

Kitchen Tool and Equipment Safety

FOODSERVICES in the United States employ 11.6 million people. Almost 30 percent of these employees are under age 20. Kitchen tool and equipment safety is essential for the health and protection of these workers. Safe operating techniques for deep-fat fryers, knives, French mandolines, and microplanes are discussed so you can be safe in the kitchen.



Objective:



Demonstrate safe tool and equipment operation.

Key Terms:



3-prong plug

arcing

blood-borne pathogens

Exposure Control Plan
(ECP)

FLSA

GFCI

ground

guiding hand

kitchen equipment

kitchen hand tools

NSF

OSHA

PPE

safety

UL

Understanding Kitchen Safety Procedures

Safety is the conscious act of avoiding injuries and loss. Kitchen safety is accomplished by training all workers in safe workplace practices and procedures. Foodservice staff must report safety hazards, accidents, and injuries to the appropriate supervisor, boss, or administrator. Safety systems include fire suppression, emergency plans, and fire exits. Employers are responsible for safety training and for ensuring that employees follow OSHA standards for the workplace.

SAFE TOOL AND EQUIPMENT OPERATION

Kitchen safety equipment includes:

- ◆ Fire extinguishers
- ◆ Ventilation systems (often with fire suppressant systems)

- ◆ Thermometers and gauges
- ◆ Fatigue and anti-slip mats, wet floor signs, etc.
- ◆ Machine guards (e.g., slicers, mixers, and blenders)
- ◆ Personal protective equipment (PPE) includes oven mitts, freezer mitts, dishwashing gloves, cut-resistant mesh gloves, aprons and uniforms, and non-slip shoes. According to OSHA, personal protective equipment or **PPE** is any specialized clothing or equipment worn by employees for protection against health and safety hazards. Various pieces of equipment are designed to protect the eyes, head, face, hands, feet, and ears.

Kitchen Hand Tools

Kitchen hand tools are manually held tools used to cut, mix, blend, sift, shape, measure, strain, grind, turn, and/or lift food. The list includes knives, graters, mandolines, shears, grinders, and can openers. Ignoring safety precautions and safe operation guidelines for use of kitchen hand tools can result in injuries to the user/worker.

Kitchen Equipment

Kitchen equipment is a set of items, including any pans, pots, steamers, warmers, ovens, scales, dollies, mixers (bench and floor models), automatic slicers, food prep tables, storage bins and shelving, refrigeration equipment, and dish machines. Ignoring safety precautions and safe operation guidelines for use of kitchen equipment can result in injury to the user/worker.

OSHA Standards

The Occupational Safety and Health Administration (**OSHA**) is the agency within the U.S. Department of Labor that ensures safe and healthy working conditions for U.S. employees by enforcing standards and providing workplace safety training. OSHA provides training, outreach, education, and assistance. The following OSHA standards are designed to provide a safe work environment:

- ◆ *Standard 1910.132(a)*. In brief, this OSHA standard directs employers to provide:
 - Hand protection when employees are performing any task that can cause injury to the hands. For example, cut-resistant gloves are hand protection that must be provided for employees performing cutting tasks.
 - Personal protective equipment (PPE) to all employees who per-



FIGURE 1. OSHA provides rules and regulations for worker health and safety in all industries. Which of these PPE images is related to the foodservice industry?

form a hazardous task. An example is oven mitts for the potentially hazardous task of taking items out of the oven.

- ◆ *Standard 1910.138(b)*. In brief, this OSHA standard directs employers to select and require employee use of appropriate:
 - Hand protection when employees' hands are exposed to hazards such as those from skin absorption of harmful substances.
 - Hand protection to avoid severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes.
- ◆ *Standard 1910.1030(c)(1)(i)*. Each employer having an employee(s) with occupational exposure as defined by paragraph (b) of this section shall establish a written Exposure Control Plan designed to eliminate or minimize employee exposure. Employers must provide an exposure control plan to protect employees from possible infections caused by bloodborne pathogens.

Electrical Safety

All electrical equipment use creates a threat of electrocution. Commercial kitchens have increased risks for electrocution due to spills and grease fires. The kitchen activities and/or electrical equipment that pose the greatest threat are worn electrical cords, wet cleaning practices, faulty wiring or equipment, damaged outlets or connectors, and the improper use of extension cords as well as the use of damaged extension cords.

