

**FIRE DEPARTMENT • CITY OF NEW YORK**



STUDY MATERIAL  
FOR THE EXAMINATION FOR  
CERTIFICATE OF FITNESS  
FOR

**COMMERCIAL KITCHEN EXHAUST SYSTEM AND  
PRECIPITATOR CLEANING TECHNICIAN**

**F-64/W-64/P-64**

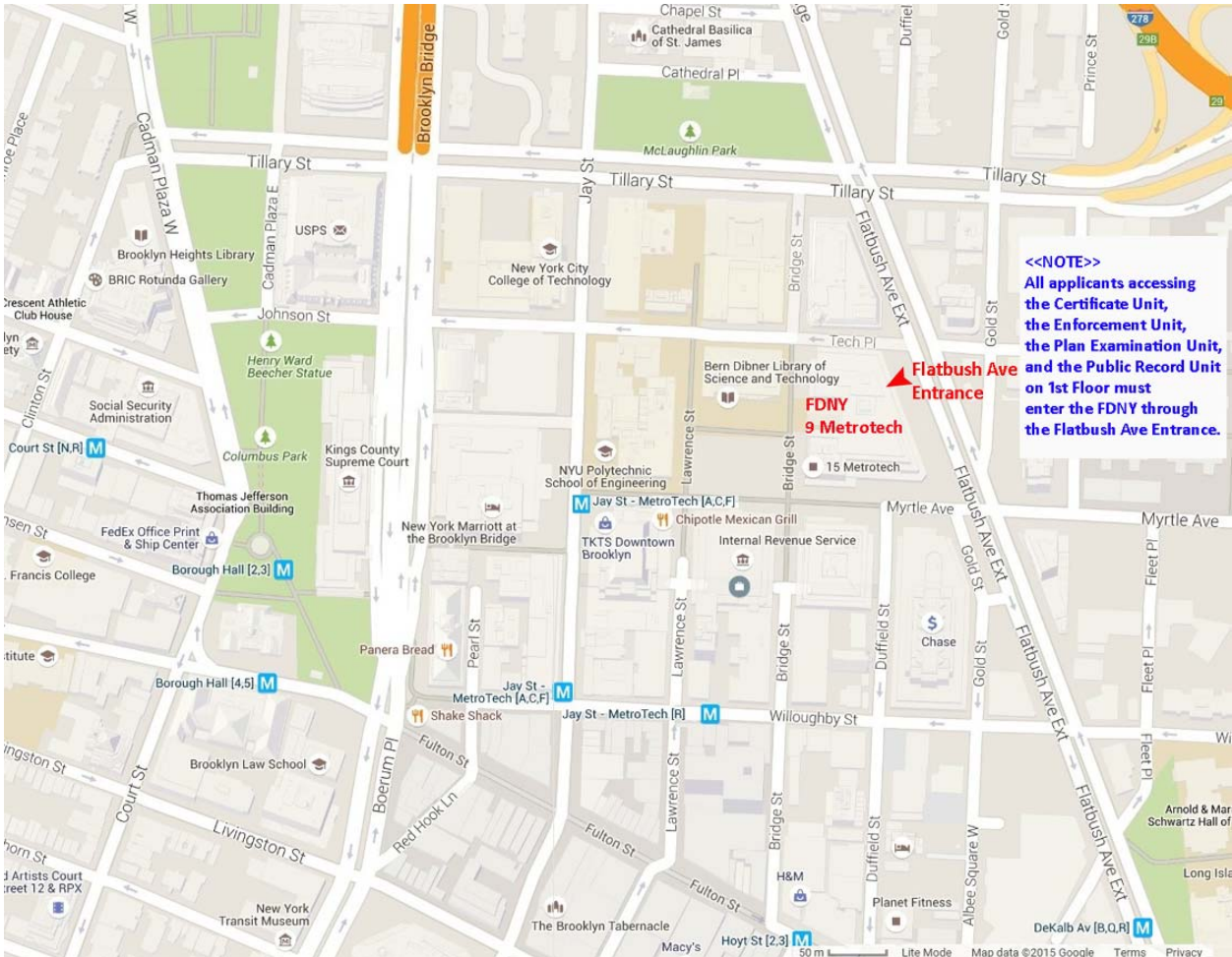
1. **W-64** is for employment with a Commercial Kitchen Exhaust System Cleaning Servicing. This Certificate allows holders to work citywide under the supervision of the owner or principal of a recognized Cleaning Servicing Company.
2. **F-64** is for a company other than a Commercial Kitchen Exhaust System Cleaning Servicing Company. These Certificates are only valid for the employer's location.
3. **P-64** would in addition allow the technician to clean specific type of precipitators. The Certificate has special requirements, allows holders to work citywide and could supersede both the F-64 and the W-64 Certificates.

ALSO INCLUDED IN THIS BOOKLET YOU WILL FIND THE FOLLOWING:  
NOTICE OF EXAMINATION (NOE)

## NOTICE OF EXAMINATION

**Title:** Examination for Certificate of Fitness for F-64/W-64/P-64 – Commercial Kitchen Exhaust System Cleaning Technician

**Date of Test:** Written tests are conducted Monday through Friday (except legal holidays) 8:00 AM to 2:30 PM.



### QUALIFICATION REQUIREMENTS

1. Applicants must be at least 18 years of age.
2. Applicants must have a reasonable understanding of the English language.
3. Applicant must provide two forms of identification; and at least one form of identification must be government issued photo identification, such as a State-issued Driver's License or Non-Driver's License or a passport.
4. Applicants must present a letter of recommendation from his/her employer. The letter must be on official letterhead, and must state the applicant's full name, experience and the address where the applicant will work. If the applicants are self-employed or the principal of the company, they must submit a notarized letter attesting to their qualifications. The sample letters are

available at the link below

[http://www.nyc.gov/html/fdny/html/c\\_of\\_f/cof\\_requirements.shtml](http://www.nyc.gov/html/fdny/html/c_of_f/cof_requirements.shtml) or the Public Certification Unit, 1<sup>st</sup> floor, 9 MetroTech Center, Brooklyn.

5. Applicants who are not currently employed may take the test without the recommendation letter. If the applicants pass the test, FDNY will issue a temporary letter with a picture for job seeking purposes. The C of F card will not be issued unless the applicants are employed and provide the recommendation letter from his/her employer.
6. Applicants seeking a C of F (**W-64**) for employment with a Commercial Kitchen Exhaust System Cleaning Servicing Company must submit a letter signed by the owner or principal of the company. Additionally, the companies must provide \$ 500,000 of liability insurance with the city of New York being co-named on the policy. Until their company is recognized by the FDNY, applicants will receive a **Z-64**. It will be updated, at no cost to the applicants when their company is recognized. This Certificate (**W-64**), allows holders to work citywide under the supervision of the owner or principal of a recognized Cleaning Servicing Company.
7. Applicants seeking a C of F (**F-64**) for a company other than a Commercial Kitchen Exhaust System Cleaning Servicing Company must submit a letter on official letterhead, from the employer, with the applicant's name, which attests to his/her character, physical condition, and experience. Additionally, insurance must be provided for \$ 500,000, with the City of New York being co-named on the policy. Applicants will receive their Certificates of Fitness upon passing the test these Certificates are only valid for the employer's location.
8. An applicant seeking a C of F (**P-64**) for employment with a Commercial Kitchen Exhaust System Cleaning Servicing Company would in addition be allowed to clean specific type of precipitators. These individuals shall demonstrate to the satisfaction of the Fire Department that they possess the training and knowledge necessary to properly inspect, clean and otherwise service the particular precipitators and possess the manufacturer's specifications and servicing manuals for such precipitators. The Certificate of Completion should be submitted prior to taking the P-64 exam.

### **APPLICATION INFORMATION**

**Application Fees:** \$25 for originals and \$15 for renewals. The fee may be paid by cash, money order, credit card, debit card or personal check made payable to the New York City Fire Department. The \$25 fee must be paid by all applicants prior to taking the Certificate of Fitness test.

**Application Forms:** Application forms are available at the Public Certification Unit, 1<sup>st</sup> floor, 9 Metro Tech Center, Brooklyn, NY 11201.

