrade. Improved floor pads were introduced, and new finishes produced an even higher-gloss shine. Ultimately, the pad and chemical manufacturers introduced products that are more durable and capable of handling machines up to 3,000 rpms. The trends for today include even more sustainable equipment such as machines with the ability to change modes from economy to bursts of increased power depending on the soil level on the floor. Newer innovations include orbital machines and battery operated burnishers. Machines with fewer parts are helping to reduce the cost of floor scrubber ownership. Other innovations are machine location tracking, diagnostics, usage and performance data. Improved maneuverability and mobility have become highly desirable.

These machines and technology continue to advance to this day. The most commons types of automated floor machines are:

- **AUTO-SCRUBBERS** – Auto scrubbers are machines that combine a floor machine, dilution control and a wet/dry machine into one unit that has the ability to do deeper cleaning and cover more square footage, while using less labor hours.
- **CARPET EXTRACTORS** – cleans and shampoos carpets. There are three types of Carpet Extractors. All of them can include hot or cold water or low moisture methods.

  1. **Box Extractors** – boxy looking machines that utilize a wand to both spray and extract the shampoo.
  2. **Walk Behind Extractors** – These are operated by pulling in a backward motion and are available in many sizes. A wand can be added to the machine for hard to reach areas.
  3. **Riding Extractors** – These are used in large buildings

- **FLOOR SWEEPERS** – Floor Sweepers were designed for large area debris pick-up on smooth indoor surfaces. Outside models have stiffer brushes for picking up wet leaves and sand in parking lots and along curbs.
- **BURNISHERS** – shines floors into a high gloss. Burnishers are high speed machines developed to polish floor finishes and concrete. RPM speeds run from 1000 to 3000 RPM's. Standard units are corded but battery and propane models are available.

WINDOW WASHING TOOLS – The window-washing profession has been around as long as glass pane windows have been a part of commercial and residential properties, which is quite a long time. Modern window-washing techniques and tools have a deep history, and many of the companies that revolutionized window cleaning are still in business today. In 1936, a Mr. Ettore Steccone designed an early iteration of the modern squeegee we still use today. Unger, founded in 1964, has had a massive impact on both the history and future of window-washing and have been in business for over half a century now.

- **SQUEEGEE** – The "Chicago squeegee" was commonly used in the early 1900s, but it was a bulky tool that required 12 screws to be loosened just to change the blades. Once Ettore's squeegee hit the market, window washers quickly realized it was a superior tool and the Ettore company was born. Up until the early 1900s, window cleaners were still using a squeegee as their primary tool of the trade until pure water-fed poles began getting introduced.
- **WATER FED POLE** – As technology advanced and buildings grew higher, the need for a safe way to reach taller windows became a factor in window-washing tool development. These poles consist of fiberglass or graphite and can reach as high as 5 stories from the safety of the ground. They are used in conjunction with pure water which leaves no residue, no mineral deposits or streaks. These systems are the superior choice for many different applications within the industry. Most commercial cleaning companies prefer to use water-fed pole systems, especially since the introduction of tighter health and safety laws governing ladders.

MICRO-FIBER TOWELS AND MOPS

It is simply one of the best inventions to hit the cleaning industry in the last 20 years. Microfiber is a generally a blend of polyester and polyamide woven into one thin fiber (100 times smaller than a human hair). They are bound together to make individual fibers that you can see. These fibers are then split forming many cleaning edges. The edges allow the fibers to reach into the minute pores of a surface and pull out dirt and bacteria. These fibers have a positive charge to attract and hold dust and absorb up to 7 times their weight in water yet are lint free and machine washable. It is known that just microfiber and water can remove 99% of bacteria. Using microfiber products is a simple way to green your process. Due to their aggressive scrubbing action and wicking properties microfiber uses less water, less chemical and have faster dry times. They do not promote bacteria growth and leave no streaks or residue. They are color coded to eliminate cross contamination and available in towels, tube mops, flat mops, carpet bonnets, polishing pads and dusters.

There are endless possibilities from laying floor finish, spill cleanup, wiping down toilets and urinals, window washing, ceiling fans, dusting, polishing floors, stainless steel/ brass cleaning, cleaning leather and wood and desks and countertops.

Some companies manufacture specialty maid carts that can carry pretreated floor pads for disinfecting or daily cleaning. These carts can carry daily restock items as well as, other tools and trash cans.

Pricing varies because of different gram weights and backing materials used, which also effect how many times they can be laundered. In washing microfiber there are 3 things not to use in a commercial laundry system. No Bleach, no high Heat and no fabric softener as these will shorten the life and the positive dust attraction properties of microfiber.

DUSTING TOOLS – As the twentieth century approached the cleaning industry began to accelerate with the advent of the vacuum and even various types of automated floor care machines. However, janitors realized that in order to properly clean one must dust first so that all of the dirt, bacteria and debris is now on the floor and can be sucked up. Dusting tools became popular and in demand. Products like:

- **FEATHER DUSTERS** – A feather duster is an implement used for cleaning. It consists typically of a wooden-dowel handle and feathers from either the male or female ostrich bird that are wound onto the handle by a wrapped wire. Dusters vary in size but are most often between 14 to 32 inches (36 to 81 cm) in total length. Some dusters have a retractable casing instead of a dowel handle. These dusters are typically used by rack-jobbers and merchandisers who need to dust store shelves, and like to retract the feathers into the handle to avoid damage.

  After ostrich feathers, lamb's wool became a staple duster. Today, microfiber and treated synthetic materials have replaced the original feather duster. Other companies like ProTeam have developed vacuuming tools to reach upwards of 25 feet to effectively remove dust from pipes and vents while controlling the particle fallout.

- **DISPOSABLE DUST CLOTHS** – a new trend is disposable dust sheets. These non-woven fibers are coated with an adhesive and are perforated for easy use. They can be used in the hand or attached to common dusting and floor tools. Use both sides until dark and then dispose in the trash.

MOPS

There are a variety of different types of mops that are used to not just clean floors and surfaces but also to apply cleaning chemicals and floor finishes. Mops have several styles of categories: Cotton cut end mops (100% cotton mops that are cut at the end) are the least expensive with cotton, synthetic bended looped end mops (mops that are looped and sewn with a band at the bottom) being the most commonly used because they can be laundered and finally specialty mops like finishing mops or micro-fiber mops offering unique performance charactistics in select applications being the most expensive. When mops were initially introduced they were classified by ounces like 24 oz or 32 oz which equated to the amount of fabric in each size of mop. As time went by mop manufacturers began to use # symbols rather than ounces next to the mop sizes in order to offer lower prices. For example a # 24 mop might only weight 20 ounces hence it would cost less than a true 24 oz mop. Today mops can be still be purchased by weight as well as by # symbol.

MOPS

LOOP-END WET MOPS

Cotton Blend, 5"HB, Launderable

Cotton Blend, 1.25"HB, Launderable

Cotton Blend, 1.25"HB, Launderable

Rayon, 1.25"HB, Launderable

Finish Mop, 1.25"HB, Launderable

CUT-END WET MOPS

Finish Mop, 1.25"HB, Launderable

Nylon Finish Mop, 1.25"HB, Launderable

Synthetic Blend, 1.25" HB, Not Launderable

Synthetic Blend, 1.25" HB, Not Launderable

Color-Coded Cotton Blend, 1.25" HB Not Launderable

SCREW ON WET MOPS

Finish Mop, 1.25"HB, Launderable

Cotton, 1.25" HB, Not Launderable

Rayon, 1.25" HB, Not Launderable

Rayon, 1.25" HB, Not Launderable

Synthetic Blend, 1.25" HB, Not Launderable

MICROFIBER WET MOPS

Synthetic Blend, 1.25" HB, Not Launderable

Color-Coded Cotton Blend, 1.25" HB Not Launderable

String, 1.25"HB Looped-End, Launderable

Tube, 1.25"HB Looped-End, Launderable

Tube, 5"HB Looped-End, Launderable

MICROFIBER FLAT MOP PADS

Microfiber Wet Mop Pad

Microfiber Wet Mop Pad With "W" Scrubber

Microfiber Wet Mop Pad With Scrubber

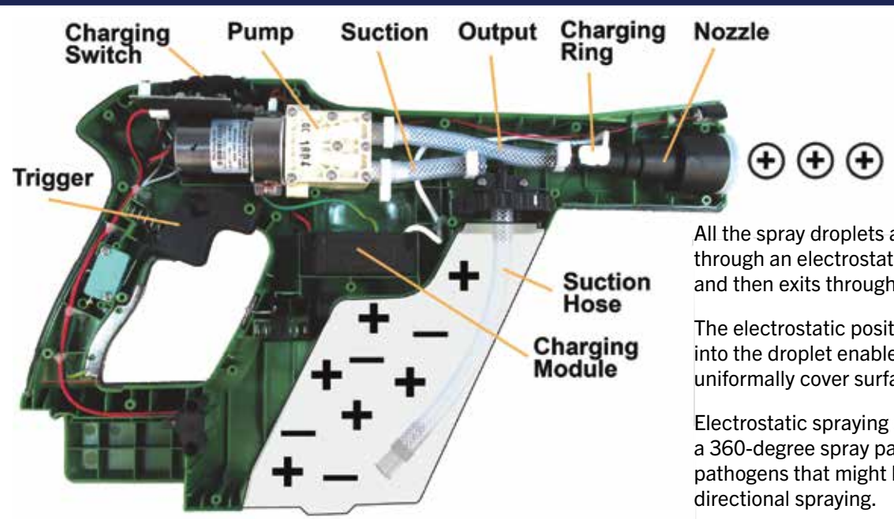
Microfiber Finish Mop Pad

PurTrap Microfiber Disposable Mop Pad

SANITIZING & DISINFECTANT DISPENSING EQUIPMENT – once an area has been dusted, vacuumed and washed down the next step is to sanitize or disinfect the floors and surface areas. In order to do that, janitors use the following types of equipment:

