

Slide 177



The information presented in this section is based on Parts 4-6 and 4-7 of the 2005 Food Code. The Food Code is available at: <http://www.cfsan.fda.gov/~dms/fc05-toc.html>

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Cleaning

Cleaning is the process of removing food and other soils.

Cleaning Agents

- Detergents
- Solvent cleaners
- Acid cleaners
- Abrasive cleaners



Cleaning and Sanitizing 178

I. CLEANING

Cleaning is the process of removing food and other types of soil from a surface, such as a dish, glass, or cutting board. Cleaning is accomplished using a cleaning agent that removes food, soil, rust stains, minerals, or other deposits. The right cleaning agent must be selected because not all can be used on food-contact surfaces. (A food-contact surface is defined as a surface of equipment or utensil with which food normally comes into contact or a surface of equipment or a utensil from which food may drain, drip, or splash into a food or onto a surface normally in contact with food.)

Definitions for Cleaning Terms

Acidity -- the degree or measure of the amount of acid in a solution or substance; measurement can be expressed in parts per million, percentage, or pounds or grains per gallon.

Acids -- they are chemicals that form hydrogen ions in solution giving a pH less than 7.

Acids, strong -- they are substances that release high concentrations of hydrogen ions in a solution giving a very low pH. Examples include muriatic and sulfuric acids.

Acids, weak -- they release moderate to low concentrations of hydrogen ions in a solution, giving a moderately low pH. Examples include organic acids, such as lactic and acetic acids.

Alkalinity -- the degree or measure of the amount of alkali in a solution or substance.

Alkalis -- they are chemicals that release an excess of hydroxyl ions in a solution giving a pH of greater than 7.

Alkalis, strong -- they are substances that release high concentrations of hydroxyl ions in solution giving a very high pH. Examples include caustic soda and caustic potash.

Alkalis, weak -- they release moderate to low concentrations of hydroxyl ions giving moderately high pH values. An example is sodium bicarbonate.

Buffer -- any material that moderates the intensity of an acid or alkali in solution without reducing the quantity of acidity or alkalinity.

Corrosion-resistant materials -- materials that are capable of maintaining their original surface characteristics under prolonged use, including the expected food contact and the normal use of cleaning compounds and sanitizing solutions.

Dispersion or deflocculation -- the action of breaking up of mass into fine particles, which are then suspended and flushed off the surface and/or equipment

Dissolving -- refers to the mixing of a liquid and a solid to produce a homogeneous solution.

Easily cleanable -- surfaces must be readily accessible and made of such materials and finish and so constructed that chemical residues may be effectively removed by the cleaning process.

Emulsification -- the action of breaking up fats and oils into very small particles which are uniformly mixed in a water solution, preventing the clumping or clustering of the particles; in a stable emulsion the oil particles are suspended for a long period of time.

Peptizing -- the physical formation of colloidal solutions from soils which may be only partially soluble; this action is similar to dispersion but is particularly applicable to protein soils.

Rinsing -- condition of a solution or suspension which enables it to be flushed from a surface easily and completely; action occurs by reducing the surface tension of the water being used.

Saponification -- a chemical reaction of esters into acids or alcohols by the action of alkalis or acids; use of alkalis with animal or vegetable fats results in soap.

Sequestration -- the chemical action resulting in the binding of a metal ion in solution with the formation of a soluble and stable complex; when the activity is performed to control water hardness with formation of a typical organic ring structure, the action is termed "chelation."

Surfactant -- a chemical product whose molecules are able to modify the properties of an interface, e.g. liquid/liquid, liquid/air by lowering (reducing) the surface tension, allowing water to contact all surfaces. The four major types of surfactants used in detergents are: anionic, cationic, nonionic, and amphoteric.

Suspension -- the action, which keeps insoluble particles uniformly distributed in a solution, preventing them from settling and forming deposits and making it easier to flush them from equipment.

Water hardness -- relates to water containing mineral constituents, which form insoluble products, resulting in poor lathering of soap; principally caused by salts of calcium, magnesium, and iron.

Water softening -- the process of removing the calcium and magnesium salts, preventing the precipitation of insoluble carbonates and hydroxides.

