RJC COMMERCIAL JANITORIAL & CLEANROOM SOLUTIONS

SANITIZING

Sanitizing is the process of reducing the number of microorganisms that are on a properly cleaned surface to a safe level. A safe level is defined as a 99.999% reduction of the number of disease microorganisms that are of public health importance. Sanitizing is accomplished by using either heat, radiation, or chemicals. Unless the item to be sanitized is effectively cleaned, it is impossible to obtain close contact between the sanitizer and the surface to the sanitized. Also, some chemical sanitizers, such as chlorine and iodine, react with organic matter and so will be less effective when the surface is not properly cleaned.

Definitions for Sanitizing Terms

- **Antiseptic** -- an agent used against sepsis or putrefaction in connection with human beings or animals.
- **Disinfectant** -- an agent that is applied to inanimate objects; it does not necessarily kill all organisms.
- **Sanitizer** -- an agent that reduces the microbiological contamination to levels conforming to local health regulations.
- **Germicide** -- an agent that destroys microorganisms.
- **Bactericide** -- an agent that causes the death of a specific group of microorganisms.
- **Bacteriostat** -- an agent that prevents the growth of a specific group of microorganisms but does not necessarily kill them.
- **Sanitization** -- the process of reducing microbiological contamination to a level that is acceptable to local health regulations.
- **Sterilization** -- the process of destroying all microorganisms.

SANITIZING METHODS

- **Heat.** There are three methods of using heat to sanitize surfaces. The first is exposing the surface to steam using one of the following time temperature schedules -- 170 degrees F for 15 minutes or 200 degrees F for 5 minutes. A second method is hot water, which is the most common method used in food establishments. The higher the temperature, the less time that is needed to kill microorganisms. If hot water is used in the third compartment of a three-compartment sink, it must be at least 171 degrees F (77 degrees C). If high-temperature washing machine is used to sanitize cleaned dishes, the final sanitizing rinse must be at least 180 degrees F. Cleaned items must be exposed to these temperatures for at least 30 seconds. The final method of using heat is hot air that is applied at 180 degrees F for 20 minutes.
- **Radiation.** Ultraviolet radiation can be used to sanitize but is not used in most foodservice establishments. Its major application is in the packaging areas of food

processing facilities. The contact time should be at least 2 minutes. It only destroys those microorganisms that are in direct contact with the rays of light.
- **Chemicals.** The chemicals that have been proven to be effective at the proper concentration include chlorine, iodine, and quaternary ammonium.

FACTORS THAT AFFECT THE EFFICACY OF THE SANITIZING AGENT

Different factors influence the effectiveness of chemical sanitizers. The three factors that must be considered are:

- **Concentration** -- The presence of an insufficient amount of a sanitizing agent will result in an inadequate reduction of microorganisms. Too much can be toxic.
- **Temperature** -- Generally chemical sanitizers work best a temperature between 55 degrees F (13 degrees C) and 120 degrees F (49 degrees C).
- **Contact time** -- In order for the sanitizer to kill microorganisms, the cleaned item must be in contact with the sanitizer (either heat or approved chemical) for the recommended length of time.

RELATIVE MERIT OF CHEMICAL SANITIZING AGENTS

Chlorine -- 50 ppm in water between 75-100 degrees F (7 seconds)

- Advantages -- effective on a wide variety of bacteria; highly effective; not affected by hard water salts; generally inexpensive.
- Disadvantages -- corrosive, irritating to the skin, effectiveness decreases with increasing pH of solution; deteriorates during storage and when exposed to light; dissipates rapidly; loses activity in the presence of organic matter.

Iodine -- 12.5-25 ppm in water at least 75 degrees F (30 seconds)

- Advantages -- forms brown color that is indicative of the germicidal strength; not affected by hard water salts; less irritating to the skin than is chlorine; active against a wide variety of non-spore forming bacteria; and activity not lost as rapidly as chlorine in the presence of organic matter.
- Disadvantages -- bactericidal effectiveness decreases greatly with an increase in pH (most active at pH 3.0 and very low acting at pH 7.0); less effective against bacterial spores and bacteriophage than is chlorine, should not be used at temperatures greater than 120 degrees F; and may discolor equipment and surfaces.

Quaternary Ammonium Compounds -- up to 200 ppm in water at least 75 degrees F (30 seconds)

- Advantages -- nontoxic, odorless, colorless, noncorrosive, nonirritating; stable to heat and relatively stable in the presence of organic matter; active over a wide pH range; and quite active against thermoduric organisms.
- Disadvantages -- slow destruction of coliform and psychrophilic organisms; non-compatible with anionic detergents and hard water salts; and not effective against bacteriophage