- **DILUTION CONTROL SYSTEMS** – dispenses the right ratio of chemical and water from one concentrated container into a smaller spray bottle, mop bucket or autoscrubber.
- **SPRAY BOTTLES** – the plastic spray bottles are used to spray disinfectants and sanitizer onto surfaces. Some bottles can be screwed into water systems with hoses to dilute concentrates and extend operating time.
- **FOGGERS** – Fogging a room is a very effective method to disinfect both air and surfaces. Labor dollars are saved as no one stays in the room. Various chemicals affect the time involved.
- **AQUEOUS OZONE CADDY SYSTEMS** – recent developments in state of the art cleaning technology has led to the introduction of a dispensing system that manipulates the aqueous ozone molecule in the air and dispenses it back out as engineered water that can actually be used as a cleaning agent and a sanitizer.
- **ELECTROSTATIC SPRAYERS** – This newly emerging technology uses patented system in both a handheld or backpack that sprays a disinfectant solution around objects in a 360-degree pattern. Chemicals used must be approved to be used in the sprayer and the dwell time must still be adhered to. Too often they are sprayed very quickly and not enough disinfectant is applied to kill the bacteria or virus.

HOW DOES AN ELECTROSTATIC SPRAYER WORK



All the spray droplets are pumped through an electrostatic charging ring and then exits through the nozzle.

The electrostatic positive charge inserted into the droplet enables the droplet to uniformally cover surfaces.

Electrostatic spraying systems apply a 360-degree spray pattern to target pathogens that might be missed with one directional spraying.

MATTING

Entrance matting is often overlooked in a building. Matting is typically purchased for one of the following reasons; slip and fall risks, company logo's, anti-fatigue or dirt removal. Matting is important for air indoor quality and to protect the floor finish. When done right, matting can enhance the building, not degrade it. Too often though,it is not maintained, is ugly and worn out therefore; it doesn't do the job it was originally intended.

To obtain Leed certification, all main entrances must have at least 10 feet of matting. This can be a combination of both interior and exterior matting. To protect the floor and keep most of the contaminants out of a building it requires 4 -5 steps on the matting. The more steps, the more debris is removed from your shoes. This method should be the standard for all buildings whether you are trying to get Leed certified or not!

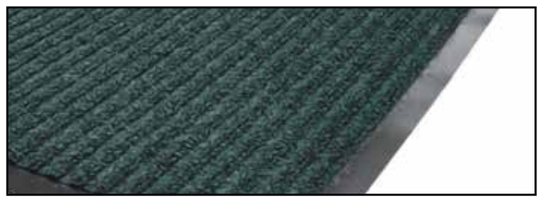
Better grade matting is money well spent. The denser the mat the more durable it is plus the heaviness helps with the mats sliding and curling. Price is determined by the backing material, thickness of mat, denseness of material and the material itself. Edging also plays a role and come in several widths. There are several types of matting available.

BERBER – The most durable of the carpet mats series desired for high traffic areas. Multi directional scraping action.

RUBBER – Heavy duty waterproof mat. A variety of styles and patterns available. Great scraper ,but it doesn't absorb moisture off of shoes.

POLYPROPYLENE MATERIAL

NEEDLE RIB – Lesser grade matting using a ribbed pattern for scraping dirt. They are also made in a chevron "V" pattern design



ANTIFATIGUE – These are mats designed for jobs that require a lot of standing. They can be backed with a sponge-like material for softness or made of a blown rubber. There are many styles and degrees of softness to suit any need. They may even feature a safety yellow edge.

NONWOVEN POLYPROPYLENE

OLEFIN – Most common of entry level mats. It is lighter in weight and will show traffic patterns. Dries quickly and is stain resistant

KITCHEN MATS – Typically made of rubber and grease resistant for the high heat and food grease found in this environment. Most feature perforations to allow water and oils to fall to the floor and reduce slip hazards. Various thicknesses and widths available.

WIPERS

There are a lot of wiper options to choose from when the need to clean arises. It really comes down to what type of cleaning needs to be done which can then help decide which wiper makes the most sense to use in any given operational application. Listed below are a variety of different types of wipers used in the Jan/San industry for cleaning.

AIRLAID TOWELS – consist of a soft non-woven material with high absorbency, low linting properties. Ideal for oils, grease and inks or as a general wiper or napkin. More absorbent than paper or linen napkins.

SCRIM TOWELS – are made from a reinforced nylon threaded material that is strong, durable and low linting. The towel's multiple layers create an economical wiping tool with extra scrub strength and superior wipe-dry properties. Ideal for glass and smooth surfaces or as a general wiper.

DRC (DOUBLE RE-CREPED CELLULOSE) TOWELS – are a non-woven wiper made of wood pulp and binders that makes the towel very durable. The double creped process gives the material a unique stretch, softness and wipe-dry capabilities with medium linting properties. Excellent absorbency in water, grease and oil.

SPUNLACE TOWEL – is constructed of wood pulp and textile fibers that are bonded together using hydro manufacturing technology. Since there are no chemical binders, hydro material is solvent resistant. Absorbent with a cloth like feel and strength, even when saturated. Considered lint free.

NON-WOVEN SYNTHETIC WIPERS – are made from synthetic non-woven material and are ideal for foodservice applications and general wiper applications.

MELTBLOWN WIPERS – are great for use in cleanrooms because it leaves little to no lint on surfaces. Also resistant to corrosive liquids.

COTTON SHOP TOWELS (RAGS) – Made from 100% cotton fabric and comes in various sizes. Cotton is very absorbent and can be a low-cost alternative to re-usable synthetic wipers.

HYDROKNIT TOWELS – is made of soft pulp fibers bonded to a polypropylene base sheet for durability, absorbency and tear resistance. Wiper with HYDROKNIT* technology is ideal for wiping machines and parts, wiping up metal shavings, prepping surfaces with solvents as well as cleaning rough surfaces.

MASSLINN TOWELS – Masslinn is essentially an oil impregnated dust cloth. When used it picks up dust and leaves a slight shiny oil film. Made with dust-catching fibers and mineral-oil treated for increased dust pickup and enhanced finish, these cloths are an ideal choice for heavy dusting of floors and large surfaces with high traffic.

SQUEEGEES

The squeegee is a very useful tool. It is capable of not only moving large amounts of liquids but drying flat surfaces, especially windows. It should be a standard for any janitorial closet for regular cleaning tasks, deep restroom cleaning and emergency flooding.

The 2 most common types are window squeegees and floor squeegees. Not as well known are ones used for roofing and tar-asphalt

Both floor and window feature different lengths, shapes and materials. There is a science to making the actual squeegee material. Some of the materials used are synthetic rubber (EDPM) and Moss natural rubber, closed cell foam rubber, silicone, and nitrile. These all have different temperature ranges, density, flexibility, fuel and oil resistances, fluid retention, abrasion resistance and UV and ozone tolerances.

The squeegee material can be double or triple layered or sometimes 2 different materials are used to maximize the effectiveness of both types.

The channel or head materials used in squeegees are typically, aluminum, stainless steel, brass, steel, or plastic. They can be curved or straight and range from 4 inches to 36 inches in width. Almost any handle material and length can be used depending on the socket designed into the head. Color coding heads are available for foodservice and hygiene situations.

SAFETY EQUIPMENT

As it is written in so many company manuals "You can never be safe enough in your operational protocol." In fact, safety should always be on everyone's mind when working with chemicals and cleaning equipment. While no one wants to get hurt it happens every day. Accidents like: razor cuts, falls, chemical burns, or dropping objects on one's self or someone else can be not only an unpleasant circumstance but it could mean life or death too.

Workplace injuries and accidents that cause employees to miss six or more days of work cost U.S. employers $59.9 billion in 2014, the most recent year for which statistically valid injury data are available from the U.S. Bureau of Labor Statistics (BLS) and the National Academy of Social Insurance, according to the 2017 Liberty Mutual Insurance Workplace Safety Index.

