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Sanitizers vs. Disinfectants

A closer look at sanitizers and disinfectants

what they are · where they are used · differences

Germ killing products are used in food service and health care. Although the germs (bacteria, fungi and viruses) are too small to see unless under a microscope, these microorganisms can cause serious or fatal diseases. Protecting consumers from foodborne illness is one of the primary responsibilities of the Food Service Industry (FSI), while the Health Care and Hospitality Industries (HCHI) wage an ongoing war against germs in hotel, resident, operating, and patients' rooms. While the goal of killing germs is the same, the weapons used are different. Food Service professionals use products called sanitizers, while HCHI professionals use disinfectants. In this brochure, we will demonstrate where and how each of these products are used. First, some definitions:

Sanitizer - An agent that reduces the number of disease causing (pathogenic) bacteria on an inanimate food contact surface to safe levels as judged by public health requirements. A sanitizer generally is a chemical that kills 99.999% of specific test bacteria in a specified amount of time.

Disinfectant - An agent that frees an inanimate body (generally hard nonporous surfaces) from infection by destroying microorganisms. Disinfectants kill 100% of certain microorganisms, but they are not used on people, only inanimate surfaces. Because disinfectants do not kill all microorganisms, especially bacterial spores, they are different from sterillants.

Sterillant - A sterillant kills all microorganisms, regardless of type, including spores. Sterillants are not cleaning products and are sold by medical supply houses, not cleaning product companies like U S Chemical.

These definitions only give a part of the story. The difference between sanitizers and disinfectants is more than the 0.001% difference in the kill rates.

WHERE ARE THEY USED

Sanitizers are used on any surface that might contact food. This includes: food preparation counter tops, plates, glasses, flatware, food preparation equipment (kettles, steamers), utensils, pots, pans, trays, and baking sheets. Sanitizers are also used in machines, like low temperature dishmachines and bar glass washers.

Disinfectants are applied to floors, walls, toilets, bed frames, sinks, showers, bathtubs, chairs, ceilings and whirlpools. Sanitizers are only used on food contact surfaces.

Disinfectants are generally not used on food contact surfaces, unless they have specific labeling instructions to be used as a sanitizer. When this happens, the disinfectant will have one use-dilution as a disinfectant and a different use-dilution as a sanitizer.

Sanitizers used in dishmachines and bar glass washers have different rules regarding the contact times, chemicals allowed, and the concentration of the chemicals used. Some dishmachines, called high temperature dishmachines, use 180+°F hot water for sanitizing. These dishmachines are not discussed here.

CONTACT TIME

Chemical sanitizers must contact the surface for a minimum of one minute when used in such applications as three tank sinks, clean-in-place (CIP) systems, and hard surface sanitizing. Again, sanitizers used in dishmachines or bar glass washers have different requirements. When disinfectants are used, the surface must stay wet for a minimum of ten minutes unless otherwise listed on the label.

SCENT

Sanitizers cannot have artificial scents added. Sanitizers are applied to food contact surfaces thus there can be no residual that might give an off flavor to food. Disinfectants are not applied to food surfaces, so they often have lemon, pine, floral, herbal or other scents added to them to leave a fresh scent after the disinfection. If a disinfectant is labeled to be used also as a sanitizer, it will be unscented.

CHEMICALS USED

Disinfectants are made from quaternary ammonium compounds (quats), chlorine (sodium hypochorite bleach), accelerated Hydrogen Peroxide (AHP) or phenolics. Sanitizers are chlorine, quats, iodine and acid-anionics. Iodine sanitizers are actually a chemical compound of a surfactant and the iodine. This blend is often called an iodophor. Acidanionics are a combination of phosphoric acid and an anionic surfactant. Surfactants are chemicals that foam and have detergency.

CONCENTRATION OF CHEMICAL USED

Sanitizers are used at much lower concentrations than the concentrations used for disinfectants. As an example, quaternary ammonium compounds are used at 200 ppm as sanitizers, but anywhere from 600 to 2100 ppm as disinfectants. Where sanitizers are used at low concentrations to avoid leaving a residue that could be harmful to people or food, disinfectants are used at concentrations that will leave

a potentially dangerous residue because the primary concern is germ killing, not food safety.

Since disinfectants are not used on food surfaces, they often have builders, surfactants (detergents) and other chemicals that aid in the cleaning process. Often disinfectants will be referred to as "disinfectant cleaners or germicidal cleaners" to help denote the presence of chemicals to aid in cleaning. For this reason, quat disinfectant cleaners should not be diluted down to 200 ppm and used as sanitizers. Not only does this violate the label instructions, it is dangerous because of the other chemicals present. Disinfectants that have a lower use-dilution and labeling for use as a sanitizer contain no cleaning chemicals that will contaminate food.