Types of Cleaning Agents

Not all cleaning agents can be safely used on food-contact surfaces. Examples of those that should not be used include: glass cleaners, some metal cleaners, tub, and tile cleaners. The label should indicate if the product can be used on a food-contact surface. Secondly, the ideal cleaning agent must be selected to make cleaning easy. Cleaning agents are divided into four categories:

- **Detergents** -- All detergents contain surfactants that reduce surface tensions between the soil and the surface, so the detergent can penetrate quickly and soften the soil. Examples include Dawn and Joy dishwashing detergent and automatic dishwasher detergents.
- **Solvent cleaners** -- Often called degreasers, solvent cleaners are alkaline detergents that contain a grease-dissolving agent. These cleaners work well in areas where grease has been burned on. Examples include Fantastik.

- **Acid cleaners** -- Use on mineral deposits and other soils alkaline cleaners cannot remove, these cleaners are often used to remove scale in warewashing machines and steam tables. Examples include CLR.
- **Abrasive cleaners** -- Use these cleaners to remove heavy accumulations of soil often found in small areas. Small mineral or metal particles, fine steel wool, copper, or nylon particles provide the abrasive action. Some abrasive cleaners also disinfect. Examples include Ajax and Comet.

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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 99.999% reduction of the number of disease microorganisms that are of public health importance.
- Sanitizing agents only work on properly cleaned and rinsed surfaces.

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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.

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Methods for Sanitizing

Heat

- Hot water – 170°F or 180°F
- Steam

Chemicals

- Chlorine – 50 ppm
- Quaternary Ammonia – 200 ppm
- Iodine – 12.5 ppm

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II. SANITIZING

Sanitizing is accomplished by using 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 be 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.

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 warewashing 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 at temperatures 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 thermophilic organisms.

Disadvantages -- slow destruction of coliform and psychrophilic organisms; non-compatible with anionic detergents and hard water salts; and not effective against bacteriophage

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Activity

Sanitizing Preparation

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ACTIVITY INSTRUCTIONS: The instructions for this activity can be found at:
<http://www.foodsafety.gov/resources/pdfs/foodservice/sa-solution.pdf>

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Dish machines

High temperature machines

- Final sanitizing rinse must be 180°F (82°C) or hotter
- Measure water temperature at the manifold

Chemical sanitizing machines

- Wash water 120°F (49°C) or hotter
- Rinse water 75°F (24°C) to 120°F (49°C)
- Use the recommended sanitizer
- Follow the manufacturers instructions



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During operation, warewashing equipment is subject to the accumulation of food wastes and other soils or sources of contamination. In order to ensure the proper cleaning and sanitization of equipment and utensils, it is necessary to clean the surface of warewashing equipment before use and periodically throughout the day.

Warewashing Machines, Manufacturers' Operating Instructions

To ensure properly cleaned and sanitized equipment and utensils, warewashing machines must be operated properly. The manufacturer affixes a data plate to the machine providing vital, detailed instructions about the proper operation of the machine including wash, rinse, and sanitizing cycle times and temperatures which must be achieved.

Warewashing Sinks, Use Limitation

If the wash sink is used for functions other than warewashing, such as washing wiping cloths or washing and thawing foods, contamination of equipment and utensils could occur.

Warewashing Equipment, Cleaning Agents

Failure to use detergents or cleaners in accordance with the manufacturer's label instructions could create safety concerns for the employee and consumer. For example, employees could suffer chemical burns, and chemical residues could find their way into food if detergents or cleaners are used carelessly. Equipment or utensils may not be cleaned if inappropriate or insufficient amounts of cleaners or detergents are used.

Warewashing Equipment, Clean Solutions

Failure to maintain clean wash, rinse, and sanitizing solutions adversely affects the warewashing operation. Equipment and utensils may not be sanitized, resulting in subsequent contamination of food.

Mechanical Warewashing Equipment, Wash Solution Temperature

The wash solution temperature in mechanical warewashing equipment is critical to proper operation. The chemicals used may not adequately perform their function if the temperature is too low. Therefore, the manufacturer's instructions must be followed. The temperatures vary according to the specific equipment being used.

Mechanical Warewashing Equipment, Hot Water Sanitization Temperatures

The temperature of the hot water delivered to the warewasher manifold must be maintained according to the equipment manufacturer's specification to ensure that the surfaces of utensils or tableware accumulate and build up enough heat to destroy pathogens that may be present on such surfaces. The surface temperature should reach at least 71°C (160°F) as measured by an irreversible registering temperature indicator.