Plugs and Outlets

Electrical plugs and outlets should have 3-prong grounded connections to protect workers from water and electrical shock accidents. OSHA standard 1910.304(f)(5)(v) requires that all electrical outlets near water sources must be properly grounded. A **3-prong plug** is an electrical connector that ensures proper grounding of the electrical circuit with the connected device (appliance). It is also called a 3-prong electrical outlet, a grounding outlet, a grounding receptacle, and a safety outlet.

A typical 120-volt outlet has two vertical slots and a D-shaped opening centered below the slots. One slot is slightly larger than the other. The larger slot is “neutral,” and the smaller slot is “hot.” The D-shaped hole is the “ground.” A **ground** is a direct electrical connection to the earth or a connection to a particular point in an electrical or electronic circuit.

Outlets located near water should be ground-fault circuit interrupter (GFCI) rated. A **GFCI** is a device that monitors the amount of current flowing from the hot to the neutral slot on the outlet. If there is an imbalance, it “trips” (shuts off) the circuit. A GFCI constantly monitors electricity flow to prevent electrical shock.



FIGURE 2. GFCI outlets look the same as grounded outlets except they have “test” and “reset” buttons to resume electrical service after a “shut off.”

Plugs and Cords

Check plugs and cords to ensure they are not frayed with wires showing. OSHA standard 1910.22(b)(1) requires establishments to provide floor or ceiling plugs so equipment power cords do not run across walkways.

Electrical appliances often have short cords so they do not dangle over the countertop and cause trips, falls, or spills. Do not use extension cords in a kitchen. In addition, keep electrical cords away from heat and water. Overloading circuits with multiple plugs in one outlet should be avoided.

- ◆ Ensure your hands are dry before plugging in an electrical appliance. OSHA standard 1910.334(a)(5)(i) requires managers to train employees not to plug or unplug equipment when their hands are wet. [NOTE: The correct sequence for plugging in an appliance is to connect the electrical cord to the appliance first and then insert the plug into the outlet.]
- ◆ Unplug electrical appliances properly when not in use, when cleaning, and when assembling. Never unplug equipment by pulling on the cord.

Electrical Equipment Operation

Do not use broken or damaged electrical appliances. The OSHA standard 1910.334(a)(2)(ii) indicates that damaged cords, receptacles, and portable electronic equipment must be removed from service and repaired before they can be used again. Follow manufacturers' directions. All electrical equipment should be operated and maintained according to these directions. Some electrical appliances (e.g., refrigerators) require ventilation. In addition, microwave cookware requires the use of approved utensils (no metal or recycled paper) to prevent arcing. **Arcing** is sparks inside the microwave oven caused by reactions to gold paint on dishes, twist ties, and other metallic materials. Raw carrots and hot dogs can cause arcing because of the uneven mixing of salts and additives in the hot dogs and the minerals in the soil used to grow the carrots. If arcing occurs, turn off the oven immediately because prolonged arcing could damage the oven.

Deep-Fat Electric Fryer Operation

Electric fryers (deep-fat fryers) are one of the most dangerous pieces of equipment to operate. Any of the situations listed may cause the fryer fat to overflow and result in burns, slips, and/or falls.

- ◆ Do not overfill the fat in the fryer.



FIGURE 3. This deep-fat fryer is temperature regulated and timed by the use of a computer touch pad.

- ◆ Do not drop food items into hot fat. (Place food items into hot fat with a slotted spoon or a mesh basket.)
- ◆ Do not place frozen foods with ice crystals into hot fryer fat.

Electrical Certification Marks or Logos and Other Guidelines

Certification marks or logos are used on electrical appliances to indicate testing of the products for electrical safety. The logo certifies the appliance. The certification marks include:

- ◆ Underwriters Laboratories, Inc. or **UL** is an organization that provides the most common independent electric safety testing and certification in the United States. UL is an independent nonprofit organization that writes and tests products for safety and certifies them.
- ◆ CSA—OSHA accepts the Canadian Standards Association as an alternative certification mark for UL. CSA is a nonprofit association that develops standards to enhance public safety.
- ◆ ETL—OSHA accepts the ETL Testing Laboratories or Intertek Testing Service as alternative marks for UL. If the ETL mark includes a small US and/or C, it follows product safety standards of the United States and/or Canada.
- ◆ CE—Conformance European is the certification mark used for electrical products within the EU. The European Union is 28 countries in Europe that formed for political and economic purposes. Once a product receives the CE mark, it can be marketed throughout the EU without undergoing further product modification.

