The Basics of Commercial Kitchen Exhaust Cleaning

IKECA is a global trade association representing cleaners and inspectors of commercial kitchen exhaust systems.

In cleaning or inspecting, the job is all about providing a safe environment. As a member of IKECA, we are dedicated to fire prevention and the protection of life and property.

IKECA is committed to assisting Fire Marshals and all Authorities Having Jurisdiction (AHJs) in understanding their key role in maintaining a safe environment for any establishment with commercial kitchen exhaust systems.

ANSI/IKECA C10: Standard for Cleaning of Commercial Exhaust Systems

IKECA Introduces the Kitchen Exhaust Cleaning Industry’s First American National Standard for the Cleaning of Commercial Kitchen Operations

PHILADELPHIA, PA, April 26, 2012: The International Kitchen Exhaust Cleaning Association (IKECA), an international non-profit trade organization committed to fire prevention and life safety by promoting kitchen exhaust cleaning to a higher standard, today announced the availability of a new American National Standards Institute (ANSI) standard, IKECA C10-2011, Standard for Cleaning of Commercial Kitchen Exhaust Systems. For the first time, commercial kitchen exhaust cleaners, owners and managers of facilities, authorities having jurisdiction, insurance loss control specialists, and others have guidance on industry-accepted processes and procedures for cleaning kitchen exhaust systems.

The IKECA C10 standard represents a major commitment to advance the kitchen exhaust cleaning industry. It brings greater attention to the vital role of properly cleaning these systems for fire prevention and life safety. IKECA C10 is designed to complement and augment NFPA 96®-2011, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, which has long been the only standard for the minimum fire safety requirements related to the design, installation, operation, inspection, and maintenance of all public and private cooking operations.
Major components of the standard include:

- Pre-Cleaning Operations Inspection
- Energy Source Protection
- Protection of Workspace Areas
- By-Product Control Process Preparation
- Process Personnel Protection
- Cleaning Processes and Controls
- Exhaust Duct Access and Labeling
- Exhaust Cleaning Process Reporting

According to the National Fire Protection Association, the majority of restaurant fires originate on the kitchen cooking appliances and flare into the kitchen exhaust system. Regular maintenance of a restaurant’s kitchen exhaust system is one of the primary defenses against fire hazards. Keeping these systems working at their best will maximize their ability to evacuate the smoke and grease out of the building and produce a cleaner, cooler kitchen and better working environment for staff.

Two Boston firefighters were killed on August 30th, 2007 when a fire at a neighborhood Chinese restaurant grew into a fast-moving inferno. Investigators say the fire burned inside a drop ceiling where grease had accumulated for an hour or more before it was reported, as unaware diners ate and employees cooked. No employees or customers were injured. But, Paul Cahill, 55, of Scituate, and Warren Payne, 53, of Canton, were killed. Cahill served on Engine 30 and Payne on Ladder 25, units housed at the same fire station just down the street from the restaurant. Ten firefighters and a paramedic were also injured in the four-alarm fire at the one-story restaurant.

The exhaust system was not properly maintained or inspected, had many deficiencies, and had not been properly cleaned by a certified exhaust system cleaning company.

So why are we here?
As a result of this tragic event new policies and procedures have been implemented in Boston and we are starting to see similar changes in many other cities.

- In Boston: All commercial hood and ventilation cleaning companies/contractors performing work in the city of Boston are required by law to issue deficiency reports to the establishment owner when they do not comply with NFPA 96 mandated repairs and also if there is no onsite exhaust system diagram. All deficiency reports must be given to the establishment and a copy forwarded to the Boston Fire Department - Fire Prevention Division by following the instructions listed on our website.
- Commercial hood and ventilation cleaning companies/contractors must also report to the Boston Fire Department – Fire Prevention Division when an establishment in Boston does not renew their contract or if the company did not clean the hoods and ventilation systems by the scheduled date required in NFPA 96.
- The Boston Fire Department’s Sample Cleaning and Inspection of Commercial Hood and Ventilation System & Deficiency Report has been updated currently. All related information and required forms can be found on [http://www.cityofboston.gov/fire/inspections/exhaust.asp](http://www.cityofboston.gov/fire/inspections/exhaust.asp).

While there may not be any legislation or current legislation in your area, we are hoping to start the education process by speaking with you today.
Grease filters, when installed correctly, are the first line of defense in case of a fire. The picture below is the reality of cooking techniques used daily in restaurants. Flames are often within inches of the filters.

Filters must be maintained and cleaned by the establishment or have a filter exchange program in place. There are two types of filters that are permitted by NFPA code 96.

**Baffle Filter** – Most common

**Spark Arrestors** – used for above wood burning equipment.
NFPA Code 96 – 6.1.3 Mesh filters shall not be used unless evaluated as an integral part of a listed exhaust hood or listed in conjunction with a primary filter in accordance with UL 1046.

In order to keep sparks from entering the duct work all filters must be placed at a 45 degree angle flush with the hood with no gaps present.