### **RENEWAL REQUIREMENTS**

You will receive a courtesy notice of renewal 90 days before the expiration date. However, it is your responsibility to renew your Certificate. It is very important to renew your C of F before it expires. For renewal, send the renewal notification or a letter stating the C of F # with a fee of \$15, money order or personal check payable to "Fire Department City of New York" to:

FDNY (Cashier's Unit)  
9 MetroTech Center,  
Brooklyn, NY 11201

Late renewals (90 days after the expiration date, up to 1 year) will incur a \$25 penalty in addition to the renewal fee. Certificates expired over one year past expiration date will not be renewed. New tests will be required. FDNY also reserves the right to require the applicants to take a re-examination upon submission of renewal applications.

**TEST INFORMATION**

The W-64/F-64/P-64 test will consist of **50** multiple-choice questions, administered on a "touch screen" computer monitor. It is a time-limit test. A passing score of at least 70% is required in order to secure a Certificate of Fitness. Call (718) 999-1988 for additional information and forms.

**WEBSITE**

Please always check for the latest revised booklet at the FDNY website before you take the test. The Certificate of Fitness Study Material can be found at the link below:

[http://www.nyc.gov/html/fdny/html/c\\_of\\_f/cof\\_study\\_materials.shtml](http://www.nyc.gov/html/fdny/html/c_of_f/cof_study_materials.shtml)

## TEST INFORMATION

**Test:** The test will be of a multiple choice type. Barring any problems, you will take this test on a touch-screen computer. A passing score of at least 70% is required to secure a Certificate of Fitness.

The Study Material provided herein contains the information you will need to prepare for the written examination for the Certificate of Fitness for Citywide Commercial Kitchen Exhaust System and Precipitator Cleaning Technician (F-64/W-64/P-64). The study material includes information taken from NFPA 96, the NYC Mechanical Code sections 506 and 507, NYC Fire Code 904, NYC Fire Rules and NYC Building Code. Other information provided describes the recommended operation, installation, maintenance and cleaning of commercial kitchen exhaust systems. Special thanks are given to IKECA for allowing the FDNY to abstract information from its publications.

You must pass a multiple-choice test to qualify for the Certificate of Fitness. All questions on the Certificate of Fitness exam are multiple choices, with four alternative answers to each question. Only one answer is correct for each question. If you do not answer a question it will be scored as incorrect. A score of 70% correct is required on the examination in order to qualify for the Certificate of Fitness. Read each question carefully before marking your decision. There is no penalty for guessing.

The study materials does not contain all the information you need to know in order to correctly and safely perform the work. It is your responsibility to become familiar with all the rules and regulations of the City of New York, as they apply to this certification, even if they are not covered in this manual.

**SAMPLE QUESTIONS****1. Which of the following are allowed to be used while taking a Certificate of Fitness examination at 9 Metro Tech Center?**

- I. cellular phone
- II. study material booklet
- III. reference material provided by the FDNY
- IV. mp3 player

- A. III only
- B. I, II, and III
- C. II and IV
- D. I only

Only reference material provided by the FDNY is allowed to be used during Certificate of Fitness examinations; therefore, the correct answer would be A. You would touch "A" on the computer terminal screen.

**2. If the screen on your computer terminal freezes during your examination, who should you ask for help?**

- A. the person next to you
- B. the firefighters in the testing room
- C. the examiner in the testing room
- D. the computer help desk

If you have a computer related question, you must ask the examiner in the testing room. Therefore, the correct answer would be C. You would touch "C" on the computer terminal screen.

**3. If you do not know the answer to a question while taking an examination, who should you ask for help?**

- A. the person next to you
- B. the firefighters in the testing room
- C. the examiner in the testing room
- D. it is forbidden to ask anyone regarding test questions

You should not ask about examination questions or answers since FDNY staff cannot assist applicants with test questions. Therefore, the correct answer would be D. You would touch "D" on the computer terminal screen.

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## **DEFINITIONS**

**ACCESS PANEL.** A closure device used to cover an opening into a duct, an enclosure, equipment, or an appurtenance.

**APPROVED.** Acceptable to the authorities having jurisdiction.

**APPURTENANCE.** An accessory or a subordinate part that enables the primary device to perform or improves its intended function.

**CERTIFICATE OF QUALIFICATION.** A written statement issued by the Fire Commissioner certifying that the person to whom it is issued has passed an examination as to his or her qualifications to direct, control and supervise the operation of a refrigerating system, for which such certificate is required by NYC Fire Code and Fire Rules.

**CLEANING.** For kitchen exhaust systems and cooking equipment, the act of removing grease, oil deposits, and other residue.

**CLEANLINESS INSPECTION.** The primary focus of an inspection for cleanliness is to establish whether the volume of grease buildup within the exhaust system warrants cleaning and to determine whether adequate access is available throughout the exhaust system to inspect and remove the grease buildup.

**COMMERCIAL COOKING APPLIANCES.** Appliances used in a commercial food service establishment for heating or cooking food and which produce grease vapors, steam, fumes, smoke or odors that are required to be removed through a local exhaust ventilation system. Such appliances shall or other mobile stands operated by street vendors.

**DUCT SYSTEM.** A continuous passageway for the transmission of air and vapors that, in addition to the containment components themselves, might include duct fittings, dampers, plenums, and/or other items or air handling equipment.

**DUCT TERMINATION.** The final or intended end-portion of a duct system that is designed and functions to fulfill the obligations of the system in a satisfactory manner.

**EASILY ACCESSIBLE.** Within comfortable reach, with limited dependence on mechanical devices, extension, or assistance.



**FILTERS.**

**GREASE FILTER.** A removable component of the grease removal system designed to capture grease and direct it to a safe collection point.

**MESH FILTER.** A filter construction consisting of a net made from intersecting strands with a space between each strand.

**GREASE.** Rendered animal fat, vegetable shortening, and other such oily matter used for the purposes of and resulting from cooking and/or preparing foods.

**GREASETIGHT.** Constructed and performing in such a manner as not to permit the passage of any grease under normal cooking conditions.

**GENERAL SUPERVISION.** Supervision by the holder of any FDNY Certificate of Fitness who is responsible for performing the duties of the certificate holder but need not be personally present on the premises at all times.

**HOOD.** An air-intake device used to capture by entrapment, impingement, adhesion or similar means, grease and similar contaminants before they enter a duct system.

**Type I.** A kitchen hood for collecting and removing grease vapors and smoke.

**Type II.** Kitchen hoods that are designed to exhaust equipment not generating grease-laden vapors, fumes and smoke such as from dishwashers, steamers and general kitchen space and may not require fire protection.

**LIQUIDTIGHT.** Constructed and performing in such a manner as not to permit the passage of any liquid at any temperature.

**PERSONAL PROTECTIVE EQUIPMENT.** In accordance with OSHA, the PPE (personal protective equipment) is required for the kitchen exhaust cleaning and inspection includes, but not limited to the following: eye protection, respiratory protection, hand protection, foot protection, energy protection, fall protection, head protection.

**PERSONAL SUPERVISION.** Supervision by the holder of any FDNY Certificate of Fitness who is required to be personally present on the premises, or other proximate location acceptable to the FDNY, while performing the duties for which the certificate is required.

**PRECIPITATOR.** A precipitator is used to help kitchens and restaurants adhere to stricter air requirements by removing grease particles from the exhaust stream and radically improving the air quality that is being exhausted out-doors.

**SHALL.** Indicates a mandatory requirement.

**SHOULD.** Indicates a recommendation or that which is advised but not required.

**SOLID COOKING FUEL.** Any solid, organic, consumable fuel such as briquettes, mesquite, hardwood, or charcoal.

## **INTRODUCTION**

According to a National Fire Protection Association U.S. Fire Departments responded to an estimated 1,375,000 fires. These fires resulted in 2,855 civilian fire fatalities, 16,500 civilian fire injuries and an estimated \$12,427,000,000 in direct property loss. There was a civilian fire death every 3 hours and 4 minutes and a civilian fire injury every 32 minutes in 2012.

When considering all the possible causes of fire in eating and drinking establishments, the leading cause of restaurant fires occurred by cooking. Grease accumulations were found to be a contributing factor to the expansion of smaller fires into larger fires. When an exhaust system is cleaned regularly the chances of a duct fire become extremely low. According to statistics, the peak time for fires is between 9:00 am and noon. These are the times when food is either prepared or served. Kitchen fires are less common between 9 p.m. and 8:59 a.m., when most establishments are closed. Cooking equipment was responsible in approximately half of the structural fires in eating and drinking establishments.

FOR NEWS STORIES OF ACTUAL FIRES THAT STARTED IN KITCHENS AND SPREAD TO DUCTS SEE APPENDIX B.