The causes of slip and fall incidents are varied and include[1]:

- Walkways that are wet, oily, or otherwise contaminated
- Floor surfaces that are in disrepair
- Loose or unanchored mats or rugs
- Spills
- Weather hazards (such as ice, rain or snow)
- Lack of employee training
- Inappropriate footwear

The best practice is to be as prepared as possible and observe your surroundings. To be safe, you need to create a safe zone for you. Placing safety cones, wet floor signs & temporary barricades is required. Wearing the proper attire and PPE is very important

PERSONAL PROTECTION EQUIPMENT (PPE)

OSHA requires that all employers provide the appropriate PPE and that it is used and maintained in a sanitary and reliable condition to protect workers from safety hazards.

The minimum protection level start with goggles and gloves. You should not start any task without these 2 items, and they should be carried with you throughout the day.

Hearing protection, hard hats, high visibility clothing, protective footwear and breathing masks may be required for certain tasks. With the Covid-19 virus everyone learned the importance of masks and gloves. Naturally, there are different grades of these items and make sure you select the right size and appropriate level for the task at hand.[2]

1 Source:ISSA
2 Source: OSHA: Personal Protective Equipment – 29 CFR 1910.132-138

GLOVES

There are a variety of different types of disposable gloves that are used in the jan/san industry primarily for dusting, cleaning, safety and especially working with chemicals. The different classification of disposable gloves are as follows:

SYNTHETIC (NEOPRENE) GLOVES: are made from a synthetic rubber with a high chemical and heat resistance.

NEOPRENE GLOVES: A synthetic rubber glove material resistant to oil, heat, and weathering.

NITRILE GLOVES: are manufactured using synthetic latex, contain no latex proteins, and are three times more puncture resistant than natural rubber. They offer superior resistance to punctures and abrasions and are also used for protection against a variety of chemicals. Nitrile material also has a naturally low coefficient of friction, making these gloves easy to put on.

LATEX GLOVES: a latex glove is made from natural rubber latex and is a processed plant product. Latex gloves are the most flexible and resilient with a consistent fit. They are a great barrier protection against infection and contamination. These gloves are available in Powdered or Powder-Free, as well as Exam or General Purpose. Some people have allergic reactions to latex, so monitoring peoples reaction is critical to their well-being.

POLYURETHANE (POLY) GLOVES: A synthetic material with high abrasion resistance. It is chemical resistant and very flexible. Polyurethane offers the elasticity of rubber combined with the toughness and durability of metal. Urethanes have better abrasion and tear resistance than rubbers while offering more strength. Polyurethane offers excellent wear properties, flexibility and elastic memory. It is resistant to oils, solvents, fats, greases and gasoline. Polyurethane will remain flexible down to -90°F and in hot water up to 175°F.

PVC (POLYVINYL CHLORIDE, KNOWN AS VINYL) GLOVES: protect against a broad range of low hazard chemicals. PVC has moderate strength, good weather resistance and retains its shape. It is non-toxic and has good electrical insulating properties.

LEATHER GLOVES: Gloves made of goat or cowhide and typically used more in heavy duty work such as construction, cleanup/debris removal, landscaping and concrete work.

GLOVE GLOSSARY

These are terms that you will encounter when discussing gloves. Call us when you encounter a term that you don't find in this list or that requires clarification.

ALLERGEN CONTENT – Measure of glove's known allergy issues relating to its construction.

AMBIDEXTROUS – Gloves that can be interchangeably used on left or right hand.

AQL – Acceptable Quality Level standard.

B GRADE – Medical-grade gloves that have been rejected, sometimes resold as multipurpose-grade gloves. Also, a grade commonly used for a middle quality leather glove.

BARRIER INTEGRITY/PROTECTION – Glove's ability to serve as a protective barrier for a worker.

BLEED – Dye transfer from glove fabric to wearer's hands.

CE – Critical Environments; another name for a clean manufacturing environment.

CHEMICAL RESISTANCE – A glove's ability to resist a specific substance agent.

CHLORINATION – Cleaning of gloves to provide fewer allergic reactions by lowering protein levels; process also makes "slicker" gloves that are easier to don.

CLUTE STYLE – Seams sewn on back of glove at every finger and straight thumb; palm side constructed of one continuous piece of material.

CONTINUOUS PULL – A reinforced seam created by extending palm material and overlapping the cuff.

CONTINUOUS THUMB – Common glove construction utilizing a solid piece of leather and eliminating seam on the palm.

CUFF – Bottom fabric of a glove, designed for wrist protection.

CURING – Also called vulcanization. Compound strengthening of glove material using heat or chemicals.

CUT AND SEWN – Common manufacturing process for gloves. Fabrics like canvas, jersey or leather are cut using a pattern, and the pieces sewn together to make a glove.

GLOVE GLOSSARY (CONTINUED)

CUT RESISTANCE – A glove's ability to protect a worker from sharp objects.

DEGRADATION – Material breakdown in a glove, from frequent use or exposure to the elements.

DENIM – Economical, single-layer fabric used in some leather-palm glove construction and in industrial aprons.

DIPPED GLOVES – Unsupported gloves manufactured by submerging a ceramic mold into a polymer. Coated gloves are created using a fabric stretched over a mold and then polymer dipped.

DON – Act of inserting a hand into a glove.

DONNING POWDER – Added to gloves to ease donning and enhance comfort of glove.

DUCK – A launderable, single-ply cotton material used in glove construction.

ELASTICITY – A glove's ability to stretch and return to its natural form. Also called "Elongation".

EMBOSSED FINISH – A textured finish created in manufacture of poly gloves; helps with wet grip.

ESD – Electrostatic Discharge or static build-up, which can harm electronic components.

EXTRACTABLES – Leaching of chemicals used to make gloves; a concern to critical or clean-manufacturing environments.

FABRIC WEIGHT – Usually expressed as "8-ounce", "24-ounce", etc. Refers to the weight of a full square yard of fabric from which glove is sewn.

FACTORY SECONDS – Medical-grade gloves rejected on basis of quality; often sold as multipurpose or B-grade gloves.

FDA 510K – For medical-grade gloves, the FDA issues approval document known as a 510K. This document dictates intended use of the glove.

FINISH – Outside texture of a glove.

FINGERTIPS – Reinforced leather protection and wear feature built into gloves.

FLEECE LINING – Soft, cotton material added to leather gloves for additional warmth and to reduce abrasive chafing.

FLESH SPLIT – Leather from layer of hide separated from outer skin or top-grain layers. Flesh split leather is typically more fragile than top grain.

FLOCK LINED GLOVES – Gloves incorporating an inner liner to improve comfort.

FOAM LINING – Internal polyurethane layer generally covered by fleece or flocked-lined with nylon to provide added warmth.

FORM, FEEL, AND COMFORT – Define overall fit, comfort and dexterity provided by the glove.

FOURCHETTE – Additional sidewall area between top and bottom of glove fingers.

FORMER – Hand mold that is dipped into a polymer compound to shape the glove.

FORMING – In glove manufacture, the finishing process that straightens seams and completes appearance.

FULL FIRST FINGER – Glove style without a seam on outer finger edge. Absence of seam increases durability of heavy-wear surface.

FULL LINING – Two layers of protection or a "glove within a glove".

GAUNTLET CUFF – Wide band of bonded material sewn to glove as a cuff for extra protection. Design facilitates quick removal of gloves.

GLOVE MEMORY – A glove's potential to form to user's hand, providing maximum comfort and reduced fatigue.

HEEL OR CONTINUOUS PULL – Extra leather portion of a short cuff or gauntlet leather palm glove that reinforces cuff seam while donning gloves.

INSEAM CONSTRUCTION – Seams sewn on the inside, protecting it from abrasion and wear.

KEVLAR® – A synthetic, high strength used especially as a reinforcing agent in the manufacture and protective gear such as helmets, gloves and vests.

KEYSTONE THUMBS – Reinforced inset thumbs that are double-sewn and feature twice the thickness at critical wear point for durability and added comfort.

KNIT WRIST – Band of elastic material sewn as a cuff to secure glove on user's hand and prevent debris from entering the glove.

KNUCKLE STRAP – Band of leather sewn across back of a glove to protect knuckles.

LANOLIN – Common name for wool wax, which is readily absorbed into skin, conditioning user's hands as gloves are worn- common in sheepskin gloves.

LATEX ALLERGY – Reactions caused in some people by contact with natural rubber latex.

LEACHING – Process of cleaning latex gloves to lower potential for latex allergy.

LINING – Fabric within a glove to provide added warmth or comfort.

LOW PROTEIN – Gloves proven to contain less than 50u grams of protein, the minimum allowable claim by FDA.

MIL – Metric measurement used to determine glove thickness. 1 mil = 1/1000 inch.

NAP – Woven fibers, which appear "fluffy" in fabric gloves.

NOMEX® – Nomex® (styled NOMEX) is a registered trademark for flame resistant meta-aramid material developed by DuPont. Nomex® is commonly used in industrial workwear and gloves.