Quat based sanitizers can do a limited amount of light-duty cleaning, such as on dining room tables with negligible amounts of food soil present. If heavy soils are present, then precleaning must be done. The standard five step procedure: prescrape, wash in a suitable detergent solution, rinse in potable (tap) water, sanitize with a properly measured sanitizer solution and air dry (do not towel dry). This procedure is required by the Environmental Protection Agency (EPA) (see below).

HOW THEY ARE REGULATED

Any product that makes a claim of killing an organism is regulated by the Environmental Protection Agency (EPA) under the federal law, FIFRA, which is the Federal Insecticide, Fungicide and Rodenticide Act. The EPA regulates everything from rat poisons to pool algaecides under this law. This umbrella law has specific requirements such as the label content, use dilution, formula and manner of application. In addition, the Food And Drug Administration (FDA), United States Department of Agriculture (USDA), and each state have additional regulations that must be observed. The end result is designed to make the products work safely and effectively when used properly.

WHAT THEY KILL

Sanitizers and disinfectants may kill:

Bacteria - Self-sufficient microorganisms, usually composed of one cell, in the form of straight or curved rods (bacilli), spheres (cocci) or spiral structures. Important bacteria include: mycobacterium tuberculosis, salmonella, escherichia coli, staphylococcus aureus, clostridium botulinum, clostridium perfringens, kliebsiella pneumonia, proteus mirabilis and vulgaris, pseudomonas aeruginosa, shigella and vibrio vulnificus.

Fungi/Fungus - Sporebearing microorganisms that have a nucleus but are devoid of chlorophyll, living as parasites on plants, animals or other fungi. Important fungi include: aspergillus niger (mildew) and trichophyton mentagrophytes (athletes foot fungus).

Virus - An infectious agent composed entirely of protein and nucleic acids. Viruses can reproduce only in living cells and are so small that high powered electron microscopes are needed to see them. They are parasites relying on and living in body cells. Important viruses are: hepatitis, avian infectious bronchitis (respiratory infections), canine distemper, feline leukemia, herpes, influenza, rabies, rubella (German Measles), vaccinia (small pox) and human immunodeficiency virus (HIV).

Sanitizers are tested against salmonella typhimurium, if they are chlorine or iodine based. Quat and acid-anionic sanitizers are tested against staphylococcus aureus and E. coli. These bacteria commonly cause foodborne illness and are tough to kill. The reason why sanitizers aren't tested against more bacteria is that it is assumed that if a sanitizer kills these strong bacteria, it will kill other bacteria which are weaker. While there may be thousands of bacteria, a sanitizer needs only to be tested against these specific bacteria.

Disinfectants may be effective against bacteria, fungi and viruses. Unlike for sanitizers, which have a generic registration, disinfectants must be tested against every organism the disinfectant claims to kill. When reading a sanitizer label, no organisms are typically listed because the label claim of being a sanitizer tells you that it is for food contact surfaces and a general bacteria killer. However, disinfectants must list every organism claimed to be killed. It is a reasonable inference that disinfectants, like sanitizers, kill more organisms than those tested against or listed on the label, but EPA regulations prohibit such claims being made in writing.

The label will tell you what you need to know about the strength and quality of the disinfectant. Some disinfectants may claim to kill tuberculosis, while most do not. If you are unsure, read the label. Disinfectants will typically be tested against a broad spectrum of bacteria, fungi, and viruses, but not bacterial spores. Some bacteria can grow a hard outer shell that is very resistant to attack. These bacteria are called spores. These spores are only killed by the use of a sterillant.

KILL RATES

Sanitizers claim to kill a minimum of 99.999% of the specific test bacteria mentioned before. Disinfectants claim to kill 100% of the bacteria, fungi, and viruses listed on the label.

CONCLUSIONS

In summary, sanitizers are used on food contact surfaces at low concentrations for a one minute contact time, while disinfectants are used at higher concentrations on nonfood surfaces for a ten minute contact time. Sanitizers only claim to kill those bacteria that cause foodborne illness, while disinfectants will claim to kill a collection of bacteria, fungi and viruses. Sanitizers are found in food service, while disinfectants are found in hotels, motels, nursing homes and hospitals. Disinfectants may be used in food service, but only on nonfood surfaces, such as floors and restrooms, unless there are specific instructions and a different use dilution to use the disinfectant as a sanitizer. If there any questions or comments concerning this information, please contact the U S Chemical Training Department for further information.

The information presented herein is, to the best of our knowledge, true and accurate. It should not be assumed that the information is 100% complete, or that it will not change in the future due to conditions beyond our control. This brochure is not to supercede and Federal, state or local regulations which may be in force.