Mechanical Warewashing Equipment, Sanitization Pressure

If the flow pressure of the final sanitizing rinse is less than that required, dispersion of the sanitizing solution may be inadequate to reach all surfaces of equipment or utensils.

Warewashing Equipment, Determining Chemical Sanitizer Concentration

The effectiveness of chemical sanitizers is determined primarily by the concentration and pH of the sanitizer solution. Therefore, a test kit is necessary to accurately determine the concentration of the chemical sanitizer solution.

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Three-compartment sink

1. **Wash** -- Water temperature at least 110°F (43°C)
2. **Rinse** -- Water temperature at least 110°F(43°C)
3. **Sanitize** -- Hot water temperature of 171°F (77°C) to 180°F (82°C) or chemical solution of 50 ppm
4. **Air-dry** -- Do not hand dry



Never mix chemical sanitizers with washing water detergents

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Manual Warewashing Equipment, Wash Solution Temperature

The wash solution temperature required in the Food Code is essential for removing organic matter. If the temperature is below 110°F, the performance of the detergent may be adversely affected, e.g., animal fats that may be present on the dirty dishes would not be dissolved.

Manual Warewashing Equipment, Hot Water Sanitization Temperatures

If the temperature during the hot water sanitizing step is less than 77°C (171°F), sanitization will not be achieved. As a result, pathogenic organisms may survive and be subsequently transferred from utensils to food.

Manual and Mechanical Warewashing Equipment, Chemical Sanitization - Temperature, pH, Concentration, and Hardness

The effectiveness of chemical sanitizers can be directly affected by the temperature, pH, concentration of the sanitizer solution used, and hardness of the water. All sanitizers approved for use must be used under water conditions stated on the label to ensure efficacy. Therefore, it is critical to sanitization that the sanitizers are used properly and the solutions meet the minimum standards required in the Code.

Manual Warewashing Equipment, Chemical Sanitization Using Detergent-Sanitizers

Some chemical sanitizers are not compatible with detergents when a 2-compartment operation is used. When using a sanitizer that is different from the detergent-sanitizer of the wash compartment, the sanitizer may be inhibited by carry-over, resulting in inadequate sanitization.

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Measuring Sanitizer Strength

A test kit that accurately measures the concentration of sanitizing solutions must be available.

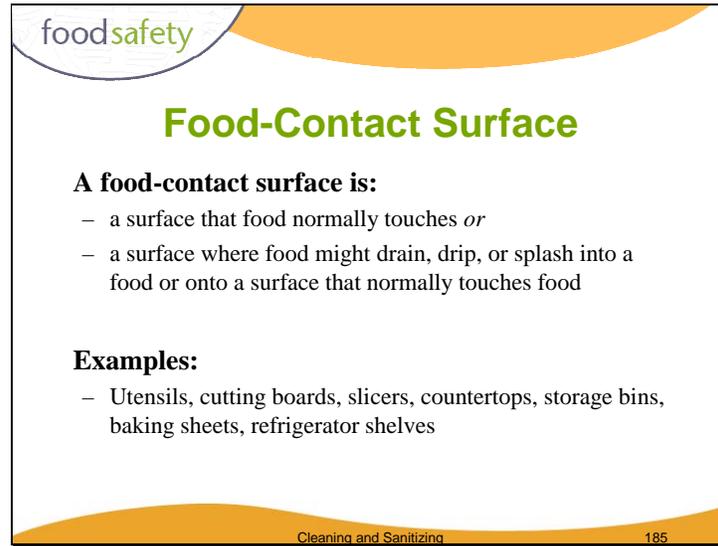


The strength of sanitizing solutions must be measured frequently during use.



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Testing devices to measure the concentration of chemical sanitizing solutions are required for two reasons: (1) the use of chemical sanitizers requires minimum concentrations of the sanitizer during the final rinse step to ensure sanitization; and (2) too much sanitizer in the final rinse water could be toxic. To accurately test the strength of a sanitizing solution, one must first determine which chemical is being used - chlorine, iodine, or quaternary ammonium. The appropriate test kit must then be used to measure concentration.