Grease removal in kitchen exhaust systems is a continually evolving subject. The key to prevention of fires is a combination of properly designed, installed and maintained exhaust systems coupled with scheduled inspections and preventive maintenance.

Kitchen exhaust cleaning is required by law for all premises with commercial cooking systems; such as restaurants, hospitals, hotels, employee cafeterias and other food-service locations that utilize hoods and ductwork over cooking equipment to exhaust smoke, grease-laden vapors and fumes out of the building. These exhaust gases leave a grease residue on the inside of the ductwork.

Variety of cooking equipment plus different menu selections create differing amounts and types of effluent. Where steam type cooking equipment leaves little to no grease residue, cooking equipment such as from char broilers, woks, grills, fryers, ranges and upright broilers and other grease producing appliances can leave black, hard or rubbery deposits on the hood, in the duct and on the exhaust fan.

Solid fuel cooking uses briquettes, mesquite, hardwood and charcoal which produces large grease laden particles that quickly clog grease filters and leave the dirtiest type of cooking emissions. Propane is not used as a source of fuel in solid fuel cooking. Solid fuel cooking is usually not allowed in commercial

kitchens. The Bureau of Fire Prevention's Rangehood Unit requires additional safeguards and may grant special permission for its use because of the additional fire hazard associated with solid fuel cooking.

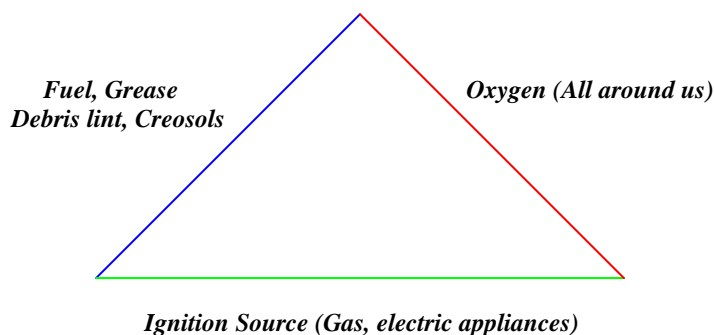
Solid fuel cooking appliances must be serviced by their own independent kitchen exhaust system and not connected with any other exhaust system. Systems of this type produce high levels of heat, grease, ash, creosote and smoke. The buildup of grease, ash and creosote on the filters, hoods, ducts and fan is highly volatile. Once ignited this combination of fuel burns at a high temperature.

**WARNING:** Cleaning could be hazardous because of the presence of electrical components. Before commencement of cleaning prep work, all electrical connections associated with commercial cooking exhaust system must be disconnected or turned off at the main power source. Electrical shock can cause personal injury or death. Only qualified trained Certificate of Fitness holders should conduct or supervise the cleaning of commercial kitchen exhaust systems. All safety codes must be followed. Additionally, all personnel must wear safety glasses, work gloves and other personnel protective equipment (PPE) during cleaning.

An ABC portable fire extinguisher should be made available during cleaning. For a grease fire, type K extinguisher should be used. The use of flame retardant powder to coat interior surfaces of kitchen exhaust systems is prohibited at all times.

When performing duct cleaning, special care shall be taken with regard to personal entering any duct. All OSHA rules and other applicable regulations must be followed to ensure safety.

**Fire Triangle** (If you remove **any** side of the triangle, a fire cannot take place)



According to the FDNY Solid Fuel use must be initially approved by the NYC Department of Buildings.

It shall be **UNLAWFUL** to operate commercial cooking equipment that generates smoke, grease-laden vapors or fumes:

- without a permit for the operation of the commercial cooking system
- without a lawful fire extinguishing system
- without a lawful exhaust system
- without the required grease filters
- while its fire extinguishing system or exhaust system is out of service

The New York City Fire Code prohibits the operation of any exhaust system without approved filters.

## **DESIGN AND INSTALLATION**

Commercial cooking systems shall be designed and constructed in accordance with the construction codes, including the NYC Building Code and the NYC Mechanical Code.

### **3.1 EXHAUST HOODS**

Commercial cooking exhaust hoods shall be designed, installed, operated and maintained in accordance with the construction codes, including the NYC Building Code and the Mechanical Code.

### **3.2 EXHAUST DUCTS**

Commercial cooking exhaust ducts shall be provided with cleanout openings in accordance with Chapter 5 of the NYC Mechanical Code, to allow for cleaning and other maintenance.

Deep fat fryers shall be separated from any adjacent cooking equipment that uses an open flame by at least 16 inches. In lieu of such separation distance, a 16-inch high by 1/8-inch thick steel baffle permanently attached to the longer of the two adjacent cooking appliances may be used. The baffle shall extend to the full depth of the cooking equipment to which it is attached.

### **3.3 HIGH-LIMIT CONTROLS**

Deep fat fryers shall be equipped with an independent high-limit control in addition to the adjustable operating control (thermostat). Such high-limit control shall be designed and arranged to shut-off the fuel supply, including electrical energy, when the fat temperature reaches 475°F, 1 inch below the liquid surface.

### **3.4 SOLID FUEL COOKING**

Cooking equipment burning solid fuel shall only be installed on floors of **noncombustible construction** that extends at least 3 feet from the cooking equipment in all directions. Cooking equipment burning solid fuel shall not be installed within 3 feet horizontally of any combustible surface or construction, or within 6 feet vertically of such surfaces or construction. All solid fuel cooking equipment serviced by hood and duct system shall be separate from all other exhaust systems. Equipment that is used in solid fuel cooking shall be cleaned prior to them becoming heavily contaminated.

### **3.5 EXHAUST SYSTEM COMPONENTS**

A typical kitchen ventilation system (Type I Hood) includes an exhaust hood, ductwork, exhaust fan, a fire system, and the means of providing adequate make-up air.

*The entire system must constitute a fire-safe assembly within the building.*

The basic commercial kitchen exhaust system is composed of the following components:

- A. Exhaust Hoods
  - a. Type I
  - b. Type II
- B. Grease Filtration Systems
- C. Exhaust Duct
- D. Exhaust fan
- E. Make up Air

Auxiliary components as follows:

- F. Fire System
- G. Portable Extinguishers



Carbonized, liquid heavy grease



Light grease



TYPE I HOOD USING BAFFLE FILTERS  
CONVENTIONAL KITCHEN



TYPE I HOOD WASH HAS PLENUM  
DOORS

### 3.5.1 EXHAUST HOODS

Exhaust hoods capture heat, smoke, grease laden vapors and fumes. Filters remove contaminants in the exhaust air. The two types of hoods that can be found in the commercial kitchens are:

- 1) Type I hood
- 2) Type II hood

Solid fuel cooking hoods require spark arrestor type filters.

- **Type I hoods**

At the heart of the kitchen exhaust system, a Type I hood is equipped with grease filtration and extraction devices that include: listed grease filters, and/or extractors for removing the grease. Type I hoods are designed for cooking equipment generating grease-laden vapors, fumes and smoke for which fire protection is required.

Type I Water Wash Hood has plenum doors and a self-cleaning feature. **Note that self-cleaning does NOT mean that mandatory cleaning may be performed than the required once every 3 months.** Type I hoods require externally welded liquid type shell.

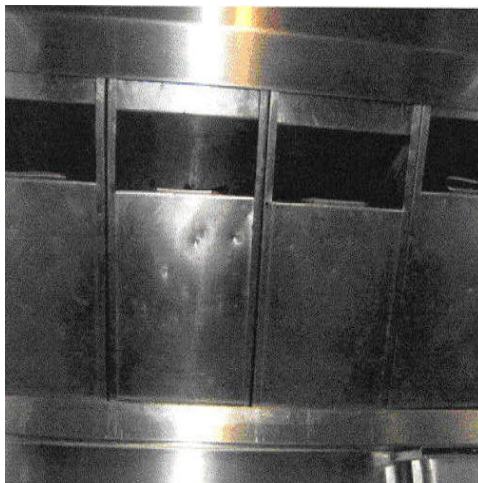


Nozzle installed in a water wash system hood

- **Type II hoods**

Type II hoods are designed to exhaust equipment that does not generate grease-laden vapors, fumes and smoke such as dishwashers, steamers and general kitchen space and may not require fire protection. Type II hoods may or may not have grease filters. Type II hoods **DO NOT** require an externally welded liquid type shell.