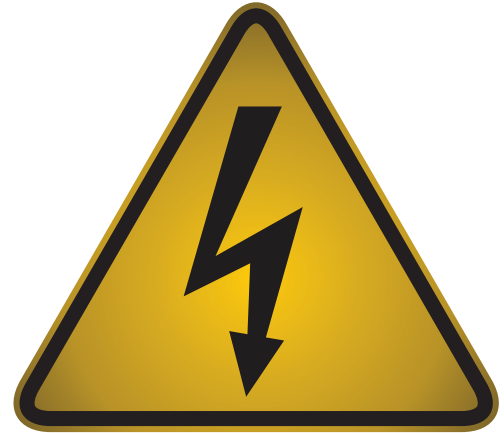


FIGURE 4. The UL logo indicates a tested and safe electrical appliance designed to prevent electrical shocks. This safety symbol represents high voltage and/or electric shock awareness.

Home wiring requirements vary by appliance type. Kitchen lighting, microwaves, dishwashers, and refrigerators each require a dedicated 20-amp 125-volt circuit. Kitchen electrical ranges require 50-amp 250-volt circuits. Commercial kitchen wiring requirements are based on the size and number of appliances.

Power-Driven Equipment Operation

Operating power-driven equipment requires extra caution. The Fair Labor Standard Act (**FLSA**) is a legal document that does not allow any employee who is under 18 years of age to operate power-driven equipment. Guidelines for the operation of power-driven equipment include:

- ◆ Proper assembly is mandatory as is the use of equipment guards and safety equipment.
- ◆ Ensure that your hair, clothing, and/or jewelry do not become attached to the moving parts of equipment. This may cause severe injuries (e.g., crushed fingers, broken arms, and amputations).

- ◆ Ensure no steam is escaping from a continuous feed dishwasher because live steam can cause burns.
- ◆ Turn off and unplug power-driven equipment before cleaning or removing blockages in grinders, slicers, and choppers. Use tamps or push-sticks when operating and removing blockages (OSHA rule 1910.212(a)(1)).
- ◆ All emergency stop buttons are red in color.
- ◆ Power-driven equipment must be anchored to prevent tipping.

KNIFE SAFETY

Knowing the guidelines for knife safety may prevent damage to or loss of your fingers.

Cut Hazards

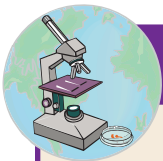
Cuts and puncture wounds are dangerous to employees and to customers. Human blood can transfer illnesses (e.g., HIV and hepatitis B virus). Therefore, any food that comes in contact with human blood must be discarded.

Potential hazards are:

- ◆ Knife cuts and punctures
- ◆ Sticks and punctures during restroom cleanup (e.g., sharp edges and needle punctures)
- ◆ Broken glass cleanup



FIGURE 5. Notice the red emergency stop button on this hamburger machine.



EXPLORING OUR WORLD...

SCIENCE CONNECTION: Foodservice and Hepatitis C

If blood comes in contact with food, the food must be discarded. The National Institute of Health discusses how an infected hepatitis C worker's blood can enter the body after a needle or sharps (knife) injury. Exposure may occur if blood from an infected individual contacts someone's eyes, mouth, or skin with a cut. Research more information on the conflicting opinions about hazards for foodservice workers at <http://www.nlm.nih.gov/medlineplus/ency/article/000284.htm> and http://www.bccdc.ca/NR/rdonlyres/3246DF1F-AC21-4B72-AFE1-4C93F8AC0AE4/0/HepC_Intheworkplace.pdf.

- ◆ Automatic cutting equipment (NOTE: Spinning blades are dangerous to workers, including blenders, food processors, and meat slicers.)

Basic cut prevention includes:

- ◆ Store knives safely (e.g., blocks, racks, and blade sheaths).
- ◆ Avoid crushing garbage bags because sharp objects can poke through.
- ◆ Use hand protection (e.g., wire mesh cut-resistant gloves).
- ◆ Avoid picking up needles.
- ◆ Avoid scooping ice with a glass. (NOTE: Glass shards can contaminate a bin of ice, so use plastic or metal scoops.)

