



## CAMPUS FIRE SAFETY CODE TALK

Campus Fire Safety e-NewZone

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### The top 7 fire safety items you need to know about your commercial cooking operations

Many colleges and universities have their own cafeteria as well as some nationally recognized franchises. Facility managers and restaurant managers are charged with protecting their facilities from a potential fire by complying with the minimum fire safety requirements adopted by the local jurisdiction. In a 2012 report titled, "Structure Fires in Eating and Drinking Establishments" by Ben Evarts, U.S. fire departments responded to an estimated average of 7,640 structure fires per year in eating and drinking establishments between 2006 and 2010. These fires caused an average annual loss of two civilian deaths, 115 civilian injuries and \$246 million in direct property damage. Provided with this information, it's no wonder why fire protection is at the top of the menu for many managers.

NFPA 96: *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, is a standard that provides preventative and operative minimum fire safety requirements related to the design, installation, operation, inspection, and maintenance of all public and private cooking operations. The current 2017 edition of NFPA 96 provides users with the requirements for exhaust systems, clearance requirements, construction materials for hoods, types of fire extinguishing equipment, routine cleaning, employee training, solid fuel cooking and the inspection, testing and maintenance of the equipment in the facility.

Understanding the purpose or the requirements and applying the provisions in NFPA 96 will reduce the potential fire hazard and probability their restaurant turns into another statistic:

1. **Cooking equipment used in processes producing smoke or grease-laden vapors are required to be equipped with an exhaust system.**



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Although many would think this is a straight-forward requirement, the number of questions the NFPA Advisory Service Program receives on this section is surprising. Depending on the type of food being cooked, how that food is being cooked, the cooking medium, cooking appliance, and how often this is taking place are all the important factors to consider in answering this question. For example, grilling burgers and frying french fries will produce grease-laden vapors in that cooking process and will require a Type I exhaust hood to capture the grease laden vapors and remove them from the kitchen. In another instance, if muffins are being baked in an oven, a Type II hood, which is designed for heat and steam removal and other non-grease applications, would be required. However, Type II hoods are not applicable to NPFA 96.

The only exception to this rule is if the cooking equipment has been listed in accordance with ANSI/UL 197, *Standard for Commercial Electric Cooking Appliances*, or an equivalent standard for reduced emissions, in which case an exhaust system is not required. This requirement specifically applies to equipment served by recirculation systems, also known as ventless type cooking equipment, which is addressed in Chapter 13 of NFPA 96.

### 2. Recognizing the Significance of Clearance Requirements

The issue of clearance from cooking equipment to combustible material is particularly important to prevent fires from spreading. Fires that burn in ducts can reach very high temperatures. Extremely hot temperatures in a duct can create a large amount of radiant heat on the outside of the duct even where the duct is not compromised. In this case, the radiant heat has the potential to ignite combustible materials and start fires in the combustible concealed spaces of a building. Maintaining a clearance from the duct to combustible and limited-combustible materials is intended to reduce this risk.

Section 4.2 of NFPA 96 states where enclosures are not required, hoods, grease removal devices, exhaust fans, and ducts are required to have a minimum clearance of 18 inches to combustible material, 3 inches to limited-combustible



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material, and 0 inches to noncombustible material. Note that the definitions for combustible material, limited-combustible material and non-combustible material are provided in Chapter 3, and examples of each of these materials is provided in the annex.

Although these requirements are directly related to construction requirements, the clearances should still be observed in the ongoing operational life of the system. Placing combustible boxes on top of a hood or directly against the side of it, for example, can present the very same hazards discussed above.

In many existing facilities, combustible material might already be present and the clearance requirements specified above will be difficult, if not impossible to achieve. Section 4.2.3 of NFPA 96 provides requirements for clearance reduction systems.

### **3. Hoods - Inside and Out**

Chapter 5 of NFPA 96 provides all hoods requirements. The three main sections address hood construction materials, how to construct the hood, and hood size.

Hoods are required to be constructed of and be supported by steel not less than No. 18 MSG in thickness, stainless steel not less than No. 20 MSG in thickness, or other approved material of equivalent strength and fire and corrosion resistance. In addition, all seams, joints, and penetration of the non-listed hood enclosure that direct and capture grease-laden vapor and exhaust gases are required to have liquidtight continuous external weld to the hood's lower outmost perimeter. The purpose of the continuous welds are to prevent grease and, in the event of a fire, the flame from extending into the overhead of the building.

A common misconception is that NFPA 96 requires a specific value for the size of a hood. Section 5.2 requires hoods to be sized and configured to provide for the capture and removal of grease-laden vapors. While overhang dimensions



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are typically provided for listed hoods, based on the requirement in Section 5.2, no overhang is actually specified or even necessarily required.

In order to determine the size of a hood, the front and side overhang requirements from the hood to the cooking appliance, dimensions "F" and "S" respectively. For example, the hood listing could call for 12 inches for dimension "F" when the hood is over a charbroiler, 9 inches when over a griddle, and only 6 inches when over a convection oven. One important difference between the non-listed and the listed hood is that the listed hood "F" dimension is measured from the front of the cooking surface, not the front of the cooking appliance.

While the hood can be sized perfectly at the initial installation, installing new cooking equipment underneath the hood, or moving the equipment for cleaning and not returning it to the properly location defeats the proper hood sizing.

Stay tuned for Part 2 of our article, "The top 7 fire safety items you need to know about your commercial cooking operations," in the February issue, where Ms. Wilmot will discuss exhaust duct systems, fire extinguishing systems, maintaining commercial cooking operations, cleaning, and more.

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