Commercial Cooking

Commercial cooking operations are defined as kitchens that have cooking equipment that produces grease and grease-laden vapors. This includes flat grills, char broilers, and deep fat fryers. With this equipment comes a risk of kitchen fires. A kitchen fire can destroy your property, particularly if the fire grows beyond the kitchen. Taking a few steps will help make sure that your property remains safe for years to come. The following sections cover the basics for keeping you and your property safe.

The Exhaust System

A kitchen hood and ventilation system should include an exhaust hood, ductwork, fan system, and a means of providing adequate make-up air (see diagram on page 4). During the cooking process, droplets of grease become suspended in the air and can accumulate on the surrounding areas where they can fuel a fire. The exhaust system is designed to suck the droplets through grease removal devices, through the duct, and to outside of the building. The air that has been exhausted outside should have had most of the grease removed. Other important factors of the exhaust system include:

- The hood and ventilation system should be professionally installed according to National Fire Protection Association (NFPA) 96: Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.
- Local fire officials should be consulted as well since additional requirements under county and/or municipal codes may apply.
- The hood portion of the exhaust system should be constructed of and supported by 18-gauge minimum steel or 20-gauge minimum stainless steel.
- The duct portion of the exhaust system should be constructed of and supported by 16-gauge or 18-gauge stainless steel or materials that are UL (Underwriters Laboratories) listed or FM (Factory Mutual Global) approved and installed in accordance with their listing. Access to the interior surfaces of the duct work should be provided to allow for cleaning.
- Exhaust fans and motors should be UL listed and rated for continuous operation. Fans should be able to provide a minimum air velocity of 500 feet per minute through the duct.
- The hood must be equipped with the appropriate grease removal filters. Only baffle style filters comply with NFPA 96. Mesh filters are no longer appropriate for commercial cooking operations.
- Lighting units should be equipped with tight fitting protective globes that are installed in accordance with NFPA 70: National Electric Code by a licensed electrician.
- Hoods, ducts, grease removal devices, and exhaust fans should be kept 18 inches away from combustible materials.

Automatic Extinguishing System

- All cooking equipment that produces grease or grease-laden vapors should be equipped with an approved automatic extinguishing system that complies with the UL 300 Standard. This standard went into effect in 1994. Note: Dry chemical systems are no longer adequate at extinguishing grease fires associated with using today's high temperature cooking oils.
- Fusible links are part of the detection system and are located in the hood above each cooking appliance or grouping of appliances. NFPA 96 requires that these be replaced semiannually or more frequently if needed.
- It is very important to make sure there are enough nozzles and that they are positioned correctly over each cooking appliance. If a fire occurs where a nozzle is not located, then the fire may grow large enough to overwhelm the system.
- Keep nozzles covered with caps. The nozzle cap is there to protect the discharge opening from becoming clogged with grease and dirt and is designed to drop away in the event of a fire.

Automatic Extinguishing System (continued)

- A minimum of one manual activator should be installed along the path of egress. The activator is to be used if a fire occurs and the automatic extinguishing system fails to activate. Kitchen staff must be trained on the proper operation of the manual activator and where it is located in the kitchen.
- The automatic extinguishing system must be connected to an automatic fuel/power shut off that cuts all fuel/power to the cooking equipment immediately after the automatic extinguishing system is activated.

Type K Fire Extinguisher

- The Class K fire extinguisher is specifically made for use on fires in cooking appliances. The extinguishing agent discharges as a fine mist, which helps prevent grease splash and fire re-flash while cooling the appliance. Other types of fire extinguishers may not work on a cooking fire.
- A Class K extinguisher will typically be a silver color and should be located no more than 30 feet from the cooking area.

Installation of Cooking Appliances

Deep Fat Fryers

- Deep fat fryers are a major cause of kitchen fires. Oil can splash and easily come into contact with an open flame from an adjacent piece of cooking equipment, such as a gas-fired range. To prevent this from happening, a 16-inch space must be maintained between the deep fat fryer and any open-flame cooking appliance. If a 16-inch space is not possible, a vertical noncombustible barrier extending eight inches above the top of the deep fat fryer or open-flame cooking appliance can be used instead
- If a deep fat fryer gets too hot, it will self-ignite. All deep fat fryers should be equipped with a high temperature limiting device, which will shut off the fuel or energy in the event the cooking oil exceeds a temperature of 475 degrees Fahrenheit.

Ranges, griddles, broilers, etc.

- These appliances should be installed with clearance in accordance with their listing and manufacturer's instructions.
- If griddles are used for frying burgers, bacon, or other items that produce grease vapors, this appliance needs to be protected by a hood and ventilation and an automatic extinguishing system.