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Food-Contact Surface

A food-contact surface is:

- a surface that food normally touches *or*
- a surface where food might drain, drip, or splash into a food or onto a surface that normally touches food

Examples:

- Utensils, cutting boards, slicers, countertops, storage bins, baking sheets, refrigerator shelves

Cleaning and Sanitizing 185

Pathogens can be transferred to food from utensils that have been stored on surfaces, which have not been cleaned and sanitized. Consumers or employees may also pass them on directly, or indirectly from used tableware or food containers.

Some pathogenic microorganisms survive outside the body for considerable periods of time. Food that comes into contact directly or indirectly with surfaces that are not clean and sanitized is liable to such contamination. The handles of utensils, even if manipulated with gloved hands, are particularly susceptible to contamination.

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Cleaning Food-Contact Surfaces

Immersion

- Wash with detergent
- Rinse thoroughly
- Immerse in a properly prepared sanitizing solution.



In-place sanitizing

- Spray solution

Cleaning and Sanitizing 186

Food-contact surfaces must be cleaned with soap, rinsed, and then sanitized. A food-contact surface is defined as:

a surface of equipment or a utensil with which food normally comes into contact; or surface of equipment or a utensil from which food may drain, drip, or splash into a food or onto a surface that normally comes in contact with food.

Microorganisms may be transmitted from a food to other foods by utensils, cutting boards, thermometers, or other food-contact surfaces. Food-contact surfaces and equipment used for potentially hazardous foods should be cleaned as needed throughout the day but must be cleaned no less than every 4 hours to prevent the growth of microorganisms on those surfaces.

Refrigeration temperatures slow down the generation time of bacterial pathogens, making it unnecessary to clean every four hours. However, the time period between cleaning equipment and utensils may not exceed 24 hours.

Surfaces of utensils and equipment contacting food that is not potentially hazardous such as iced tea dispensers, carbonated beverage dispenser nozzles, beverage dispensing circuits or lines, water vending equipment, coffee bean grinders, ice makers, and ice bins must be cleaned on a routine basis to prevent the development of slime, mold, or soil residues that may contribute to an accumulation of microorganisms. Some equipment manufacturers and industry associations, e.g., within the tea industry, develop guidelines for regular cleaning and sanitizing of equipment. If the manufacturer does not provide cleaning specifications for food-contact surfaces of equipment that are not readily visible, the person in charge should develop a cleaning regimen that is based on the soil that may accumulate in those particular items of equipment.

Cooking and Baking Equipment.

Food-contact surfaces of cooking equipment must be cleaned to prevent encrustations that may impede heat transfer necessary to adequately cook food. Encrusted equipment may also serve as an insect attractant when not in use. Because of the nature of the equipment, it may not be necessary to clean cooking equipment as frequently as other equipment.

Clean in Place (CIP)

In-place sanitizing or cleaning (often referred to as CIP) means cleaned in place by the circulation or flowing by mechanical means through a piping system of a detergent solution, water rinse, and sanitizing

solution onto or over equipment surfaces that require cleaning, such as the method used, in part, to clean and sanitize a frozen dessert machine.

CIP does not include the cleaning of equipment such as band saws, slicers, or mixers that are subjected to in-place manual cleaning without the use of a CIP system.

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Cleaning Non-Food Contact Surfaces

- Non-food contact surfaces:
 - exterior of refrigerator, stovetops, and refrigerator gaskets.
- Wash with detergent and rinse but do not need to sanitize.
- Keep free of dirt, dust, and debris.



Cleaning and Sanitizing 187

The presence of food debris or dirt on nonfood contact surfaces may provide a suitable environment for the growth of microorganisms that employees may inadvertently transfer to food. If these areas are not kept clean, they may also provide harborage for insects, rodents, and other pests.

Slide 188

The slide features a decorative header with a semi-circular image of various vegetables including white rice, green peas, red bell peppers, and yellow bell peppers. The main content area is white with a black border. At the bottom, there is a wavy orange footer bar containing the text "Cleaning and Sanitizing" and the slide number "188".