OSHA – The Occupational Safety and Health Administration is an agency of the United States Department of Labor with the mission of preventing work-related injuries, illnesses, and occupational fatality by issuing and enforcing standards for workplace safety and health.

OUT-SEAM-SEWN – Seams that are sewn on the outside surface of a glove. Seldom used in work gloves because of abrasion exposure. Due to absence of an inner seam to abrade the hand, out-seam gloves are considered to be more comfortable.

PARA-ARAMID – Para-aramid is a type of fiber that (like Kevlar®) that possesses outstanding strength to weight properties. These fibers also have excellent resistance to abrasion and no melting point. Degradation starts from 500°C.

PILE LINING – Coarse acrylic material applied to inside of gloves for added warmth.

PLASTICIZED CUFF – A cuff reinforced by adding waterproof adhesive between two layers of fabric.

PLASTICIZERS – Chemical components added to synthetic gloves to modify form, fit and function.

PILE – A common fleece fabric of 70% Orlon, 15% cotton and 15% polyester that adds warmth. Its preformed design molds to user's hand.

PINHOLE TEST – Quality control test to determine leakage in a glove.

POLYETHYLENE – Synthetic glove material created through polymerization of ethylene.

POLYMER – Synthetic material used as a coating on gloves, such as PVC, vinyl, neoprene, nitrile or rubber.

POWDERED – A glove that is dusted with corn starch for moisture absorption and easy donning.

PROTEIN CONTENT – Refers to quantity of protein in latex rubber. Higher protein content in gloves can contribute to latex allergy.

PUNCTURE RESISTANCE – A glove's resistance to sharp objects.

PPE – Personal Protective Equipment that, among other things, could include gloves, eyewear and vests.

REVERSIBLE GLOVES – Commonly constructed from jersey material with a single seam sewn around the glove. Reversible styling enables ambidextrous use of the glove.

RESISTANCE – Glove's ability to shield user from chemicals or adverse work environments.

ROLLED BEAD CUFF – Reinforced cuff formed by rolling material up into thicker band at base of glove.

RUBBERIZED CUFF – Water-resistant cuff common in gauntlet and safety gloves. Two layers are bonded together with special rubber-based adhesive.

SAFETY CUFF – Wide band of bonded material sewn to glove as a cuff. Gloves with safety cuffs are designed for rapid removal.

SEMI-WING THUMB – Gloves that enable natural thumb placement with no seam on palm.

SHOULDER SPLIT – Strong and durable suede leather taken from side of the cow.

SHIRRED WRIST – Glove that offers snug fit with elastic band sewn into wrist area on back of glove.

SIDE SPLIT – Thicker and more durable than shoulder-split leather. Side-split suede is used in harsher work environments.

SILICONIZATION OR COPOLYMERIZATION – An external glove treatment that can improve comfort and grip in a wet environment.

SKIN FREE CONTACT MANUFACTURING – A unique manufacturing process where medical gloves are untouched by human hands.

SLIP-ON STYLE – Cuff-free glove such as drivers' gloves.

STARCHED CUFF – A band or safety cuff created by two layers of fabric laminated and hardened with starch.

GLOVE GLOSSARY (CONTINUED)

STRAIGHT THUMB – Glove thumb is parallel to index finger; common in most fabric gloves and drivers' gloves.

STRING KNITS – Single-body construction of fabric gloves machine- knit as opposed to sewing pieces of material together.

SUPPORTED GLOVES – Gloves manufactured using a chemical-resistant shell or lining.

TACTILE SENSITIVITY – Glove's ability to provide dexterity and a realistic feel.

TANNING – Coloring, softening and adding preservative oils to prepare leather for glove manufacture.

TENSILE STRENGTH – Glove's resistance to tearing when stretched.

TEXTURE – Finish to glove palm that allows for improved grip.

THERMAL – Material lining for gloves; designed to trap air and insulate against cold.

THINSULATE® INSULATION – Thinsulate® is a trademark of the 3M corporation for a synthetic fabric that is lightweight, breathable and durable providing warmth without being bulky.

THUMB SHIELD – Drivers' and leather palm styles often feature extra leather sewn in the thumb-to-palm seam to improve durability against abrasion.

3/4 BACK – A style of leather-palm glove where back of leather wraps 3/4 of the way from fingertips to wrist.

TOP GRAIN – Outer layer of animal hide.

TWARON – Twaron is brand name for a para-aramid, a strong, heat-resistant synthetic fiber developed in the early 1970s by Dutch company Akzo Industrial Fibers.

UNSUPPORTED GLOVES – Gloves lacking a fabric lining.

WELDER'S GLOVE – Leather and gauntlet-style gloves lined to protect against heat and welding sparks.

WELT – Narrow leather strips added to seam areas to prolong glove life.

WING THUMB – A glove offering improved comfort due to thumb diagonal across the palm. These gloves have no seams on the wearing surface, allowing better thumb dexterity.

MASKS

Selecting respirators appropriate for your workplace can be a daunting task. Respiratory protection program managers need to understand the airborne hazards in their facilities, determine the required assigned protection factor for a respirator, choose what type of respirator is needed (air-purifying or atmosphere-supplying, tight-fitting or loose-fitting) and make sure each employee's respirator fits properly.

The term "N95 respirator" gets thrown around a lot because it is one of the most common types of respirators. In this post we're going to take a look at what that term (and similar terms like R99 and P100) mean. Understanding these labels is important for both employers and employees because both need to know the respirators being used are sufficient for the hazards present.

NIOSH CERTIFICATION LEVELS FOR PARTICULATE FILTERING RESPIRATORS

For a respiratory protection program to be OSHA compliant it must use respirators certified by the National Institute for Occupational Safety and Health (NIOSH). NIOSH, a division of the Centers for Disease Control (CDC), has 10 classes of

approved particulate filtering respirators.

Note: Particulate filtering respirators belong to the air-purifying respirator category, meaning they remove hazardous particles from the air. Two main styles of respirators fall into this category: filtering facepiece respirators and elastomeric respirators. Powered-air purifying respirators (PAPRs), which use a battery-powered blower to move air through the filter (making it easier for breathe) are also available.

These 10 classes specify two things: the amount of particles filtered by the respirator and whether the respirator is resistant to oil. In the list below, the letter indicates whether a respirator is resistant to oil and the number indicates the percentage of airborne particles the respirator will filter.

- **N95, N99, N100** – These respirators are not resistant to oil (think N for "not resistant") and filter 95%, 99% or 99.97% of airborne particles.
- **R95, R99, R100** – These respirators are somewhat resistant to oil (think R for "resistant") and filter 95%, 99% or 99.97% of airborne particles.
- **P95, P99, P100** – These respirators are highly oil resistant (think P for "oil proof") and filter 95%, 99% or 99.97% of airborne particles.
- **HE (HIGH EFFICIENCY PARTICULATE AIR)** – These filters are only used in powered air purifying respirators (PAPRs). These devices filter 99.97% of airborne particles.

These certifications can apply to either disposable filtering facepiece respirators that cover the nose and mouth or filters that are inserted into reusable elastomeric respirators. Companies that make respirators must submit their product to NIOSH for testing, so all NIOSH-approved respirators have gone through a thorough vetting process.

HOW TO IDENTIFY NIOSH-CERTIFIED RESPIRATORS

Manufacturers clearly label their products so you can easily see whether a respirator is NIOSH-certified. All approved respirators have an approval number (or TC number) on the product's label within the packaging. Filtering facepiece respirators may also have an N95 (or similar) number printed on the respirator itself along with a NIOSH logo.

FRAUDULENT RESPIRATORS

Fraudulent respirators are a problem in the marketplace. In some cases these respirators are labeled with "N95" or the NIOSH logo, but they haven't actually gone through NIOSH certification or they've been rejected by NIOSH. Oftentimes these products are sold for less money than certified respirators, so the prices tempt cost-conscious companies. Safety managers and others responsible for purchasing respirators should confirm their selections have legitimate NIOSH approval. They can do so by checking NIOSH's Certified Equipment List.

ALTERED RESPIRATORS

Some companies also sell respirators that have been altered in some way, often to make them look more fashionable. Adding decorations or fabric to a respirator voids the product's NIOSH certification, and doing so can pose health risks. Respirators decorated with additional cloth can make it more difficult to breathe and even cause carbon dioxide to build up in the mask. Taping, gluing or stapling anything to a respirator can cause contaminated air to leak through the respirator.

ADDITIONAL NOTES ABOUT NIOSH CERTIFICATION

Finding NIOSH-certified respirators for your workplace should not be too difficult, as the NIOSH list of approved devices includes over 7,000 products. Just make sure the respirators you choose are appropriate for the hazards in your facility. If your workplace has oil in it (perhaps for use in machines), consider whether an R or P class respirator would be best.

For workplaces in the healthcare industry, also keep in mind that NIOSH does not certify surgical masks, as they are intended to protect patients, not provide clean air for the wearer. NIOSH also doesn't evaluate how effective respirators are at preventing specific illnesses. The FDA evaluates those claims.