**WOOD BURNING OVENS AND GAS FIRED CHARCOAL GRILLS SERVICED BY THE SAME EXHAUST SYSTEM ARE NOT IN COMPLIANCE WITH THE NYC MECHANICAL CODE.**



Cartridge Filter

### **3.5.2 GREASE FILTRATION SYSTEMS**

Grease particles are measured in terms of microns. Grease generated by commercial cooking equipment has a size of 10 microns and more. The grease extraction efficiency of the exhaust hood and filters plays a key role in the removal of grease particles before they reach smoke and odor control equipment.

Types of grease filters and extractors that fit



into the hood and are in use today include: the **baffle filter**, and **dry-cartridge filter**.

Newly developed baffle filters have larger surface areas than their predecessors. They have a series of vertical baffles designed to capture grease that would be drained into a container. Each hood usually has one or more baffle filter(s) which are typically constructed of galvanized or stainless steel and come in various sizes.

All baffle filters must be installed with the baffles running vertically so the grease can drain downward and out of the weep holes. Notice that all baffle filters should have weep holes in the bottom of the filter so grease can drain into a drip tray or cup. Filter drip trays and cups should be monitored by the food service operator and emptied frequently.

Some filters are not baffle type, instead they are part of a listed and approved grease extractor hood assembly as found in water wash hoods and other pre-fabricated hoods. These filters, though different in appearance, provide the same level of grease removal as found in baffle type grease filters. Extra care should be taken when handling these filters for cleaning as they must be returned to their original positions.



Filters are required to be installed over cooking equipment, such as, but not limited to ranges, fryers, griddles, broilers, and ovens that produce smoke or grease-laden vapors. Filters shall be installed at an angle not less than 45 degrees, with the exception of those filters associated with listed grease extractor hood assemblies. Filters should not be secured to anything and



shall be easily attached so they can be easily removed for cleaning.

**Note: No exhaust system shall operate without filters installed while cooking.**

Supplemental multi-stage filtration units employ a combination of filters which are part of a listed component. In addition, there are Electrostatic Precipitators (ESP) which are also used to remove grease and smoke from the air being exhausted to the outside.

Filters, grease extractors and other filtration devices located in the hood area are the first line of defense since they capture grease particulates being exhausted in the very beginning. Approved grease filters are commonly described as baffle type grease filters and cartridge filters. Listed water wash hoods are the exception and are part of the manufacturer's listing for their hood. All baffle grease filters should be approved by the MEA, or COA or shall bear the NYC BSA (Board of Standards and Approvals) approval stamp.

**Note: Mesh or mesh type grease filters are ONLY permitted for use as part of a listed device. Mesh filters in Type I hood without solid fuel shall be removed from service and replaced with baffle filters.**

#### **A. ULTRA-VIOLET (UV) LIGHTS**

Ultra-violet (UV) lights are also being incorporated into new hood designs. UV lighting breaks down grease molecules into smaller harmless compounds of carbon dioxide and water vapor, which are carried out with the exhaust airflow.

This new added filtration device (UV lighting) is electrically charged and must be handled with caution before cleaning can commence. It may be necessary to consult with an authorized representative of the UV lighting system since special tools are required for the removal of the lights.

These systems must be maintained by a trained kitchen exhaust professionals who have F-64/W-64/P-64 Certificates of Fitness, and in accordance with the manufacturers' specifications.

#### **B. WATER WASH EXHAUST SYSTEM**

A water wash exhaust system has fixed baffles that are non-removable and are washed in place with a fixed hot water and detergent spray. Full length inspection panels provide access to the grease extraction chambers. They have fire dampers at the exhaust duct collar or at the inlet to the extraction chamber. Dampers in kitchen exhaust systems may only be acceptable when they are part of a listed grease extractor.

### C. PRECIPITATOR AND POLLUTION CONTROL DEVICES

**Air quality** is a major concern in New York City. As a result, many commercial kitchens require pollution control equipment to be installed in their exhaust systems. Pollution control equipment is not limited to removing smoke particles, but also in removing the majority of the grease particles from the exhaust stream.

The Precipitators and/or Pollution Control devices are designed to reduce grease and/or odors. Removing grease/smoke from the exhaust stream allows the odor control component of the system to work more efficiently. Once the exhaust has been processed by the precipitator/pollution control unit (PCU) it is exhausted to the outdoor environment. Their operating status may not be fully indicated by lights, gauges and other devices. **NO PERSON SHOULD SERVICE OR MAINTAIN THESE UNITS WITHOUT PROPER TRAINING FROM MANUFACTURERS ACCEPTABLE TO THE FDNY.** It should be the responsibility of employers to ensure that their staff is properly trained and has a valid C of F.

Factory authorized technicians must maintain and clean precipitators and other pollution control equipment. **The technicians must have a F-64/W-64 C of F to perform these maintenance functions.** Precipitators are essential components of kitchen exhaust systems and shall be cleaned at least once **every 3 months (MONTHLY for solid fuel cooking operations).**

Precipitators must be powered off and the electrical charges held by the individual cells must be drained before any cleaning begins as to prevent personal injury. Cleaning shall include the housing and all internal components, with the exception of the fire system. When the service is completed on the precipitator unit the Certificate of Fitness holder must replace all filters in the correct order for the unit to operate according to its listing.

#### **3.5.3 EXHAUST DUCTS**

An exhaust duct system removes cooking vapors, grease, fumes and smoke to the outside of the building.

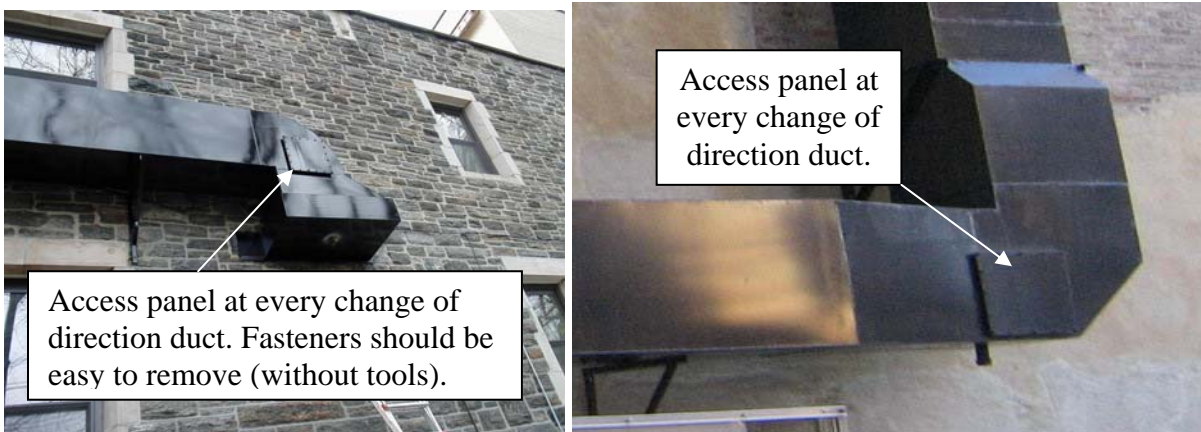
Additional grease and odor removal devices such as from precipitators, and other approved pollution control devices may be a part of, and thus considered a part of the exhaust duct system.

#### **Properly designed and installed ducts consist of the following:**

1. The entire duct system shall be made liquid tight by means of a continuous external weld so as to prevent leakage.  
**Exception:** UL listed prefabricated duct systems approved by FDNY and/or NYC Department of Buildings.

The use of a high-heat-silicone sealant on the grease ducts is PROHIBITED.

2. All interior ductwork must be properly insulated with approved and listed materials approved by the NYC Department of Buildings.  
**Exception:** Listed prefabricated duct systems approved by FDNY and/or NYC Department of Buildings.
3. Duct systems serving type I hoods shall be constructed and installed so that the grease cannot collect in any portion of the system.  
**THERE IS ONE EXCEPTION:** Exhaust ducts used in down draft appliance ventilation systems shall be allowed to include an upturn in the duct provided the trapped area contains a low point drain to an approved grease reservoir not exceeding 3.8 L in capacity. The entire length of duct must be easily accessible for cleaning. The exhaust duct must be pitched towards its origin.
4. Ducts shall be provided with access panels installed at 12-foot intervals and at every change of direction as to provide access into the duct for cleaning and/or inspection. Access panels can be found on the sides or on top of the ductwork. Access panels should have a gasket that is rated for a minimum of 1500 degrees Fahrenheit.
5. Access panels shall be provided with proper signage at each opening reading; “ACCESS PANELS – DO NOT OBSTRUCT”, this also includes access to the ceiling. After service they shall be closed by the COF holder.