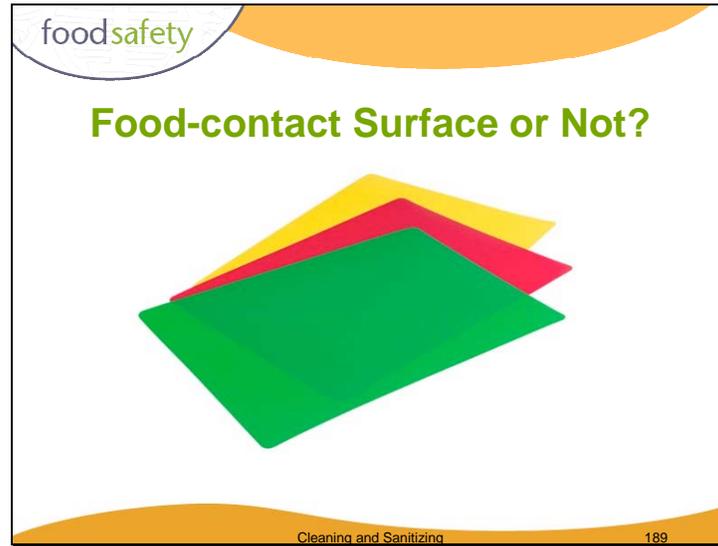
Activity

Food-contact Surface or Not?

Cleaning and Sanitizing 188

ACTIVITY INSTRUCTIONS: Have the participants review slides 189-192 and determine if the item shown is a food-contact surface or not. Emphasize that food-contact surfaces must be washed, rinsed, and sanitized after use. Non-food contact surfaces only need to be washed and rinsed.

Slide 189



Food-contact surface. Cutting boards

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Food-contact Surface or Not?



Cleaning and Sanitizing 190

The image shows a commercial-grade stand mixer with a stainless steel bowl and attachments. The mixer is mounted on a base. The bowl and mixer attachments are food-contact surfaces, while the base is a non-food-contact surface.

The bowl and mixer attachments are food-contact surfaces. The base is non-food-contact surface.

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Food-contact Surface or Not?



Cleaning and Sanitizing 191

The image shows a commercial slicer machine, likely used for slicing meats or cheeses. The machine is made of stainless steel and has a large, circular, perforated metal plate on top. The brand name 'Olix' is visible on the front panel. The machine is situated in a kitchen environment with other equipment visible in the background.

Food-contact surface. Slicer and knives

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Food-contact Surface or Not?



Cleaning and Sanitizing 192

The image shows the exterior of a stainless steel refrigerator with three doors. The doors are closed and have recessed handles. The surface is highly reflective, showing bright highlights from overhead lights. The refrigerator is set against a light-colored wall.

Not a food-contact surface. Exterior surfaces of a refrigerator

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Storing Cleaned and Sanitized Items

- In clean, dry location
- Not exposed to splash, dust, or other contamination
- At least 6 inches (15 cm) above the floor
- In a self-draining position
- Covered or inverted



Cleaning and Sanitizing 193

Clean equipment and multiuse utensils which have been cleaned and sanitized, laundered linens, and single-service and single-use articles can become contaminated before their intended use in a variety of ways such as through water leakage, pest infestation, or other unsanitary condition.

The improper storage of clean and sanitized equipment, utensils, laundered linens, and single-service and single-use articles may allow contamination before their intended use. Contamination can be caused by moisture from absorption, flooding, drippage, or splash. Food debris, toxic materials, litter, dust, and other materials can also cause it. The contamination is often related to unhygienic employee practices, unacceptable high-risk storage locations, or improper construction of storage facilities.

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Chemicals

- Improperly stored chemicals can possibly contaminate food.
- Store separate from food, equipment, utensils, linen, and single-service and single-use items.
- If removed from their original package, label the container in which they are stored.



Cleaning and Sanitizing 194

Separation of poisonous and toxic materials in accordance with the requirements of this section ensures that food, equipment, utensils, linens, and single-service and single-use articles are properly protected from contamination. For example, the storage of these types of materials directly above or adjacent to food could result in contamination of the food from spillage.