Maintenance

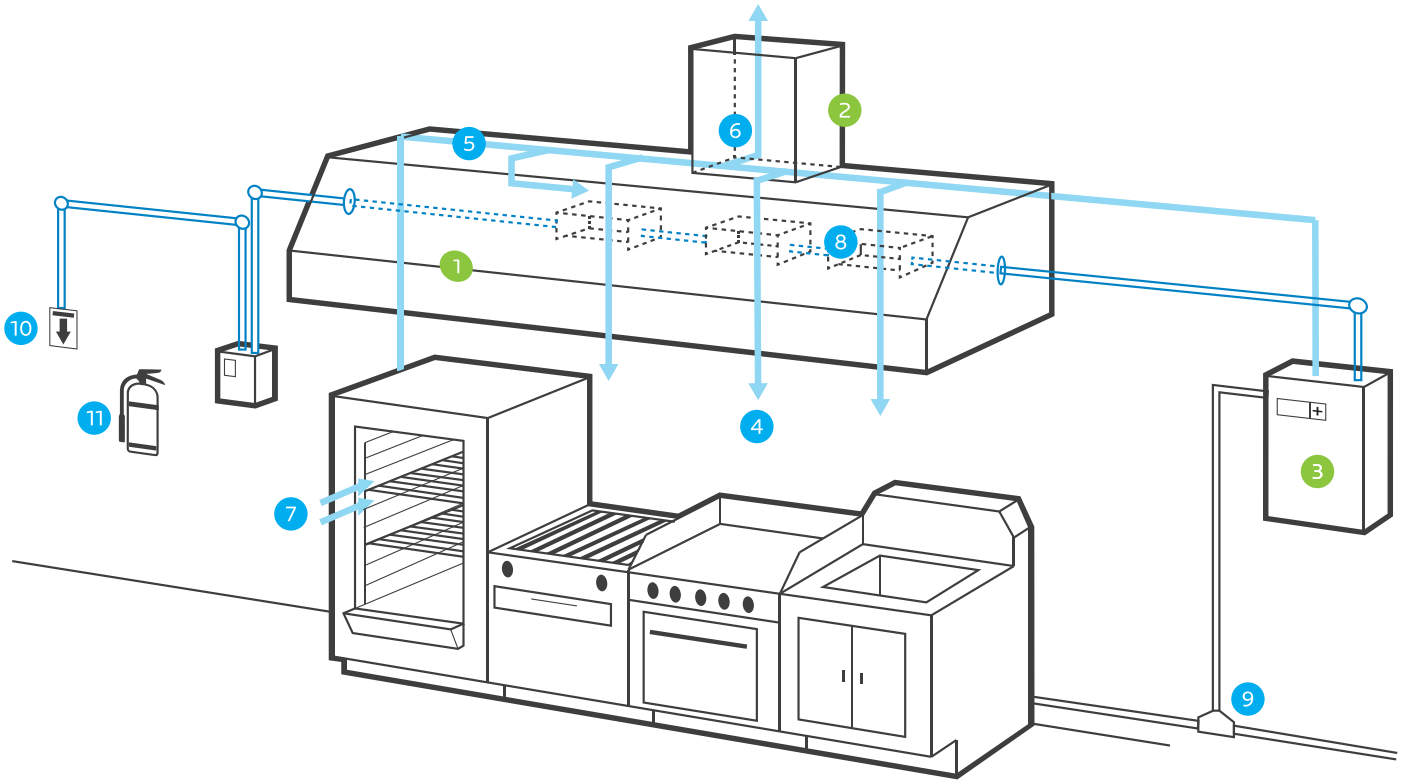
- A written cleaning schedule should be established indicating the methods of cleaning and the time intervals.
- Improperly serviced systems are less likely than properly serviced systems to work when needed. Hoods, grease-removal devices, fans, ducts, and other equipment should be serviced by a qualified contractor at intervals necessary to prevent the accumulation of grease. Some examples are:
  - Low-volume cooking operations such as a banquet hall, golf course, or a seasonal restaurant may only need service annually.
  - Moderate-volume cooking should have the hood and duct work serviced and cleaned by a certified and licensed professional at least semiannually.
  - High-volume cooking such as 24 hour operations, charbroiling, or wok cooking should be serviced and cleaned quarterly.
  - Solid fuel cooking such as wood and charcoal should have hood and duct work cleaned monthly.
- Cleaning the hood and duct work yourself is not allowed per NFPA 96. Cleaning must be done by a trained, qualified, and certified person.

Maintenance (continued)

- Following the inspection or cleaning, a label indicating the date cleaned and the name of the servicing company should be prominently displayed. It is recommended that this label be attached to the exterior of the hood in a visible location.
- Fire extinguishers should be maintained at regular intervals. At a minimum, it should be once per year or when specifically indicated by a manufacturer's recommendations.
- Grease that builds up can fuel a fire. Grease extractors and baffle filters may need weekly or even daily cleaning to prevent a buildup from forming. Other kitchen surfaces should be cleaned daily to prevent grease buildup as well.

References

- National Fire Protection Association (NFPA) Standard 96: Standard for Ventilation Control and Fire Protection of Commercial Cooking Operation
- Underwriters Laboratories (UL) Standard 300: Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas



1. Hood
2. Exhaust duct
3. Automatic extinguishing system and control box
4. Cooking surface nozzles
5. Plenum nozzles
6. Duct nozzles
7. Broiler nozzle
8. Fusible links
9. Automatic fuel shut-off
10. Remote manual pull station
11. Class K fire extinguisher