All kitchen exhaust system access doors must be secured with fasteners that can be removed by hand. When closing an access door on a kitchen exhaust duct that is designed for use with wingnuts, a Certificate of Fitness holder shall replace all wingnuts holding the door in place.

**3.5.4 EXHAUST FANS**

Exhaust fans shall be UL listed for the removal of grease-laden vapors from commercial cooking equipment. In-line exhaust fans are permitted providing they are UL listed for such use and that the motor or any electrical components of the fan are not located inside the air stream.

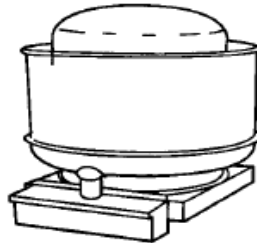
When cleaning a commercial kitchen exhaust fan, the power must be shut-off and the switch should be locked out and tagged. To prevent roof damage, roof mounted fans should be provided with a collection pan to properly drain grease collected at the roof level. Exhaust fans with ductwork connected to both sides shall have access for cleaning and inspection within 3 feet of each side of the fan.



Upblast Fan

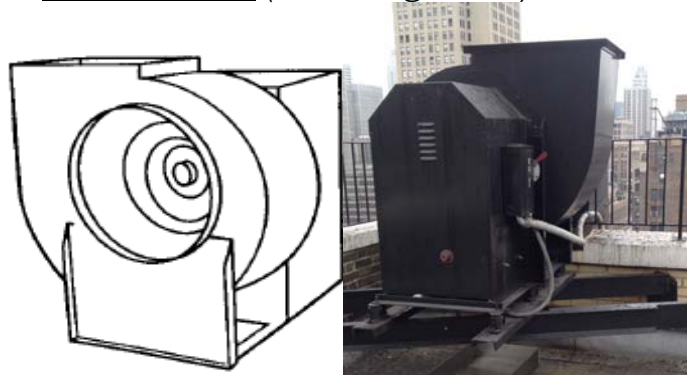
Common types of exhaust fans found in-use (all use centrifugal wheels with backward inclined blades):

**UP BLAST FANS** (power roof ventilator)

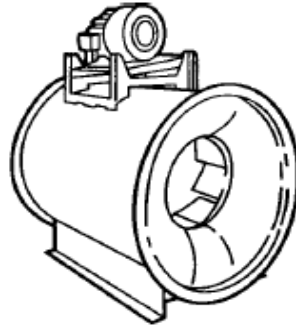


Up-blast fan shall be hinged and supplied with a flexible weatherproof electrical cable to permit inspection and cleaning. They must also be supplied with a service hold open retainer.

**UTILITY SET** (Centrifugal Fan)



Listed for grease exhaust application with an access door and drain coupler.

**INLINE FANS** (tubular centrifugal)

An exhaust fan unit must be installed in accordance with the manufacturer's terms and listing. Access doors must be installed within 3 feet of the intake and the exhaust side of the fan.

**3.5.5 Make-up Air**

Make-up air is used to increase the efficiency of the exhaust system and its ability to exhaust all by products of cooking.

**3.5.6 Fire Alarm System**

Components of the fire extinguishing system shall not be altered or turned off during the cleaning process. If electrical switches, detection devices, or other components of the fire extinguishing system must be deactivated during the cleaning process, such deactivation shall be performed by a licensed Master Fire Suppression Piping Contractor. Immediately upon completion of the cleaning process the licensed Master Fire Suppression Piping Contractor shall restore the system to proper operation.

Cleaning fluids shall not be applied on fusible links or other detection devices of the fire extinguishing system. Electrical switches that may be accidentally activated during the cleaning process shall be electrically locked out during such a process.

### 3.5.7 Portable Extinguishers

At least one “K Class” portable fire extinguisher shall be provided at each cooking location. A placard shall be conspicuously placed near the extinguisher that states that the fire

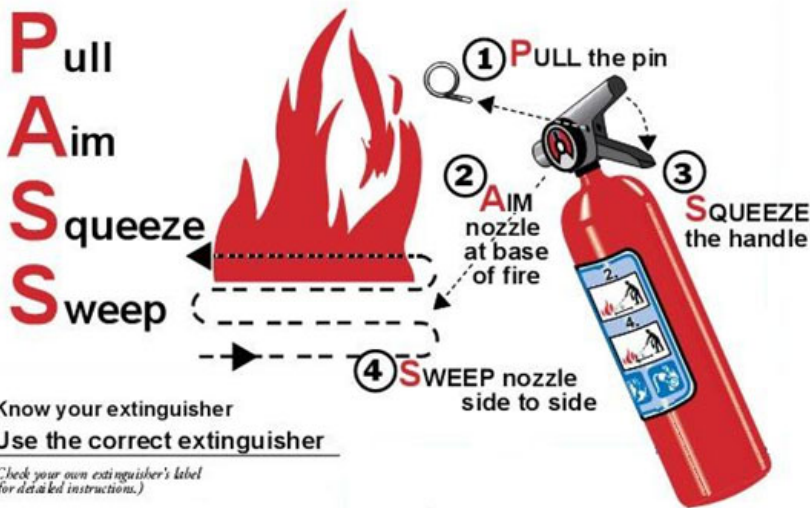
**CLASS K FIRES**



protection system shall be activated prior to using the fire extinguisher. Other extinguishers **may be** needed for class A or B fires. **An ABC portable fire extinguisher should be readily available during the**

**cleaning process to ensure safety.**

To operate an extinguisher:



## GREASE REMOVAL IN COMMERCIAL KITCHEN SYSTEMS

### **4.1 CLEANING METHODOLOGIES**

When an exhaust system is properly cleaned, the chances of a fire are reduced. All components of the exhaust system shall be cleaned to bare metal and no powder or other foreign substance shall remain in the exhaust system after cleaning.

The entire exhaust system, including but not limited to hoods, filters, grease removal devices, ducts, fan pollution control devices and other appurtenances, shall be inspected and cleaned at least once every three months by a person(s) holding a F-64/W-64/P-64 Certificate of Fitness. **THE EXCEPTION TO THIS RULE IS VERTICAL EXHAUST DUCTS, MORE THAN 3 STORIES HIGH, WHICH MUST BE CLEANED EVERY SIX MONTHS.**

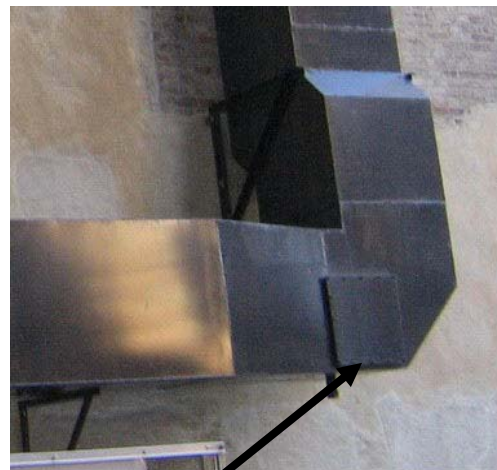
Common methods of cleaning commercial kitchen exhaust systems are:

- **Scraping**
- **Pressure Washing**
- **Steam Cleaning**

**1. SCRAPING** is a manual method requiring the use of hand tools such as wire brushes, chisels, hand scrapers as well as steel wool. When properly done, this method is extremely effective.

**2. PRESSURE WASHING** is a cleaning method requiring various nozzles, plastic sheeting, high pressure warm/hot water, and the means to control wash/waste water.

**3. STEAM CLEANING** is a cleaning method requiring various nozzles, plastic sheeting, and low pressure steam, and the means to control wash/waste water.



Shop fabricated  
cleanout door



A drain coupler is used to remove water and grease while pressure washing the exhaust ducts.

A COMBINATION OF METHODS CAN BE USED FOR THOROUGH CLEANING.

When performing cleaning by means of a pressure washer and cleaning chemical, a Certificate of Fitness holder should collect all the waste water. It must be properly disposed of before it enters a sanitary line or a storm drain. Water waste should be discarded into a sink connected to a grease trap. Grease trap waste is then collected and is disposed of by a NYC permitted company.



Grease Collector Box

Baffle filter holes shall face outward to allow grease to flow freely as shown in the grease collector box photo above.

A service report following a cleaning job should be completed after each kitchen exhaust system service. If a problem is noticed while performing the work at a site, the COF holder should indicate it on the service report. The COF holder should notify the supervisor or the owner of the company. The holder should **NOT** attempt to make repairs.