For more information about OSHA's respiratory protection standard (1910.134) and selecting appropriate respirators, read this blog post or visit NIOSH's Respirator Trusted-Source Information page.[1]

1 SOURCE: https://www.safetyblognews.com/respirator-certification-what-does-n95-really-mean/

WASTE DISPOSAL

One aspect of proper cleaning is setting up the right waste disposal system in your home, office, restaurant or manufacturing plant. Allowing germs to populate and migrate around any environment can lead to food borne illness and diseases. Waste disposal comes in many forms and in order to go about channeling it properly into it's ultimate destination the following protocols should be followed:

Identify and define the waste you are channeling to dispose. For example, what is it that you are throwing away? Is it food scraps, consumer packaging, old chemicals, yard waste or even human waste?

Waste disposal receptacles should be used. Food scraps and yard trimmings should be dispensed into a green compost can, consumer packaging should be recycled into a blue can, old chemicals should be taken to a hazardous waste center or properly stored in a hazardous storage receptacle and human waste should be flushed down a toilet or contained inside of sealed plastic trash bag. Waste comes in many forms and must be channeled into it's appropriate waste streams and dispensers in order to avoid sending it to the wrong destination where it could be harmful to someone else.

Gloves are the key to safely dispensing waste and assisting in channeling it to the right destination. Gloves keep our skin safe from harmful chemicals and protect our hands from germs and bacteria that can lead to disease.

Trash bags are the key to blocking out odors and preventing waste from leaking through to the bottom of a trash can receptacle. Can liners are different than trash bags in that they are typically made from high density polyethylene resin and are designed to line the inside of a trash receptacle for lighter weight trash like paper towels and office paper. Trash bags are typically made from low density polyethylene, stretch a lot, and are designed to harbor and hold heavier duty waste and trash.

Disinfectants and sanitizers should also be used to clean and sterilize the waste disposal receptacles so that any bacteria or germs that leaked out is eliminated and prevented from spreading during future use.

Most trash and various types of waste end up being channeled through the local waste collection company where it is sorted and then sent out to landfills.

In 2019, around 35 million tons of plastic were discarded in North America. On average, only 6-7% of it is actually recycled and just 7% of it is combusted in energy facilities which create electricity or heat from garbage. As a result, the rest of it, or around 18 million tons of plastic, ends up in landfills.

LANDFILLS

The average person discards 4.6 lbs of trash per day. Approximately 258 million tons (232 million metric tons) of trash, or solid waste, is generated in the United States each year [source: EPA]. Have you ever wondered where your foodservice packaging trash goes? Well, depending on the city you reside in, it's collected by three different trucks. One is a trash truck, the second is a recycling truck and the third is a green waste collection truck. Each collection company deposits it all at a material recovery facility where it is sorted for its end of life destination. In the past it used to be just one truck. That one truck deposited it all into a landfill. A landfill is a large property of land where garbage and waste materials are dumped into a vast hole that is covered over with protective layers that prevent seepage into ground water and allows for new habitats to emerge when it's completely full. However, landfills are expensive to manage and they have to operate without trapping the thousands of tons of methane and carbon dioxide gases that emit from below up into the ozone each year due to the trapped waste below cooking in an anerobic environment.

Due to the new directives set in place by many local city and county governments, waste is being rechanneled and diverted away from landfills.

Today, although landfill gases are a significant contributor to the depletion of our ozone (landfills produce a total of 18% of all U.S. Green House Gases or GHG), new cutting-edge technologies are allowing landfill operations to minimize the escaping landfill gases and even trap or capture the emissions, which are then converted into electric power. Although landfills serve a purpose for our waste volumes today many states, like in California, have new mandates to achieve zero waste by rechannelling all of the waste away from landfills through expanded recycling and compost collection programs.

CAN LINERS

One might think that can liners, also known as trash bags, are a simple product to buy for a restaurant, hotel or an office building. They can be if you don't care about the bag's size, its thickness, the type of resin the bag is made out of, or the style of the bag for any given application. A wrong can liner choice can be expensive not only to buy but also to fix when they fail. Can liners are one of the most used disposables in almost any business just only second behind toilet paper and paper towels. Understanding can liners is worth the time investment because in the end you will be able to choose the right size liner, in the right gauge, in the right resin format for the right trash can that meets the use application of your business. The right choice results in a cost savings and improves your bottom line.

CHOOSING THE RIGHT CAN LINER
This tutorial covers the following key points of consideration when choosing the right can liner:

- The right size liner for the trash can, box or bin
- The right type of resin – high or low density
- The right bag seal
- The right thickness or gauge
- The right color
- What is a "Green" or compostable liner?
- The right pack size and style of a can liner

CHOOSING THE RIGHT BAG SIZE
Bags should fit snug around upper rim of can and the bottom of the bag should nest flat at the bottom of the trash can

- Excess overhang or too much bag at the bottom of a trash can costs money
- To find the right size bag for the trash can or receptacle that is being used, see the chart below.

WHICH CAN LINER RESIN – HIGH DENSITY OR LOW DENSITY?

HIGH DENSITY – can liners are used in soft trash applications. Example – office desk trash or bathroom paper towels and tissue. High density is gauged (thickness) in metric measurements or "Microns". High density is less expensive than low density but it's dense molecular structure causes it to zipper when torn so it's ideal to use in applications that have lightweight trash. Less resin is used in high density liners making it a better choice for not only plastic consumption but our landfills.

LOW DENSITY – can liners are used in heavy trash applications. Example – heavy duty construction or kitchen waste trash. Low density is gauged in standard weights and measurements or in "Mils". A Mil measurement is thousandths of an inch. For example, a .55 mil bag would be .0055 of an inch thick. Low density is more expensive than high density can liners but they stretch and don't zipper when torn so they can take a heavy amount of pressure without compromising performance.

55 Gallon Container | 44 Gallon Container | 32 Gallon Container | 23 Gallon Slim Jim

TRASH APPLICATIONS

LINEAR LOW DENSITY POLYETHYLENE (LLDPE)

(Guaged in mils and typically extruded into flat or star seals)

Ideal can liner for heavy duty trash applications like:

- Broken glass
- Bones
- Wet, sauces, food scraps
- Broken ceramic dinnerware
- Heavy kitchen waste
- Leaves
- Construction cleanup

PROS	CONS
Stretches	More Expensive
Durable	Not impervious to odors

HIGH DENSITY POLYETHYLENE (HDPE)

(Guaged in Microns and typically extruded into star seals)

Ideal can liner for light weight trash applications like:

- Paper
- Tissue
- Office administrative trash
- Bathroom paper towels
- Lightweight paperboard and plastic

PROS	CONS
Less expensive	Zippers
Impervious to odors	Does not stretch

CAN THE BOTTOM SEAL OF A CAN LINER MAKE A DIFFERENCE IN A BAG'S PERFORMANCE?

Yes a bottom seal can make a big difference in a bag's performance as noted below.

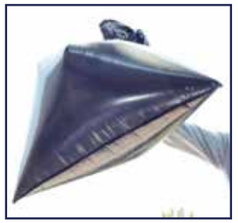
GUSSETED SEAL

The bag has a third dimension with a flat bottom. The bag is sealed at the bottom and at the corners. Although this seal allows for a pleated bottom, which might be beneficial in some circumstances, it is the weakest of the three can liner seals.

Application – a gusseted bottom is typically used as a box liner or for retail shipping applications.

FLAT SEAL

A two dimensional bag that is simply sealed at the bottom of the bag as flat.



Application – a flat seal is one of two common bottom seals used on traditional can liners. A bottom seal is very strong, displaces the weight evenly at the bottom of the bag without any weak spots.

STAR SEAL

The bottom of the bag is pulled together and pinched sealed so that when it opens back up the bottom seal of the bag looks like a star.

Application – the star seal is the strongest of the three seals. The bottom area of the star displaces the weight evenly, allowing the bag to be pulled up, out of a can, without any risk of weak spots reducing leakage.

CHOOSING THE RIGHT BAG GAUGE

Most people choose too thick of a bag for their trash. Most don't know that a slightly thinner bag will still perform the same and meet their trash application requirements. Today's resins are strong and withstand more weight and pressure than bags from years ago.

Example – 40x46 1.5 mil Black...could most likely be down gauged to a 40x46 1.2 Black and still perform without much compromise to performance.

The cost savings can be significant which could help improve your overall cost.