Material Safety Data Sheets

- OSHA requires a Material Safety Data Sheet (MSDS) for all chemicals.
- On every MSDS, be familiar with the following sections:
 - 4.0 Fire and explosion data
 - 5.0 Reactivity data
 - 6.0 Spill or leak procedures
 - 7.0 Health hazard data
 - 8.0 First aid
 - 9.0 Protective measures
 - 10.0 Additional information/precautions

Cleaning and Sanitizing 195

Material Safety Data Sheets (MSDS) are one way that chemical manufacturers and importers provide hazard information to users, such as foodservice workers. Chemical manufacturers and importers must develop a standard MSDS for each hazardous chemical they produce or import. The MSDS must be provided automatically when the initial shipment of a hazardous chemical is sent to a distributor or user. The MSDS can be included with the chemical shipment or under separate cover.

The manufacturer evaluates each chemical for its potential to cause adverse health effects and/or physical hazards. Examples of possible hazards are:

Physical Health Hazards Chemically reactive and so unstable

Toxic (poisonous)

Compressed gases

Carcinogenic (causes cancer)

Explosive

Reproductive toxins (causes birth defects)

Flammable

Irritants

Organic peroxide

Sanitizers

Pyrophoric (ignites in air at less than 130°F)

Corrosive (strong acid or alkali)

Water-reactive (releases flammable or hazardous gases when mixed with water)

Agents that damage skin, eyes, lungs or mucous membranes

No specific MSDS form is required as long as it includes following information: physical and chemical characteristics of the material; known acute and chronic health effects; exposure limits; special handling or use instructions; protective equipment or procedures; emergency and first-aid steps; and the identity of the organization that prepared the MSDS. The form must be prepared in English and include both common names and the specific chemical identity of the product. An example of how many MSDSs are presented is below.

Section Information Specifics

1. Contact information -- Manufacturer name, address, emergency telephone number, telephone number for information, and date prepared

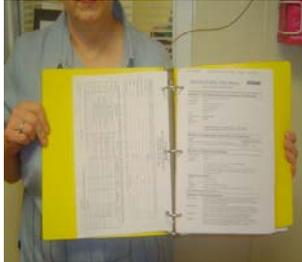
2. Hazard ingredients and identity information -- Hazardous components in the product
3. Physical and chemical characteristics -- Boiling point, vapor pressure, vapor density, solubility in water, specific gravity, melting point, evaporation rate, and appearance and odor
4. Fire and explosion hazard data -- Flash point, extinguishing media, special fire fighting procedures, unusual fire and explosion hazards
5. Reactivity data -- Stability, incompatibility with other products/substances, hazardous decomposition or byproducts
6. Health hazard data -- Signs and symptoms of exposure, medical conditions generally aggravated by exposure, emergency and first aid procedures, health hazard (acute or chronic)
7. Precautions for safe handling and use -- Precautions for safe handling and use, such as steps to be taken in case material is released or spilled; water disposal method; precautions to be taken in handling and storing; and any other precautions, respiratory protection, ventilation, protective gloves, eye protection, other protective clothing or equipment, or work or hygienic practices.
8. Control measures

The Occupational Safety and Health Agency (OSHA) of the U.S. Department of Labor requires that foodservice establishments have a hazard-communication program specific for the products used within the establishment. The foundation of the program is the MSDSs, which should be kept in a binder or a central file. MSDSs need to be provided for all hazardous chemicals used. Other requirements are that all containers of hazardous chemicals must also be properly labeled, tagged, or marked with the identity; display appropriate hazard warnings; and show the names and addresses of the manufacturers or other responsible parties. The hazard warning can be any message, words, pictures or symbols that convey the hazards of the chemical(s) on the container. The label must be legible, in English (and in other languages as needed), and prominently displayed. The following information is also required: a list of the hazardous chemicals located in each work area; a description of how employees will be informed of the hazards of both normal use and nonroutine tasks; and emergency procedures for spills, leaks or other accidents. The hazard-communication program must also address employee training. OSHA requires that program records are to be available upon request to employees and other designated government officials.

SOURCE: Occupational Safety and Health Agency. Information available at: www.osha.gov

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Material Safety Data Sheet



Cleaning and Sanitizing 196

The slide features a white background with orange decorative waves at the top and bottom. The 'foodsafety' logo is in the top left. The title 'Material Safety Data Sheet' is centered in green. A central photograph shows a person in a light blue uniform holding a yellow binder open to a page with text. The footer contains the text 'Cleaning and Sanitizing' and the number '196'.