#### **4.2 CLEANING FILTERS**

Filters should be cleaned **daily** by a trained employee of the restaurant owner, but shall be cleaned **monthly** by a person holding a F-64/W-64/P-64 COF whether employed by a citywide company or the restaurant owner.

#### **4.3 SIGNAGE**

A sign clearly and concisely summarizing the operation, maintenance and cleaning requirements for commercial cooking systems shall be available on the premises. Such a sign shall be at least 8½ inches by 11 inches in size, posted at or near the main entrance to the cooking area, and laminated or framed under a clear glass or plexiglas cover.

**4.4 CLEANING:** The cooking exhaust system shall be cleaned at least once every three months, or as frequently as necessary to maintain system free of grease accumulations. High volume cooking equipment such as from solid fuel burning appliances, char broilers, woks, fryers, upright broilers and some 24-hour restaurants may require more frequent cleaning and inspection. Systems should be cleaned by a person holding a F-64/W-64/P-64 Certificate of Fitness issued by the Fire Department. A record of inspection and cleaning of an exhaust system shall be maintained on the premises and upon request made available for inspection to any representative of the FDNY.

- It shall be **unlawful** for anyone to inspect or clean any commercial cooking exhaust system without a valid Certificate of Fitness.
- The Certificate of Fitness holder and/or the principal of the citywide cleaning company are required to notify the FDNY - Rangehood Unit of any hazardous conditions found at the premises.
- A Certificate of Compliance label (**white background with black lettering**) shall bear the Certificate of Fitness number of the company performing such cleaning and shall be placed on the hood with the date of cleaning while a non-compliance service label (**yellow background with black lettering**) must be posted for those systems which are non-compliant. Certificate of Fitness holder shall be responsible for alerting FDNY and restaurant owner/operators of the status of their systems. These referenced label colors are those acceptable to the FDNY.

#### **4.5 GREASE REMOVAL**

Grease collected from the exhaust system should be disposed of properly. **It is the responsibility of the restaurant owner.** Stored grease is a fire hazard and may produce noxious odors. Disposal of grease into the NYC sewer system is prohibited.

**Typical Problems:** Some of the most common conditions found in poorly designed, constructed and operated grease exhaust systems:

- Duct construction is less than the required 16-gauge steel to 12-gauge black iron.
- Exhaust duct is un-welded and not liquid tight.
- Exhaust hood is un-welded and not liquid tight.
- Access panels are obstructed or improperly installed.
- Sections of the ductwork are inaccessible.
- Clearance to combustible material is inadequate.
- Grease filters are not installed properly or are missing.
- Filters installed at an angle less than 45 degrees.
- Hoods are installed improperly and don't capture and contain grease-laden vapors, fumes and smoke.
- Ductwork and grease drainage are improperly sloped.

**Note:** Any report of deficiencies may be accompanied by photographs.

#### **4.6 COMPANY CERTIFICATION**

It shall be **UNLAWFUL** for any person engaged in the business of inspecting and cleaning commercial cooking exhaust systems as required by the provisions of NYC Fire Code to perform such service without a commercial cooking exhaust system servicing company certificate.

Companies performing commercial cooking exhaust cleaning must be certified by the FDNY. There are numerous qualifying requirements which appear on the application form. The form will be available on the FDNY website [WWW.NYC.GOV/FDNY](http://WWW.NYC.GOV/FDNY) or person at 9 Metro Tech Center, Brooklyn, NY 11201.

#### **4.7 IN CASE OF A FIRE:**

- Call 911
- Do not shutdown the blower.
- Operate the fire system manual pull station.
- Call the Fire Department.
- Evacuate the entire commercial cooking establishment.
- Be prepared to provide information to arriving FDNY unit.
- Stand by to extinguish the fire with a K-class portable fire extinguisher should the re-ignition occur.

## **IMPORTANT INFORMATION TO BE PROVIDED TO KITCHEN OPERATORS**

### **5.1 EXHAUST SYSTEMS:**

- A FDNY permit is required to maintain and operate all commercial cooking operations which may include cooking exhaust systems.
- **OPERATION DURING COOKING:** Exhaust systems shall be operated at all times while cooking equipment is in use. The ventilation system exhaust shall be operating at the required rate of air movement, and approved grease filters shall be in place when equipment under the exhaust hood is in use.
- **MAINTENANCE OF OPERATIONAL EFFICIENCY:** Fixed air supply openings installed to provide make-up air for air exhausted through the exhaust system shall not be restricted by covers, dampers, or any other means that would reduce the operating efficiency of the exhaust system. Commercial cooking hoods shall NOT be painted.
- **UNLAWFUL OPERATION.** It shall be unlawful to operate commercial cooking equipment that generates smoke or grease-laden vapors or fumes: without the required grease filters.
- **EXHAUST SYSTEM INSPECTION AND CLEANING.** The entire exhaust system, including exhaust hoods, grease filters, grease extractors, ducts, exhaust fans, pollution control devices, and other appurtenances, shall be inspected and cleaned at least once every 3 months by a person holding a Certificate of Fitness. Flammable cleaning fluids shall not be used. Cleaning fluids shall not be applied to fusible links or other detection devices of the fire extinguishing system.
- **Exceptions:**
  1. Commercial cooking equipment utilizing solid fuel shall be inspected **monthly** by a trained and knowledgeable person, and cleaned by a Certificate of Fitness holder as necessary, but not less frequently than once every 3 months.
  2. Vertical portions of interior and exterior vertical ducts in excess of three stories in height shall be cleaned at least **every 6 months** by a person holding a Certificate of Fitness. Horizontal portions of such ducts, including all elbows, shall be inspected and cleaned in accordance with this section.

**COF HOLDER IS NOT REQUIRED TO CLEAN THE COOKING APPLIANCES.**

- **SYSTEM DEACTIVATION.** Unless necessary to accomplish cleaning, components of the fire extinguishing system shall not be rendered inoperable during the cleaning process. If electrical switches, detection devices, or other components of the fire extinguishing system must be deactivated during the cleaning process, such deactivation shall be performed by a licensed master fire suppression piping contractor.

Immediately upon completion of the cleaning process the licensed master fire suppression piping contractor shall restore the system to proper operation. Electrical switches that may be accidentally activated during the cleaning process shall be electrically locked out during such process. After applying a lockout device to a kitchen exhaust, or fan power switch, the Certificate of Fitness holder should attempt to restart the fan to ensure a proper shutdown.

- Vertical risers over 3 stories in height must be cleaned 2 times per year by a person holding a Certificate of Fitness issued by the FDNY.
- Surfaces shall be cleaned to bare metal. The powder residue or other foreign substance left by saponifying agents or other cleaning materials shall be removed.
- **GREASE FILTERS.** Grease filters shall be regularly cleaned or replaced by a trained and knowledgeable person, as necessary but at least once per month.
- All service and maintenance (except for daily cleaning) on a cooking exhaust system shall be performed by a person or persons holding a personal Certificate of Fitness working for a company holding a company Certificate of Fitness.
- Commercial cooking equipment shall be attended at all times when it is in operation.
- Cleaning and operating instructions and a schematic drawing or sketch of the cooking exhaust system must be permanently posted in a picture frame or glass at a suitable entrance to the cooking area on 8 ½” by 11” in size.

## **5.2 FIRE SYSTEMS:**

- **MAINTENANCE.** At least once a month, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor, properly trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and otherwise maintain such system in accordance with the manufacturer’s specifications and servicing manuals at least on a semiannual basis. Tests shall include a check of the detection system, alarms and releasing devices, including manual stations and other associated equipment. Extinguishing agent containers shall be weighed to verify the required amount of agent. Stored pressure-type units shall be checked for the required pressure. The cartridge of cartridge-operated units shall be weighed and replaced at intervals specified by the manufacturer.
- **UNLAWFUL OPERATION.** It shall be unlawful to operate commercial cooking equipment that generates smoke or grease-laden vapors or fumes while its fire extinguishing system or exhaust system is out-of-service.

- Portable fire extinguishers shall be readily available for use in the cooking area but, in any event, no further than 30 feet of travel distance from the commercial cooking equipment.
- At least one K-class portable fire extinguisher must be placed in the cooking area.
- At least **once a month**, an inspection shall be conducted by a trained and knowledgeable person to assess whether the system is in good working order.