CHOOSING THE RIGHT COLOR

Most people may not care what color their trash bags are but it actually is one of the key points of consideration when choosing a can liner. Can liner manufacturers make a variety of can liner colors: clear, black, brown, red, white, blue, green, yellow and orange are usually the primary choices. However, the color of a can liner typically means something to your local waste company. For example:

- **GREEN** can liners usually indicate that the contents on the inside are "Green" or compostable so the waste company will direct this bag to their compost yard. If the bag is a certified compostable bag then it will typically have "Compostable" printed on the outside of the bag. Only biodegradable materials should be inserted into a compostable bag.
- **RED** can liners are typically used only for "Hazardous Waste". Hospitals or chemical manufacturers will use these types of bags because they are picked up by a special "Hazardous Waste" agency and delivered to a waste disposal and storage yard.
- **BLUE/YELLOW** can liners are typically used in hospitals to collect soiled linens from patient rooms. This is again a special type of collection that is delivered to a cleaning company who washes the linens for healthcare applications.
- **ORANGE** can liners are typically used by government transportation agencies for roadside collection and or construction.

The other colors are white, black and clear. These are the most used colors for can liners because they don't have a dedicated application. White is often used in retail trash bags sold in supermarkets. Black is a general use color and is the most highly used color of all can liners. Although black bags have a minimum of 35% recycled content, it's not enough to compromise the performance of the bag. Too much recycled content can make a can liner weak and will compromise performance.

HELPFUL FORMULAS

MILS VS. MICRONS

- Mil – A unit of measurement in thousandths of an inch. (i.e., .001 = one thousandth of an inch or 1.0 mil). Generally used to designate the thickness of LLDPE products. Mic – Short for micron, one thousandth of a millimeter. Generally used to designate the thickness of HDPE products.

FOR THE EXACT CONVERSION:

- Mils to Microns: (Number of Mils) x 25.4 (i.e., .75 mil = 19 microns).
- Microns to Mils: (Number of Microns) / 25.4 (i.e., 14 microns = .55 mil).

For the APPROXIMATE strength equivalents:

LLDPE & BLENDS	HDPE
.4 - .45 mil	6 micron
.6 - .75 mil	8 - 10 micron
.75 - .95 mil	10 - 13 micron
.95 - 1.1 mil	13 - 16 micron
1.1 - 1.5 mil	16 - 18 micron
1.5 - 1.8 mil	16 - 25 micron
Premium Super-Hexene equivalent	no comparable

Formulas for determining mil thickness, case weights, and sizing:

- LLDPE Net Case Weight (W x L x Mil) / 15 = Lbs per 1000 (i.e., 24 x 23 x .4 / 15 = 14.7 Lbs/M)
- HDPE Net Case Weight (W x L x Mic) / 25.4 / 14.7 = Lbs per 1000 (i.e., 24 x 24 x 6 / 25.4 / 14.7 = 9.2 Lbs/M)
- Pounds to Grams: Number of Lbs x 454
- Ounces to Grams: Number of Ounces / 16 x 454
- Computing average gauge from an individual bag: Gauge = Bag Weight x 30.5 / Width / Length / Density (in grams) (.92 for LL) (.95 for HD)
- Computing average gauge from a case of bags: Gauge = Net Case Weight x 13,840 / Width / Length / Density (in lbs) (.92 for LL) (.95 for HD)
- Computing case weight from weight of one bag: Case Weight = Bag Weight x Case Count / 454 (in lbs) (grams)
- Measuring instructions to determine the proper size bag for any receptacle:

For a round receptacle: Width of bag required = Diameter of receptacle x 3.14 / 2 (Diameter = the distance across the top of the receptacle) Length of bag required = 1/2 of the diameter + height of receptacle + 4" to 6" for overhang

For a square or rectangle receptacle: Width of bag required = Length of two sides Length of bag required = 1/2 the smallest side + height of receptacle + 4" to 6" for overhang

Clear can liners come in two grades: Standard clear (which may have some recycled clear resin blended inside) – used for basic everyday trash. Some restaurants like to use clear trash bags, rather than black, because they will monitor what is placed inside of the bags. The second grade is 100% virgin clear can liners. This means that the resin has no recycled content inside which allows the bag to be used in food applications.

WHAT IS A "GREEN" OR COMPOSTABLE LINER?

Due to recent regulation changes in many states some cities and counties now require a minimum amount of waste from business to now be either recyclable or compostable. Compostable resin is not petroleum based like every day can liners. In the foodservice industry restaurants are trying to reduce their trash waste by using compostable liners to deposit their food waste. Only Companies that use Certified compostable resin from BPI (Biodegradable Product Institute) meeting the ASTM -D6400 standard are recognized as compostable. Republic bag manufacturers a brand called "Code Green" that is green in color and has the certification printed on the outside of each bag. This helps restaurants identify the right bag to use for their green waste. Once a local "Green" waste route carrier picks up the "Code Green" bags as they are sent to a commercial compost facility.

CHOOSING THE RIGHT CASE PACK AND STYLE OF BAG

The last of the choices is the case pack size and the style of the bag. If you have limited storage in your business then a large case of can liners might not make sense for your operation. Can liner manufacturers can package can liners in small cases, where all of the bags might be on one roll, or

packed in larger numbers in bulkier cases.

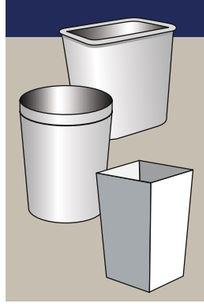
They also make different styles of bags in how they are dispensed. Some can liners are packed flat in a case and dispense out one at a time and other styles of liners come on convenient coreless rolls. Here are some helpful hints when considering the right pack size and style of liner:

- How much storage is available?
- What is the budget for can liners?
- How many liners are used in a month?
- Security – Liners that are clear are used in high security areas to avoid property theft.
- Flat pack – Large flat box dispensing liners one at a time.
- Coreless Rolls – Take up less space and work great on maid carts or can be handed out in rolls for projects. The following is a table of some of the more popular waste receptacles available on the market along with common size and liner used with each. Find the container that matches yours and note the liner size. Then choose the correct size liner in the strength you need.

ICE BUCKET

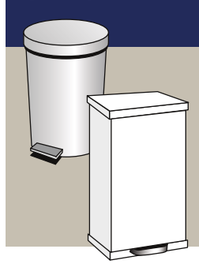
Size	Liner
3 quart	8 x 4 x 12

WASTE BASKETS



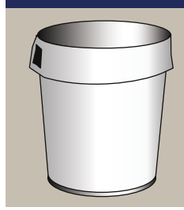
Size	Liner
4	17 x 17
7	20 x 21
7 - 10	24 x 24
10 - 15	24 x 32
12 - 16	30 x 36
33	33 x 39
40 - 45	40 x 46

STEP-ON



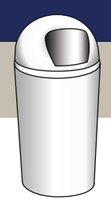
Size	Liner
4	17 x 17
7	20 x 21
7 - 10	24 x 24
12 - 16	24 x 32
20 - 30	30 x 36
60	36 x 58

ROUND BRUTE / HUSKY



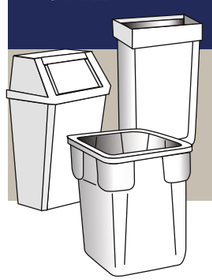
Size	Liner
12 - 16	24 x 32
20 - 30	30 x 36
33	33 x 39
40 - 45	40 x 46

ROUND TOP



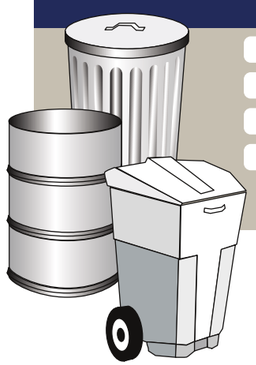
Size	Liner
33	33 x 39

SQUARE



Size	Liner
23	29 x 45
40 - 45	40 x 46
56	43 x 47

OUTDOOR



Size	Liner
33	33 x 39
40 - 45	40 x 46
55	36 x 58
60	38 x 58

WASTE RECEPTACLES

The world generates a lot of trash. Trash cans come in many shapes, sizes and materials. They can be stationery or mobile with wheels attached or placed on dollies both single and tandem.

The most common cans are injection molded plastic. This is manufactured by a gas or liquid injected into the mold to force the heated resin into the desired shape. Most office trash cans are made this way.

Structural foam is another version of injected molded designed for larger items and has more strength to weigh ratio.

Rotational molded cans are made with the resin centrifugally forced to move the heated resin throughout the mold. This has less stress on the resin and allows for thicker wall structure. The resin can use UV inhibitors to resist fading and can withstand more temperature extremes than injection molded cans. This is the most durable of construction methods.

Metal cans- These are popular for higher end establishments. Polished Stainless steel is the most popular, but powder coated and galvanized steel are also used.

All manufacturing methods can utilize removable lids, fixed lids, step on pedals or even automatic sensors for hands free use. There are some standardized colors for industry use such as blue for recycling, green for composting and red for biohazard medical waste.

The industry is looking for ways to improve worker safety and waste movement is no exception. Now hydraulic lifters can lift trash cans and tilt trucks to empty the contents without worker fatigue, injury or spillage. In return worker comp claims are reduced and employee productivity and safety are enhanced.

