# Commercial Kitchen Fires Fire Protection Systems That Should Work

& Subrogation Strategies That Do Work

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#### According to a 2017 study published by the National Fire Protection Association ("NFPA"), 61% of restaurant fires originate within cooking equipment.

However, although almost two-thirds of restaurant fires originate within cooking equipment, only 38% of restaurant fires that cause direct property damage originate within cooking equipment. That tells us that many restaurant fires that originate within cooking equipment cause no significant property damage. The reason restaurants are able to avoid such property damage when fires occur is the use of effective kitchen exhaust systems and fire suppression systems, which, if installed and maintained correctly, work.

The bad news is that these systems are not always installed and maintained properly and do not always work. The silver lining to the bad news is that when those exhaust systems and fire suppression systems do not work, the resulting cases frequently present good subrogation potential. Turning that subrogation potential into subrogation recoveries requires early intervention, the right experts and the right strategies.

## THE RISK

Restaurants and other commercial kitchens can pose a high risk of fire damage because commercial cooking involves cooking oils and food products that produce flammable, grease laden vapors. These vapors deposit grease on cooking surfaces and create an easily ignitable fuel source. Cooking equipment and appliances – such as stoves, ovens and fryers – provide heat and flames, and therefore, competent sources of ignition. Further, flareups on cooking surfaces are common.



This combination of grease-covered surfaces and many potential sources of ignition is a prescription for a commercial kitchen fire. Unless extinguished quickly, these fires can easily spread and cause injuries and damage.

#### **MINIMIZING THE RISK**

Fortunately, there is a reliable combination of systems that can minimize the chances of a fire occurring in a commercial kitchen, as well as the risk that a fire will spread and cause damage should one ignite. Those systems include (1) specialized exhaust systems, and (2) specialized fire suppression systems that are designed to work in conjunction with exhaust systems.



Source: https://blog.a1ssi.com/12-year-hydrostatic-test-kitchen-suppression-systems/

# THE EXHAUST HOOD AND GREASE EXTRACTION SYSTEM

A commercial kitchen's exhaust hood and grease extraction system serves to remove grease laden vapor from the kitchen and encapsulate the inevitable grease buildup within the exhaust system, which can contain and prevent the spread of a fire for a limited period of time. The kitchen's fire suppression system is specifically designed to extinguish and prevent the ignition of grease fires within the exhaust system.

For an exhaust system to function appropriately, a properly sized and powered exhaust hood should be located above all cooking appliances that generate heat and expel greasy vapors. Exhaust hoods ventilate the heat and vapors, and confine the vapors, grease and heat within the exhaust hood. Exhaust hoods are made of non-combustible metal, and should be constructed with liquid tight welds, i.e. no holes or gaps. Exhaust hoods are connected to ducts, which disseminate heat and vapors outside the kitchen. Exhaust hoods and associated ductwork must be placed in locations that are clear of combustibles.

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, sets forth specific standards, guidelines and best practices related to the construction, location and functioning of exhaust hoods and ducts.

# PROBLEMS THAT ARISE WITH EXHAUST HOODS & GREASE EXTRACTION SYSTEMS

Exhaust hoods can fail to function properly if they are not constructed to be liquid tight. A gap or hole can allow fire to escape the hood. A hood may also cause a problem if it is placed too close to combustibles. If a fire occurs within the hood, heat from the fire may ignite combustibles near the hood or ducts. Next, an exhaust hood may fail to perform as intended if excess grease accumulates within the hood or ducts, providing fuel for a fire. This can occur due to inadequate cleaning practices, and/or if the duct system is designed with insufficient access points to permit thorough cleaning. Finally, an exhaust fan that is improperly sized or powered may be insufficient to effectively dispel heat and grease, leading to a fire.

#### POTENTIAL PROBLEMS WITH EXHAUST HOODS AND DUCTS

Hood is not liquid tight (i.e. contains holes or gaps) <sup>2</sup> Hood or duct is located too close to combustibles <sup>3</sup> Excess grease accumulation within hood or duct

Duct system is designed with inadequate access points to permit thorough cleaning 5 Inadequate exhaust fan



Insufficient Clearance Between Duct Attached to Exhaust Hood & Nearby Combustibles



Grease Laden Duct

Any of the above hazards can lead to a dysfunctional and unsafe exhaust hood and duct system within a commercial kitchen.

#### THE FIRE SUPPRESSION SYSTEM

The purpose of a wet chemical fire suppression system is to control and extinguish a fire on a cooking appliance or within an exhaust system while it is in an incipient stage, before the fire can spread and cause significant damage. The design, placement and function of these systems are governed by NFPA 17, *Standards for Wet Chemical Extinguishing Systems*.

Wet chemical extinguishing systems are generally composed of multiple components, including **piping, fusible links** (also known as "activation devices"), and **fixed nozzles**. These components connect to a **wet chemical container or tank**, which is filled with a solution of water and potassium carbonate-based or acetate-based chemicals.



Source: favpng.com



Nozzle

Fusible Link

Wet Chemical Container

#### POTENTIAL PROBLEMS WITH CHEMICAL SUPPRESSION SYSTEMS

Wet chemical suppression systems may fail to function as intended because of design problems, installation problems, or inadequate inspections/maintenance.

First, the actual setup of a suppression system can pose a problem if the system's nozzles are improperly placed or positioned. Improper placement can prevent the system's chemical solution from reaching and extinguishing a fire should one occur. Similarly, the fusible links, or activation devices, could be improperly located, causing a delay in sensing a fire and activating the suppression system. Finally, if the suppression system's piping is not installed properly, the chemical solution may not be evenly and appropriately distributed upon activation of the system.

Problems may also arise if a fire suppression system is not routinely and thoroughly inspected. Regular inspections are necessary to ensure that:

- Nozzles are correctly positioned and have not been knocked out of place or moved
- The activation cables attached to the fusible links are clean and running freely
- The chemical canister is properly pressurized and is replaced as required



# **KEYS TO RECOVERY - INVESTIGATING COMMERCIAL KITCHEN FIRES**

Early intervention and a prompt investigation are critical to determining how a commercial kitchen fire started, and whether the fire spread because of a specific problem or deficiency within the exhaust hood, ducts or the fire suppression system. The investigation should begin with the retention of a qualified expert with experience in investigating commercial kitchen fires, preservation of the fire scene, and retention of critical evidence. Notifying all potential subrogation targets is then critical to avoid a later spoliation argument. These potential subrogation targets include:

- Exhaust hood installer
- Exhaust hood and duct cleaning company
- Cooking equipment manufacturer

Cooking equipment installer

- Restaurant operator
- Suppression system installer
- Suppression system inspection company

Consideration and analysis of the relevant NFPA standards, as well as any other applicable codes or standards, is also imperative. These codes and standards establish the standard of care for various professionals involved in the design, installation, inspection, maintenance and cleaning of exhaust hoods, ducts and suppression systems. Violation of these codes and standards may provide a foundation for proving a negligence claim in litigation.

In sum, a number of factors can come into play when it comes to the cause and spread of a commercial kitchen fire. When it comes to fire spread claims in commercial kitchens, specialized expertise related to exhaust and suppression systems can provide the foundation for a strong subrogation case against multiple potential liability targets.



# **Contact Us**

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