### **5.3 APPLIANCES:**

- **HIGH-LIMIT CONTROLS.** Deep fat fryers shall be equipped with an **independent high-limit control** in addition to the **adjustable operating control (thermostat)**. Such high-limit control shall be designed and arranged to shut-off the fuel supply, including electrical energy, when the fat fryers temperature reaches 475°F, 1 inch below the liquid surface.
- **HIGH-LIMIT CONTROLS FOR DEEP FAT FRYERS.** All high-limit controls shall be replaced every 3 years with a new or rebuilt unit certified to operate at up-to 475°F.

### **5.4 STAFF TRAINING:**

- The owner or operator of commercial cooking equipment shall train all staff in the proper procedure for the use of all components of the grease removal system, cleaning of filters, and the manual operation of the fire extinguishing system.
- At least once every 6 months the owner or operator of the premises shall review with all kitchen staff the manual operation of the fire extinguishing system.

## 5.5 CHECKLIST

The purpose of the **FDNY CHECKLIST** is to ensure that standardized processes are followed at all times by Certificate of Fitness holders. Many of the steps are commonly known by technicians but relying simply on memory can lead to significant errors or forgotten steps. The checklist also allows the Certificate of Fitness holders to document their actions at the work site. After the completion of the CHECKLIST, one Certificate of Fitness holder must sign the final report. After the cleaning it is important to ensure that the kitchen is left not just clean but with all appliances back in working order and in their proper positions. Pilot lights must be turned back on (pilot lights must be shut off before cleaning begins).

**ALL ITEMS ON THE CHECKLIST SHOULD BE COMPLETED**

The **N/A** appears when the answer is non-applicable. On the back of the checklist, there is **space for additional comments**.

Citywide companies, restaurants, and all Certificate of Fitness holders **must** complete this FDNY Checklist. If any items have an **(M-Mandatory)**, they have high safety importance. The FDNY should be notified immediately if any of these items are checked by the Certificate of Fitness holder. This is an important responsibility since public safety may be jeopardized by unreported serious hazards since fires can easily occur and then spread.

The Citywide companies, restaurants, and all Certificate of Fitness holders are responsible to send an original report **within 72 hours to the restaurant owner or his designated authorized person**. Any problems must be documented and be made available for inspection by the premises owner and any Fire Department representative. Many cleanings are done in the early morning or late at night so it might be difficult to find the appropriate person. In those cases, a copy of the report should be sent on its own or with the invoice to the appropriate party. The actual checklist is in this study material.

**Applicants should know the checklist contents since it must be performed while performing their duties.**

\*Restaurant name, address and phone number are essential elements that should be included in the checklist.

### Check List

Re: Business name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City & State: \_\_\_\_\_  
 Phone: \_\_\_\_\_

Company Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City, ST, Zip Code \_\_\_\_\_  
 CO Certification # \_\_\_\_\_

Date: \_\_\_\_\_  
 Technician Name: \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 C of F #: \_\_\_\_\_ Exp. Date: \_\_\_\_\_  
 Time in: \_\_\_\_\_  
 Time out: \_\_\_\_\_

A. Are the Filters cleaned by your Company?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	If different, C of F # _____ of the persons who cleaned it. Exp Date: _____
B. Are there filters missing / damaged? M	<input type="checkbox"/> Yes <input type="checkbox"/> No	If Yes, number of filters missing or damaged: # _____
C. Are the precipitators/pollution control devices cleaned by your company?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	If different, C of F # _____ of the persons who cleaned it Exp Date: _____
<b>D. <u>Pre-Cleaning check</u></b>	<b><u>Responses</u></b>	<b><u>Comments</u></b>
1. Do Fan(s) operate? M	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Unable to determine.
2. What is the grease load in exhaust System?	<input type="checkbox"/> Light <input type="checkbox"/> Med <input type="checkbox"/> Heavy	
3. Have appliances been disconnected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4. Has the building representative or alarm company been notified?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Name: _____ <input type="checkbox"/> Not Available
5. Have all power sources for Kitchen Exhaust Fans been locked out and tagged out?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6. Schematic sketch/ drawings & cleaning operating instructions posted?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7. Describe the grease load under the protective hood(s)?	<input type="checkbox"/> Light <input type="checkbox"/> Med <input type="checkbox"/> Heavy	
8. Last quarterly service cleaning date?	____/____ /____	CO. NAME _____ <input type="checkbox"/> Not Available
<b>E. <u>Area to be serviced</u></b>		
9. How many grease exhaust hoods are there & how many of them cleaned?	# Of hoods _____ # Cleaned _____	
10. Were hood light(s) cleaned?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A
11. Were exhaust Fan(s) cleaned & hinged?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
12. Has exhaust fan louvers been cleaned & checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A
13. Has exhaust fan belts & pulleys been inspected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
14. Were grease cup(s) cleaned?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
15. Are there any visible grease leaks from the duct system? M	<input type="checkbox"/> Yes <input type="checkbox"/> No	<u>Location</u>
16. Has horizontal duct(s) been cleaned? M	<input type="checkbox"/> Yes <input type="checkbox"/> No	If no, explain reasons on back of page in comments section.
17. Has vertical duct(s) been cleaned? M	<input type="checkbox"/> Yes <input type="checkbox"/> No	If no, explain reasons on back of page in comments section.
18. Are access panels provided? M	<input type="checkbox"/> Yes <input type="checkbox"/> No	No. Of panels installed _____ / Size of panels _____
19. Do access panel have proper	<input type="checkbox"/> Yes <input type="checkbox"/> No	



signage?		
<b>F. Post -Cleaning Check</b>		
<b>20.</b> Has technician left working area free of grease rags & debris?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>21.</b> Are there any inaccessible areas? M	<input type="checkbox"/> Yes <input type="checkbox"/> No	If Yes, explain reasons on back of page in comments section.
<b>22.</b> Has compliance certificate been dated & placed on hood?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If No, Refer to additional post service report
<b>23.</b> Have appliance(s) been reconnected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>24.</b> Any problems found? M	<input type="checkbox"/> Yes <input type="checkbox"/> No	If Yes, explain reasons on back of page in comments section.
<b>25.</b> Are there any electrical wires in the hood, ducts or fans? M	<input type="checkbox"/> Yes <input type="checkbox"/> No	If Yes, explain reasons on back of page in comments section.
<b>26.</b> Has a photo been taken before & after?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> N/A
<b>Owner representative name:</b> _____ <b>Signature</b> _____ <b>Date:</b> _____ (For the follow up letter)		

**M** – Mandatory, Any **NO** answer on M items requires immediate notification to the FDNY, Rangehood Unit.

**N/A** – Not applicable

*Note: A record of this service shall be maintained on premise and be made available for inspection by any member of the New York City Fire Department.*

*For any deficiencies described above, a follow-up letter will be sent to you listing any corrective action necessary. It is your responsibility to maintain your equipment in good working order.*

**Additional Comments:**

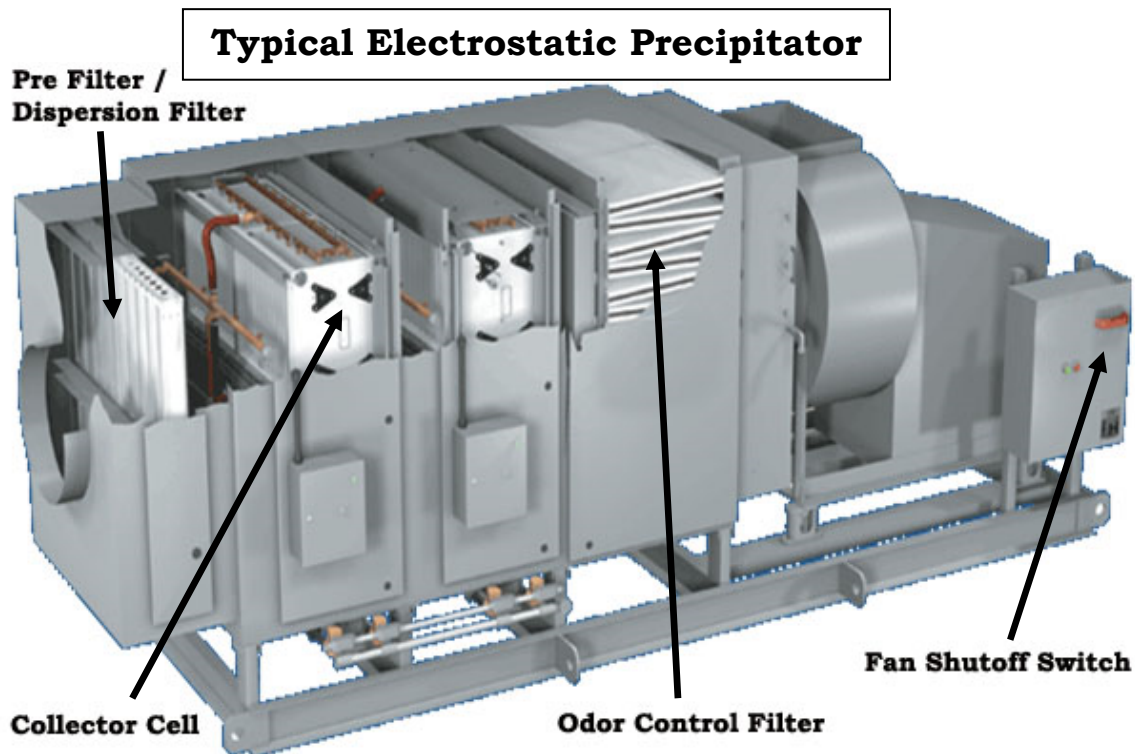
Section / Item #	Description of Deficiencies

## Precipitators

This section sets forth standards, requirements and procedures for issuance of P-64 Certificates of Fitness to inspect and clean commercial cooking exhaust systems.