COMMERCIAL CLEANING CONTRACTORS

In the commercial cleaning industry there are a variety of different types of companies that can be hired to clean a home, a stadium, a business office or even a manufacturing plant. The different classifications of commercial cleaning companies are as follows:

- **MAID SERVICES**
  Maid Services are typically used for domestic in-home cleaning needs, VRBOs or even for small office buildings. Maid Services use a variety of cleaning agents, mops, dusters, vacuums and scouring products but typically do not have large cleaning equipment for industrial strength jobs.

- **BUILDING SERVICE CONTRACTORS**
  Building Service Contractors are used for larger office spaces and buildings where vast areas of carpet, hard wood or marble floors must be cleaned. Building Service Contractors or BSC's typically sign contracts with companies to clean on a daily basis where cubicles, walls, lobbies and especially bathrooms are cleaned and disinfected for ongoing public use. BSC's employ a large staff and use large industrial vacuums, floor cleaning equipment and disinfectant machines that can cover a broad scale of area within a short period of time.

- **JANITORIAL MAINTENANCE AND CLEANING SERVICES**
  Janitorial maintenance and cleaning services can be broken down to 'in-house' or 'out-sourced'. In house are typically employed in the education-municipal and health care markets. Outsourced are typically property management, airports and public arenas. They may be onsite 24 hours a day and can be employees or 1099 contractors.

- **RESTORATIVE (FIRE AND FLOOD) SERVICES**
  Restorative (Fire and Flood) Services are more of a specialty service company that is only hired if someone's home or offices are either flooded or burned by a fire. Restorative Services specialize in restoring a home or a business back to it's original condition by using special types of cleaning agents and equipment that eradicate mildew, smoke and moisture from the damaged environments.

Commercial cleaning contractors known as BSC's use a wide variety of cleaning methods, chemicals, and equipment to facilitate and expedite the cleaning process. In today's workplace their scope could include everything in the building, from floors to ceilings or just a specialized task. These specialized tasks may include carpet cleaning, stripping and refinishing floors, window cleaning, new construction cleanup, pressure washing and gum or graffiti removal. BSC's require high productivity methods and continually search out new tools and equipment to achieve this goal. Carpet cleaning though, even with regular vacuuming, needs hot water extraction applied every 18 to 24 months. External cleaning, litter picking, and removal of graffiti may also be incorporated.

EMPLOYEE PRODUCTIVITY

Employee productivity, efficiency and profitability have always been the foundations of business. Business owners and managers are always looking for the key to improving employee performance. One of the best ways to do this is to provide your employees with a clean and efficiently laid out office environment. A clean office increases productivity by reducing employee sick days and improving the overall morale of the people who work there every day. Office cleaning by a professional cleaning company reduces surface viruses and bacteria found on equipment, ledges, bathrooms and office desks. In order to keep morale high, which is directly linked to productivity, use a professional office cleaning team who understands the best techniques to prevent cross-contamination and promote true cleanliness. Some of the key steps that can be taken to clean and enhance a workspace or office are:

IMPROVE AIR QUALITY
Begin by using extension poles for dusting up high inside of the office which will remove dust that can now be sucked up by a vacuum. Then by using industrial strength vacuums that can suck up dust, dust mites and microbial bacteria in carpets and flooring. By doing this simple step your workforce will notice a dramatic improvement in the air quality in the office. A second step that can be taken to improve air quality would be to clean your HVAC ducts and install HEPA air filtration systems for cleaner better air flowing into your offices.

1 SOURCE: 3ACLEAN.COM

POWER WASHING
In many large office buildings there are outside patios and walkways as well as garages. If these areas are dirty the employees will bring the germs and dirt into the offices from the outside. Power washing can remove small stubborn germs, bugs, dirt and bacteria that can attach themselves to shoes that ride on into an office building.

WINDOW WASHING
In most offices there are typically windows around the perimeter of the offices. Some conference rooms may also be enclosed in glass, as well as entry doors and mirrors. Bacteria and mildew can multiply on glass just as fast as it can on any surface and so a clean window or glass surface is yet another step in completing the cleanliness initiative.

INSTALL SPECIALIZED FLOORING
By installing specialized flooring like tile, VCT, low rise carpet and hardwood allows janitors to clean easier than thick carpet or rough surfaces.

Productivity is also increased through better efficiency. A clean office allows employees to breath and work in a clean and fresh environment that will motivate them to be more productive and efficient.[1]

GUIDANCE FOR CLEANING AND DISINFECTING

This following information is intended for everyone, whether you own a business, run a school, or want to ensure the cleanliness and safety of your home. Reopening America requires all of us to move forward together by practicing social distancing and other daily habits to reduce our risk of exposure to the virus that causes COVID-19. Reopening the country also strongly relies on public health strategies, including increased testing of people for the virus, social distancing, isolation, and keeping track of how someone infected might have infected other people. This plan is part of the larger United States Government plan and focuses on cleaning and disinfecting public spaces, workplaces, businesses, schools, and can also be applied to your home.

This document provides a general framework for cleaning and disinfection practices. The framework is based on doing the following:

1. Before cleaning use proper PPE.
2. Normal routine cleaning with neutral or all purpose cleaners will decrease how much of the virus is on surfaces and objects. The lower the count the lower the risk of exposure.
3. Disinfection using EPA-approved disinfectants against COVID-19 can also help reduce the risk. Frequent disinfection of surfaces and objects touched by multiple people is important.
4. When EPA-approved disinfectants are not available, alternative disinfectants can be used (for example, 1/3 cup of bleach added to 1 gallon of water, or 70% alcohol solutions). Do not mix bleach or other cleaning and disinfection products together--this can cause fumes that may be very dangerous to breathe in. Keep all disinfectants out of the reach of children.

Links to specific recommendations for many public spaces that use this framework, can be found at the end of this document.

It's important to continue to follow federal, state, tribal, territorial, and local guidance for reopening America.

A Few Important Reminders about Coronaviruses and Reducing the Risk of Exposure:

- Coronaviruses on surfaces and objects naturally die within hours to days. Warmer temperatures and exposure to sunlight will reduce the time the virus survives on surfaces and objects.
- Normal routine cleaning with soap and water removes germs and dirt from surfaces. It lowers the risk of spreading COVID-19 infection.
- Disinfectants kill germs on surfaces. By killing germs on a surface after cleaning, you can further lower the risk of spreading infection. EPA-approved disinfectants are an important part of reducing the risk of exposure to COVID-19.
- Store and use disinfectants in a responsible and appropriate manner according to the label. Do not mix bleach or other cleaning and disinfection products together--this can cause fumes that may be very dangerous to breathe in. Keep all disinfectants out of the reach of children.
- Do not overuse or stockpile disinfectants or other supplies. This can result in shortages of appropriate products for others to use in critical situations.
- Always wear gloves appropriate for the chemicals being used when you are cleaning and disinfecting. Additional personal protective equipment (PPE) may be needed based on setting and product. For more information, see CDC's website on Cleaning and Disinfection for Community Facilities.
- Practice social distancing, wear facial coverings, and follow proper prevention hygiene, such as washing your hands frequently and using alcohol-based (at least 60% alcohol) hand sanitizer when soap and water are not available.

DEVELOP YOUR PLAN

Evaluate your workplace, school, home, or business to determine what kinds of surfaces and materials make up that area. Most surfaces and objects will just need normal routine cleaning. Frequently touched surfaces and objects like light switches and doorknobs will need to be cleaned and then disinfected to further reduce the risk of germs on surfaces and objects.

- First, clean the surface or object with soap and water.
- Then, disinfect using an EPA-approved disinfectant.
- Coronavirus is transmitted in the air more than surface contamination. Therefore, both are important to disinfect or at a minimum filter the air as much as possible.

You should also consider what items can be moved or removed completely to reduce frequent handling or contact from multiple people. Soft and porous materials, such as area rugs and seating, may be removed or stored to reduce the challenges with cleaning and disinfecting them. Find additional reopening guidance for cleaning and disinfecting in the Reopening Decision Tool.

It is critical that your plan includes how to maintain a cleaning and disinfecting strategy after reopening. Develop a flexible plan with your staff or family, adjusting the plan as federal, state, tribal, territorial, or local guidance is updated and if your specific circumstances change.

DETERMINE WHAT NEEDS TO BE CLEANED

Some surfaces only need to be cleaned with soap and water. For example, surfaces and objects that are not frequently touched should be cleaned and do not require additional disinfection. Additionally, disinfectants should typically not be applied on items used by children, especially any items that children might put in their mouths. Many disinfectants are toxic when swallowed. In a household setting, cleaning toys and other items used by children with soap and water is usually sufficient. Find more information on cleaning and disinfection toys and other surfaces in the childcare program setting at CDC's Guidance for Childcare Programs that Remain Open.

These questions will help you decide which surfaces and objects will need normal routine cleaning.

IS THE AREA OUTDOORS?

Outdoor areas generally require normal routine cleaning and do not require disinfection. Spraying disinfectant on sidewalks and in parks is not an efficient use of disinfectant supplies and has not been proven to reduce the risk of COVID-19 to the public. You should maintain existing cleaning and hygiene practices for outdoor areas.