Incorrect Incorrect

This is what filter placement should look like. Filters must be at least 18” above the cooking equipment.
A proper exhaust system is essential in kitchens to ensure that they are odor free and grease free. Gas cook tops add three unwelcomed gases to the environment; these gases are carbon dioxide, carbon monoxide, and nitrogen dioxide. It is necessary to get rid of these gases from the air in the kitchen to provide a safe work environment.

The plenum area, behind the filters, accumulates the grease laden vapors and the grease continues up the ductwork.

What we would see after 6 months of a school or nursing facility

What we would see 13 weeks after a cleaning of a fast food restaurant

This is an exhaust system of a fast food restaurant that was not cleaned properly by a non-certified company for years. During the first cleaning, 65 pounds of grease was removed from the duct work. The fire suppression system would not have gone off should there have been a fire.
The picture below shows an exhaust system installation prior to completion. The ductwork can be clearly seen. Ductwork is vitally important to carry grease laden vapors out of the cooking area but more importantly its primary function is to carry and contain a fire should there be one.

This picture shows ductwork that goes straight to the fan, the system has been cleaned to bare metal and no need for access doors.

This system does not go directly to the fan, there is approximately 40 feet of duct work and 4 access panels between the plenum area and the exhaust fan.

View from the filter area  View from the fan looking down
According to NFPA 96, all access panels shall conform to the following standards:

- 7.1.6 A sign stating the following shall be placed on all access panels:
  - Access Panel – Do Not Obstruct

- Openings shall be provided at the sides or top of the duct and at changes of direction.

- 7.3.4 For hoods with dampers, an access panel for cleaning and inspection shall be provided in the duct or hood within 12 in of the damper.

- 7.4.1.1 On horizontal ducts, at least one 20x20 in opening shall be provided for personal entry.

- 7.4.1.2 Where an opening this size is not possible, openings large enough to permit through cleaning shall be provided every 12 ft.

- 7.4.2.2 Where personnel entry is not possible in vertical ducts, access for cleaning shall be on each floor.

Access doors must meet NFPA Code 96 by meeting the 1500°F rating and also be grease tight. The access door below is made of cardboard covered by duct tape. Grease can also be seen leaking from the seams of the ductwork.
Approved NFPA access doors.

According to NFPA Code 96, ductwork must be a liquid tight continuous external weld in order to hold fire. They must also be constructed and supported by carbon steel not less than .054 inch or stainless steel not less than .043 inch.

House duct work used for the grease exhaust for a restaurant that houses 2 apartments above it.

Different types of duct work pieced together with duct tape.

Ceiling tiles that show damage from ductwork that is leaking from above.
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NFPA 8.1.1.1 Approved Upblast fans with motors surrounded by the airstream shall be hinged, supplied with flexible weatherproof electrical cable and service hold-open retainers, and listed for this use.

Correctly hinged fans  Not to code

According to National Fire Protection Association’s standard, NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, 2011 Edition, section 11.6.1: “Upon inspection, if the exhaust system is found to be contaminated with deposits from grease-laden vapors, the contaminated portions of the exhaust system shall be cleaned by a properly trained, qualified, and certified person(s) acceptable to the authority having jurisdiction” in accordance with Table 11.4, Schedule of Inspection for Grease Buildup.

An entire exhaust system includes the hood, filters, fan and all associated horizontal and vertical ductwork.

NFPA 96 is a key tool which Fire Marshals and other AHJs should be using to validate the cleanliness of a commercial kitchen exhaust system. NFPA 96 is a standard for ventilation control and fire protection of commercial cooking operations. As a standard, it dates back to 1946 and is constantly reviewed and updated by an accredited body of diverse expert professionals including regulatory and industry stakeholders.

### NFPA Code 96 – Table 11.4 Schedule of Inspection for Grease Buildup

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<thead>
<tr>
<th>Type of Volume of Cooking</th>
<th>Inspection Frequency</th>
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<tbody>
<tr>
<td>Systems serving solid fuel cooking operations. Ex. Wood Burners</td>
<td>Monthly</td>
</tr>
<tr>
<td>Systems serving high-volume cooking operations, such as 24-hour cooking, charbroiling, or wok cooking.</td>
<td>Quarterly</td>
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<tr>
<td>Systems serving moderate-volume cooking operations.</td>
<td>Semiannually</td>
</tr>
<tr>
<td>Systems serving low-volume cooking operations, such as churches, day camps, seasonal businesses, or senior centers.</td>
<td>Annually</td>
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NFPA Code 96 – 11.6.13 – When an exhaust cleaning service is used, a certificate showing the name of the servicing company, date of inspection or cleaning shall be maintained on the premises. Certificate of Performance stickers are usually placed right on the hood; an example is shown below.

If serious inaccessible areas exists in the ductwork, it will be checked off. That means there are sections of the ductwork that are behind finished ceilings or walls and access cannot be gained to properly clean. Documentation is left with the establishment making them aware of the deficiency so that they may correct the problem.

Thank you for giving us this opportunity to start the education process in our commitment to fire prevention and life safety by promoting kitchen exhaust cleaning to a higher standard.