Applicants who intend to inspect and clean the precipitator component of commercial cooking exhaust systems shall obtain an endorsement on his/her *Certificate of Fitness* for **each type** of precipitator to be serviced.

In addition to the qualifications set forth in this study material applicants shall possess and demonstrate to the satisfaction of the Fire Department that they possess the training and knowledge necessary to properly inspect and clean the particular precipitators that they intend to service; and possess the manufacturer's specifications and servicing manuals for such precipitators. Precipitators shall be cleaned or inspected at a minimum of every 90 days. Odor control filters are an added option; therefore, not all precipitators come with them. Electrostatic precipitator cells are reusable.



### Electrostatic Precipitator

The purpose of an electrostatic precipitator is to help kitchens and restaurants adhere to stricter air requirements by removing grease particles from the exhaust stream and radically improving the air quality that is being exhausted outdoors.

## APPENDIX A

### MECHANICAL CODE – CHAPTER 5

**504.3 Cleanout.** Each vertical riser shall be provided with a means for cleanout.

**506.3.8** Grease duct systems shall not have openings therein other than those required for proper operation and maintenance of the system. Any portion of such system having sections not provided with access from the duct entry or discharge shall be provided with cleanout openings. Cleanout openings shall be provided at every change in direction, within 3 feet of the exhaust fan, and as required under Section **506.3.9** Cleanout openings shall be equipped with tight-fitting doors constructed of steel having a thickness not less than that required for the duct. Doors shall be equipped with a substantial method of latching, sufficient to hold the door tightly closed. Doors shall be designed so that they are operable without the use of a tool. Door assemblies shall have a gasket or sealant that is noncombustible and liquid tight, and shall not have fasteners that penetrate the duct. Listed and labeled access door assemblies shall be installed in accordance with the terms of the listing. Signage shall be provided at all required access doors and openings in accordance with Section 506.3.11.

**506.3.8.1 Personnel entry.** Where ductwork is large enough to allow entry of personnel, not less than one approved or listed opening having dimensions not less than 20 inches by 20 inches shall be provided in the horizontal sections, and in the top of vertical risers. Where such entry is provided, the duct and its supports shall be capable of supporting the additional load and the cleanouts specified in Section 506.3.8 are not required. Where personnel entry is not possible, access for cleaning interior vertical ducts shall be provided on each floor, and for cleaning the base of the vertical riser.

**506.3.9 Grease duct horizontal cleanouts.** Cleanouts located on horizontal sections of ducts shall be spaced not more than 20 feet apart, unless the opening prescribed by Section 506.3.8.1 is not possible, in which case openings large enough to permit thorough cleaning shall be provided at 12 feet intervals. The cleanouts shall be located on the side of the duct with the opening not less than 1.5 inches above the bottom of the duct, and not less than 1 inch (25 mm) below the top of the duct. The opening minimum dimensions shall be 12 inches (305 mm) on each side. Where the dimensions of the side of the duct prohibit the cleanout installation prescribed herein, the openings shall be on the top of the duct or the bottom of the duct. Where located on the top of the duct, the opening edges shall be a minimum of 1 inch from the edges of the duct. Where located in the bottom of the duct, cleanout openings shall be designed to provide internal damming around the opening,

shall be provided with gasketing to preclude grease leakage, shall provide for drainage of grease down the duct around the dam, and shall be approved for the application. Where the dimensions of the sides, top or bottom of the duct preclude the installation of the prescribed minimum-size cleanout opening, the cleanout shall be located on the duct face that affords the largest opening dimension and shall be installed with the opening edges at the prescribed distances from the duct edges as previously set forth in this section.

## APPENDIX B

### FIRE SUMMARY

**Location: Harlem, NY**

**Date: June 13, 2014**

### Businesses Reeling Following Harlem Restaurant Fire

The future of several Harlem businesses destroyed in a fire remains uncertain.

A fire broke out inside Mama's Fried Chicken on Frederick Douglass Boulevard and 155th Street just before 7 p.m. Friday.

The flames quickly spread through the building and nearby businesses, including a deli and a Chinese restaurant.



NY1 spoke to the owner of the fried chicken restaurant, who says it was hard to see his business being destroyed.

"All of my store is damaged. I am trying to do some reacting to open again. Of course, no one can lose their own business," said Mama's Fried Chicken owner Edem Khan.

The fire also affected apartments above the businesses. A FDNY chief on scene said 33 units and 138 firefighters responded to the scene.

The FDNY chief said duct work helped spread the fire.

Six firefighters and a DEP worker suffered minor injuries, according to a FDNY chief on scene.

The Red Cross says it's helping one family in need of temporary housing.

The cause of the fire is under investigation.

### Lessons Learned:

- Periodic mandatory duct cleaning should be conducted as required.
- Commercial kitchen exhaust cleaning Certificate of Fitness holders must be properly trained.
- Kitchen staff should pay more attention while working at the kitchen.

**FIRE SUMMARY****Location: Lake Zurich, IL****Date: June 11, 2014****No injuries, minor damage in Lake Zurich restaurant fire.**

No one was injured and minimal damage was caused by a fire Tuesday at Rics Dog-Gone Good Food in Lake Zurich, Fire Chief David Wheelock said.

No employees or customers were inside when a fire broke out at the restaurant, which sits in a strip mall at 670 E. Route 22, Wheelock said. No adjacent businesses were damaged, he said.

Lake Zurich police and fire officials responded to the fire at 9:30 p.m. after a neighboring business reported seeing smoke rising inside of Rics, which was closed for the day, Wheelock said.

Just minutes after their arrival, fire personnel could see the fire moving toward the kitchen in the back of the building and forced their way in, using an extinguisher and hose to put it out, he said.

A burner on a grill inside the restaurant had been left on and likely began to burn up excess grease, causing the heavy smoke and ultimately a growing fire, Wheelock said.

Damage to the inside of the building was not extensive, but will require “a lot of cleanup” and a re-inspection by the Lake County Health Department before the business can open again, he said.

“Any time we have smoke or a fire in a building that deals with food, we have to make a call to the Health Department because they have to re-inspect the place before it’s allowed to re-open,” Wheelock said.

Fires like the June 10 blaze aren’t rare, he said.

“We have these occasionally in restaurants where a stove is left on and it takes a while for a fire to build up,” Wheelock said.

**Lessons Learned:**

- K fire extinguisher should be made available for grease fires.
- Employees have be cautious and check surrounding premises prior to leaving work.
- Lack of fire prevention devices in the shelter increases the probability of fatal fires.

**FIRE SUMMARY****Location: NYC, NY****Date: June 6, 2014****Three-Alarm Fire at Midtown TGI Fridays.**

A fire broke out in a TGI Friday's restaurant in midtown Manhattan last night. The FDNY says the fire started in the basement of 604 5th Avenue at 48th Street, where the kitchen is, just before 9 p.m. Friday. Then, as WCBS 2 reports, "Flames and smoke raced to the top of the building through the duct work."

According to NBC New York, "There appeared to be some sort of malfunction while crews were working on a duct in the basement, and a fire was sparked, quickly shooting through the duct up to the roof, where it spread to a connecting duct in the building next door."

**Lessons Learned:**

- Excess of grease presents a fire hazard; duct work should be properly inspected to make sure no grease exists.
- Scraping, Pressure Washing, Steam Cleaning or combination of such should be completed on quarterly bases.
- Nearby storage should be checked to make sure no flammable material is left unattended.