The targeted use of disinfectants can be done effectively, efficiently and safely on outdoor hard surfaces and objects frequently touched by multiple people. Certain outdoor areas and facilities, such as bars and restaurants, may have additional requirements. More information can be found on CDC's website on Food Safety and the Coronavirus Disease 2019 (COVID-19).

There is no evidence that the virus that causes COVID-19 can spread directly to humans from water in pools, hot tubs or spas, or water play areas. Proper operation, maintenance, and disinfection (for example, with chlorine or bromine) of pools, hot tubs or spas, and water playgrounds should kill the virus that causes COVID-19. However, there are additional concerns with outdoor areas that may be maintained less

frequently, including playgrounds, or other facilities located within local, state, or national parks. For more information, visit CDC's website on Visiting Parks & Recreational Facilities.

HAS THE AREA BEEN UNOCCUPIED FOR THE LAST 7 DAYS?

If your workplace, school, or business has been unoccupied for 7 days or more, it will only need your normal routine cleaning to reopen the area. This is because the virus that causes COVID-19 has not been shown to survive on surfaces longer than this time.

There are many public health considerations, not just COVID-19 related, when reopening public buildings and spaces that have been closed for extended periods. For example, take measures to ensure the safety of your building water system. It is not necessary to clean ventilation systems, other than routine maintenance, as part of reducing risk of coronaviruses. For healthcare facilities, additional guidance is provided on CDC's Guidelines for Environmental Infection Control in Health-Care Facilities.

ARE YOU CLEANING OR DISINFECTING A HARD AND NON-POROUS MATERIAL OR ITEM LIKE GLASS, METAL, OR PLASTIC?

Consult EPA's list of approved products for use against COVID-19. This list will help you determine the most appropriate disinfectant for the surface or object. You can use diluted household bleach solutions if appropriate for the surface. Pay special attention to the personal protective equipment (PPE) that may be needed to safely apply the disinfectant and the manufacturer's recommendations concerning any additional hazards. Keep all disinfectants out of the reach of children. Please visit CDC's website on How to Clean and Disinfect for additional details and warnings.

Examples of frequently touched surfaces and objects that will need routine disinfection following reopening are:

- tables,
- doorknobs,
- light switches,
- countertops,
- handles,
- desks,
- phones,
- keyboards,
- toilets,
- faucets and sinks,
- gas pump handles,
- touch screens, and
- ATM machines.

Each business or facility will have different surfaces and objects that are frequently touched by multiple people. Appropriately disinfect these surfaces and objects. For example, transit stations have specific guidance for application of cleaning and disinfection.

ARE YOU CLEANING OR DISINFECTING A SOFT AND POROUS MATERIAL OR ITEMS LIKE CARPET, RUGS, OR SEATING IN AREAS?

Soft and porous materials are generally not as easy to disinfect as hard and non-porous surfaces. EPA has listed a limited number of products approved for disinfection for use on soft and porous materials. Soft and porous materials that are not frequently touched should only be cleaned or laundered, following the directions on the item's label, using the warmest appropriate water setting. Find more information on CDC's website on Cleaning and Disinfecting Your Facility for developing strategies for dealing with soft and porous materials.

MAINTAIN SAFE BEHAVIORAL PRACTICES

We have all had to make significant behavioral changes to reduce the spread of COVID-19. To reopen America, we will need to continue these practices:

- social distancing (specifically, staying 6 feet away from others when you must go into a shared space)
- frequently washing hands or use alcohol-based (at least 60% alcohol) hand sanitizer when soap and water are not available
- wearing recommended face coverings
- avoiding touching eyes, nose, and mouth
- staying home when sick
- cleaning and disinfecting frequently touched objects and surfaces

It's important to continue to follow federal, state, tribal, territorial, and local guidance for reopening America. Check this resource for updates on COVID-19. This will help you change your plan when situations are updated.[1]

1 SOURCE coronavirus.gov

INDUSTRY TERMINOLOGY AND ASSOCIATIONS

The Jan/San industry is quickly becoming one of the largest industries in North America. In 2019 the aggregate of all retail and wholesale janitorial cleaning products and equipment totaled $26.02 billion dollars which is a 1.4% growth from 2016 numbers. The advent of the COVID-19 or Corona virus has lit a panic fire under most people who have become more sensitive to the fact that germs lead to disease which can lead to death. This guide covered a multitude of different types of germs, bacteria, dust and viruses that have to be dealt with every day with some type of cleaning product and chemical. The janitorial and sanitation industry has grown exponentially over the years with hundreds of new distributors, retailers and manufacturers that have evolved with new and innovative products that have raised the bar on kill rate efficacy on these harmful germs and viruses. To fully understand how the jan/san industry works it's important to know and understand the complete chain of supply as well as the most popular associations that together create the jan/san industry that cleans our world every day.

MANUFACTURERS
are the companies that design, innovate cleaning products and produce them in their factories around the world.

SALESFORCE
can be either direct employees of the manufacturer or are seasoned and very experienced veteran brokers who represent the manufacturer and market their products to redistributors and distributors.

REDISTRIBUTION
are wholesale distribution companies that buy in large quantities and resell the manufacturers products to other distributors who are unable to meet the minimum order quantities of different manufacturers.

DISTRIBUTOR
are large warehousing and logistics companies who buy from redistributors and directly from manufacturers and resell the products in mixed loads to a variety of small retailers or businesses like restaurants, schools and hospitals.

RETAILERS / CASH & CARRY STORES
are small store front shops that display manufacturer products on their shelves and sell to the general public.

BUSINESSES / PUBLIC MUNICIPALITIES
are independent small businesses like restaurants and schools and hospitals that buy from distributors and use the manufacturers products to help drive their own businesses or public municipalities.

CONSUMERS
are the ultimate users of the manufacturers products and have the greatest power of all because they vote with their dollars and what they choose to spend those dollars on can change the entire supply pipeline described above.

OPERATORS
are large facilities that all business's want to sell product to.These are entities like airports, convention centers, casinos/resorts, hospitals and higher education campuses.

In addition to the pipeline of supply there are a few associations that also help educate and train manufacturers, brokers, distributors and even the consumer with their ongoing research efforts towards advanced cleaning technologies and helping businesses towards achieving LEED certifications. Associations like: ISSA, SCSSA, MRA, and even the NRA.

ISSA
stands for International Sanitary Supply Association and is by far the largest of the cleaning associations that offers the most to its members worldwide. www.issa.org

MRA
stands for Manufacturer Representative Association and is the single largest broker rep agency in the United States. It offers educational tools through it's sister organization called CPMR or "Certified Professional Manufacturer Representatives" who offer a three year rep training certification. Many of the members of the MRA are Jan/San brokers and represent a vast number of different types of manufacturers. www.mra.org

SCSSA
stands for the Southern California Sanitary Supply Association and it is a branch of the ISSA that hosts a trade show in Southern California each year and offers educational tools to its members. www.scssa.org

NRA
stands for the National Restaurant Association and is the single largest restaurant trade association in the world. Although its centered around primarily food it also has a great deal to offer from its members on cleaning products, chemicals and equipment.

CONCLUSION

This guide was written to provide a better understanding of the microbial environment that surrounds us with the goal of educating the reader on all of the different types of germs, dirt, dust, molds, mildew and viruses that can shut down not only a global economy but it can shut down human life as well. There are many different types of diseases and bacterias that we all need to be better aware of in order to help us all make better decisions about how we clean, what we clean with or who we can call to help us clean better than we have in the past. COVID-19 was and still is today a worldwide threat to human life and to global economies and so it has been a lesson to us all in how thorough cleaning, sanitizing and disinfecting can prevent the spread of deadly viruses. It takes the right chemicals, the right cleaning equipment and the proper techniques to sustain a clean, fresh office space environment that allows people to remain healthy at work, rather than become sick from poor conditions, and keeps them highly efficient and productive every day. If you don't feel 100% confident that your work office environment is being properly cleaned, sanitized and disinfected from every day dirt, dust and bacteria then feel free to call the experts at Nexus. We are here to help!

Thank You

800.482.6088

www.nexus-now.com

CONTACT US

T 800.482.6088

F 510.567.1005

www.nexus-now.com

NORTHERN CALIFORNIA CORPORATE OFFICES

7042 Commerce Circle, Suite B
Pleasanton, CA 94588
ph: 800.482.6088
fax: 510.567.1005

SOUTHERN CALIFORNIA SALES OFFICE

20992 Bake Pkwy., Suite 100
Lake Forest, CA 92630
ph: 800.482.6088

SEATTLE WASHINGTON SALES OFFICE

1044 Industry Drive, Bldg. 34
Tukwila, WA 98188
ph: 800.482.6088

SCAN TO VIEW PDF

PHOENIX ARIZONA SALES OFFICE

3637 West Roanoke, Suite 1-2
Phoenix, AZ 85009
ph: 800.482.6088