Knife Use

- ◆ Let a falling knife fall. Watch your feet, and allow it to hit the floor. Pick it up only after it has stopped moving.
- ◆ To pass a knife to another person, place it on a tabletop. Allow the other person to pick it up.
- ◆ Carry a knife by the handle (at your side) with the blade pointed toward the floor.
- ◆ Keep knives sharp. Dull knives require more force to cut and may cause an accident.
- ◆ Cut only food products with knives. Use a knife for its intended purpose: slicing, chopping, boning, paring, etc.
- ◆ When cutting, position a knife for control and stability.
 - Hold a knife firmly by the handle. Rest the side of an index finger on one side of the blade. Place the thumb on the other side of the blade.
 - Control the cut with the guiding hand. The **guiding hand** is a person's non-knife hand held in a "claw" grip. Curl your fingers into a claw or spider form with fingertips tucked into the food to be sliced and resting on the cutting board for stability.
- ◆ Use a nonporous cutting board to protect the blade and the countertop or tabletop and to reduce the risk of cross-contamination.
- ◆ Cut away from your body.



FIGURE 6. The chef is demonstrating the "claw" grip. Also, note the color-coded cutting board. "Green" is for fruits and vegetables.



DIGGING DEEPER...

UNCOVERING ADDITIONAL FACTS: Knives

Learn all you can about knives. What are the names of the parts, types, handles and grips, steel or ceramic material composition, and forged or stamped manufacture? Be ready to purchase your own set of knives by understanding terms such as tang, heel, bolster, and butt. Read all about knives at <http://www.foodservicewarehouse.com/>.

Knife Cleaning and Storage

- ◆ Clean dirty knives immediately. Separate them from other dishware and pots and pans.
- ◆ Never place dirty knives where a worker might grab one by accident (e.g., in a pile of dirty dishes or in a sink filled with water).
- ◆ Wipe (dry) knife blades with the sharp edge facing away from your hands.
- ◆ Clean knives after sharpening with a whetstone or steel to remove metal deposits.
- ◆ Clean and sanitize knives before storing them.
- ◆ Store knives in sheaths, guards, blocks, or on magnetic strips. Never store knives flat in a drawer.

Exposure Control Plan

An exposure control plan (ECP) is designed to minimize or eliminate exposure to blood and other body fluids. Each foodservice facility writes a specific plan to eliminate or minimize occupational exposure to blood-borne pathogens and other diseases transferred by human blood. Kitchen workers and customers are at risk of human blood exposure and the transfer of disease agents through that blood. **Blood-borne pathogens** are pathogenic (disease-causing) microorganisms present in human blood and can cause disease in humans. Examples are hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

POT, PAN, TOOL, PLATE, AND ICE SAFETY TECHNIQUES

It is important to know these safety techniques to prevent injuries and accidents.

Pot and Pan Safety

Kitchen pot and pan safety techniques include:

- ◆ Assume every pot and pan on a range is hot.
- ◆ Avoid pot/pan handles reaching across the burner or electrical unit on the range.

- ◆ Point pot/pan handles toward the center of the range and not into the walkway where others might reach for them or the cook might bump into them.
- ◆ Avoid overfilling pots and pans (e.g., boilovers and burns).
- ◆ Attend to the task to avoid foods boiling dry, fat catching fire, or a pan melting a burner or electric unit on the range. Never leave food heating in a pot or pan unattended.
- ◆ Protect your hands from hot plates, pots, pans, and service items with mitts and gloves (e.g., cooks, dishwashers, and servers).



FIGURE 7. The blue insulated handle of this pan does not extend into the walkway. Is it a safety hazard?

Hand Tool Safety

Kitchen hand tool safety techniques include:

- ◆ Graters, planes, mandolines, and microplanes are potential cut hazards.
 - Attention to the task and finger placement is imperative when using graters and planes.
 - Attention to the task and finger placement is imperative when using a mandoline.
 - Use of the protective pusher block and caution when changing blades is recommended.



FIGURE 8. The microplane and French mandoline are potential cut hazards and require constant attention while using the tools. Notice the gloves worn by the chef using the mandoline. The glove is not a safety tool; it is preventing the cooked beet juice from staining the chef's hands.

Turning and lifting utensils safety techniques include:

- ◆ Use the correct utensil to turn and lift foods to avoid splattering hot liquid or fat.
- ◆ Avoid dropping any food into hot liquid or fat.

Plate and Ice Safety

Plate safety techniques include:

- ◆ Avoid burns from handling plates under a heat lamp (e.g., mitts and towels).
- ◆ Use serving trays to carry hot plates.
- ◆ Avoid cleaning up broken glass or pottery with your hands.
- ◆ Ensure any plates used in a microwave oven are safe for that use. Arcing and/or breaking may occur with non-microwave safe plates.

Ice safety techniques include:

- ◆ Use a scoop—never a glass—to gather ice.
 - Glasses can chip and break when plunged into ice.
 - Blood from hands and/or tiny glass shards can contaminate the ice bin or ice machine.
 - Servers avoid staphylococcal food poisoning by scooping ice into glasses rather than running their hand through the ice while holding the glass. Humans are the most common source of *Staphylococcus aureus* bacteria, and hands are often the most contaminated part of humans.
- ◆ NSF-certified plastic scoops for ice are recommended. The National Sanitation Foundation (**NSF**) is an independent product testing organization that tests, audits, and certifies product safety.



FIGURE 9. Have you ever watched a waitperson scoop ice into a glass while holding it? Chips, shards, blood, and/or staphylococcal food poisoning may be transferred to the ice-filled glass. The correct way to gather ice is to use an NSF-certified scoop. Should the scoop be stored in the ice bin?



FURTHER EXPLORATION...

ONLINE CONNECTION: Restaurant Safety Puzzle Quiz

According to OSHA, U.S. restaurants and other eating and drinking businesses employ 11.6 million people. Nearly 30 percent of these employees are under age 20. Many young workers start out in the restaurant industry. So OSHA is providing this eTool to help young workers in the restaurant industry be safe and healthy on the job. Get ready to take an online interactive restaurant safety quiz by researching the “Young Worker Safety in Restaurants ETOOL” at <https://www.osha.gov/SLTC/youth/restaurant/foodprep.html>. Then take the online Restaurant Safety Puzzle Quiz on Cooking and Food Preparation to help you review for “Kitchen Tool and Equipment Safety.” Other topics with quizzes on the site are Serving, Delivery, Cleanup, Drive-thru, General, and Resources.

Summary:



Kitchen tool and equipment safety is essential in a foodservice facility. Workers must be aware of the safe operating techniques of equipment: cords, outlets, plugs, deep-fat fryers, and power-driven equipment. Restaurant workers are most at risk of cuts. Knowing how to safely use, clean, and store knives is important to worker safety. OSHA standards are designed to safeguard the workers and to address kitchen tool and equipment safety. However, to work as planned, the workers must follow the standards, and the employers must provide training and PPE plus ensure that employees use the PPE.

Checking Your Knowledge:



1. What is the mission of OSHA? Explain two OSHA standards that relate to the foodservice industry.
2. What are 3-prong plugs and GFCI outlets? Why are they important to your safety in the workplace and at home?
3. What is the most common certification mark used on electrical appliances in the United States? What does the mark certify?
4. List four knife safety techniques.
5. List four tool safety techniques.

Expanding Your Knowledge:



Do not complain the next time you have to put on a kitchen apron or chef's jacket at work or school. Kitchen aprons and chef's jackets protect your clothing and provide an extra layer of protection for your skin from hot oils and chemicals. The kitchen apron or chef's jacket is part of the personal protection equipment (PPE) that should be provided for employees in commercial kitchens.

PPE is designed to protect the worker from burns, cuts, and other injuries. Some other PPE include wire mesh cut-resistant gloves, dishwasher gloves, and freezer gloves. Find out why these gloves are used and how they work. Learn more by researching online. Then write a paper about what you learned about the gloves.

Web Links:



Knife Safety

<http://www.ehs.uconn.edu/forms/TTT/SuppMat.pdf>

Safety in the Kitchen

<http://www.fsafood.com/main/serviceareas/portland/portlandArticleTemplate.aspx?nid=0aab6b95-5a4d-4bd9-bf00-7f3531fa2b8d>